Request for Proposal to assist IFPRI in AgPile PoC and MVP implementation from Jan – Dec 2025

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A. What we are seeking

As more specifically described below, IFPRI seeks the services of individuals, an organization or consortium of individuals and/or organizations to assist CGIAR in the Global AI Ready Solution for Agriculture Research Collaboration and Sharing (AgPile) Proof of Concept (PoC) of technical solutions in use, and Minimum Viable Product (MVP) for research programs operated, by its Centers selected to participate in PoC/MVP implementation phase of the AgPile.

B. Background

CGIAR is undergoing digital transformation to accelerate the collaboration in agriculture research within and between its Centers, as well as with external partners and collaborators in government, academia and the private sector.

Food, land, and water systems need a profound transformation – one in which CGIAR can and must play a central role. CGIAR has a remarkable 50-year track record of working with partners to translate groundbreaking agricultural research into tangible development outcomes on the ground. In the 21st century, CGIAR faces a different set of more complex and more interconnected challenges, evolving faster than before. Climate change, biodiversity loss, conflicts, catastrophic weather events, transborder plant disease and pest spread, and pandemic are just some examples of global threats that are inextricably linked with an unsustainable food system; and they pose immediate risks to our ability to end hunger and achieve or safeguard key development outcomes. Ultimately, CGIAR needs to completely transform our food, land, and water systems to nourish a growing population, without risking the stability of the natural processes that sustain our existence.

In the face of these momentous challenges, CGIAR's offer to the world is more relevant than ever. To maximize our added value given the pace, scale, and complexity of the challenges we face – CGIAR's Centers need to come together as 'One CGIAR'. One CGIAR is based on the premise that CGIAR's excellent leaders, scientists, and staff can deliver more when brought together under fewer institutional boundaries, supported by more unified systems, services, management, and governance. In addition, One CGIAR's needs to lead the mobilization of the community of researchers and solution developers outside of CGIAR to accelerate the translation of research into actionable solutions for small-scale producers and support them to optimize agriculture productivity and address environmental challenge to agriculture.

AgPile will be the anchor solution to accelerate the One CGIAR vision of collaboration and sharing within CGIAR and opening up CGIAR assets to attract global collaboration, sharing, and commitments to achieve holistic results.

C. Purpose

In 2025, IFPRI, as the management entity of AgPile, has been funded to transform CGIAR's digital assets to enable better collaboration and sharing within the agriculture research community across the globe given the interconnectedness of the different research domains and the similarities in needs across different geographies.

The AgPile implementation would focus on the following:

- **PoC**

    1. Confirm the technical and operational feasibility of the federated AI-ready solution architecture designed for AgPile

    2. Identify and address potential risks early in the implementation effort to avoid issues later

    3. Demonstrate potential value and benefits of the approach to achieving support and commitment from users and collaborators

    4. Determine the resources and effort required for MVP implementation

    5. Validate demand for AgPile and gather feedback to ensure the achievement of the needs of users and collaborators.

- **MVP**

    1. Confirm the collaboration and sharing needs for the use cases selected

    2. Gather valuable insights from early users and collaborators of AgPile

    3. Validate the core features and capabilities needed to solve critical functional and non-functional requirements needed to promote collaboration and sharing on the use cases selected

    4. Enable rapid-to-market for the AgPile to attract attention from relevant users and collaborators

    5. Confirm guidelines for contributions and skills required of users and collaborators, including partners and funders in the Public and Private sectors.

D. Audience

The AgPile PoC and MVP will target:

- CGIAR research programs and projects: Research programs and projects within the CGIAR, starting with those projects bilaterally funded by the Gates Foundation.
- CGIAR partners: Research and scientific communities, technology and systems integration partners.
- Current and potential private sector partners.

- Global influences in the global agriculture and research sector, including academic institutions and agriculture industry professional groups.

E. Project details

i. AgPile Proof of Concept

- Duration: The AgPile PoC will take place over 3 months, starting in February 2025.
- Scope: The 3-month proof-of-concept will include:
    a. Evaluation of existing infrastructure at selected locations.
    b. Determination of configuration changes and additional technical resources needed to support the federation tests identified.
    c. Deployment of a prototype digital asset registry to aggregate REST APIs for the selected assets for the PoC.
    d. Demonstration of federated access and distributed execution of processes as needed.
    e. Demonstration of the ability to foster processing of asset , without transferring and downloading the asset, and creating duplicates of the asset that would complicate their maintenance.
    f. Demonstrate the ability to enable the integration of publicly available agricultural content, repositories, multimedia, etc. into processing pipeline as needed.
    g. Demonstrate the scope of federation and distributed processing possible with the different solution options available.
    h. Establish guidelines for participation in the AgPile for asset contributors into the Digital Public Good.
- Solution candidates: The solution candidates for the PoC have been carefully selected based on the existing solutions within the CGIAR. These solutions were adopted independently by the different research programs, either based on the solution that was explicitly funded by the research program or based on a requirement by a technical partner on the project. Many of these assets have been released to the public domain, but are challenged by findability, accessibility, interoperability and reuse beyond the primary research program and the primary purpose for which they were created. For example, the Artemis project has an extensive image repository that is only available to its computer vision research programs, while there are many digital plant phenotyping research projects that would benefit from this asset, both within CGIAR and outside CGIAR, such as University of Saskatchewan's Plant Phenotyping and Image Research Center, Hiphen Plant Phenotyping Platform, Boyce Thompson Institute of Plant Phenotyping Facility to name a few. The solution candidates are as follows.

Table 1. PoC Solution Candidates

Solution candidate	Reason for inclusion	Specific capability to be validated
Google's Dataplex Asset Catalog	GCP is one of the cloud platforms in use at CGIAR, especially for the Alliance of Bioversity & CIAT's digital phenotyping / computer vison research programs – Artemis and Tumaini	GCP's serverless process capability to share resources and federate execution to cloud/hybrid-cloud solutions on other cloud vendor implementations.
AWS asset catalog	AWS being used extensively within CGIAR, especially by CGIAR breeding programs for the Enterprise Breeding System (EBS), Breedbase	AWS ability to share resources and federate execution to cloud/hybrid-cloud solutions on other cloud vendor implementations.
Azure Purview asset catalog	Azure being in use by CGIAR breeding scientists in Bioflow, which integrates data from multiple breeding systems, as well as with CG360 which supports a few research projects	Azure purview's ability to share resources and federate execution to cloud/hybrid-cloud solutions on other cloud vendor implementations.
Databricks Unity Catalog	PaaS in the process of being adopted by projects	Resource sharing and federated execution capability across on-prem and cloud resources
WatsonX asset catalog	PaaS used in a demo project for 1000 Farms, which was very well received by the project team and the larger CGIAR community	Resource sharing and federated execution capability across on-prem and cloud resources
GARDIAN asset catalog	Custom PaaS in-house asset catalog developed to support the Excellence in Agronomy program	Performance and scaling verification for its resource sharing and federated execution ability, including needs for custom extensions

- Deliverables: The deliverables from the PoC will be code, reports, and demonstration on the different vendor solution of the following capabilities.
    a. Federated access and indexing of *banana images* in Colombia, Vietnam, 1-3 other country local image stores of DRC, Uganda, Ethiopia, Benin, India

b. Federated access and indexing of *beans images* in image stores in 3-5 countries where Artemis research program is active of Kenya, Uganda, Ethiopia, Nigeria, India, Columbia.
c. *Distributed/near-real time automated annotation and labelling of images* at the point of capture or within the image source file for the *banana and beans image stores.*
d. *Federated management of anonymized household data for 3-5 countries that* overlap the selection for the federated banana and bean image processing of Ethiopia, Uganda, Kenya, Nigeria, Colombia, India among others.

- Duration of assignment: PoC will be time-boxed to 3 months.
  a. **Stage 1** – Confirmation of solution capabilities -- Mapping of PoC use cases / test cases to the solution candidates, ranking of solution candidate, determine top 1-2 solutions for Phase 2.
  b. **Stage 2** – Execution of PoC with top 1-2 solutions identified, execution of test cases, creation of report for final selection of solution candidate(s).

- Qualifications and experience to support the PoC:
  a. Experience with deployment and configuration of the vendor asset catalog for the different solution options that have elected to participate.
  b. Ability to create and validate technical specifications needed to configure existing assets for remote access and federated execution.
  c. Experience with creating and deploying the workspaces, procedures/templates needed to implement the configuration specified, preferably platform agnostic solution like terraform.
  d. Experience with agile PoC with the test cases based on capabilities listed above.
  e. Experience supporting in-house researchers and technical leaders with demonstrations to facilitate the final decision of the solution selection.

ii. AgPile Minimum Viable Product

- Duration: The AgPile MVP will take place over 9 months, immediately following the PoC.
- Scope: The 9-month minimum viable product will include:
  a. Harvesting, curation, and labeling of images on banana for CV model development.
  b. Harvesting, curation, and labeling of images on beans for CV model development.
  c. Federating datasets that combine pedigrees, historical breeding data, on farm data, and environmental data (soil maps, weather maps, climate maps), and variety preference data.
  d. Federating dataset for selected agronomy modeling and decision support use case such as spatial yield simulations with DSSAT, GSSAT2, Fertilizer optimization, etc.
  e. *Search* functionality, at a minimum a Google-style search for data assets with

natural language or prompt-like query (similar to ChatGPT). Ease of findability is critical to the adoption and incentives for using AgPile.

    f. Creation of tools and templates to accelerate the setup and control of access and the curation of assets, to implement the established guidelines defined for sharing and collaboration with the assets.

- User story candidates: These user story candidates to be validated by the research programs teams selected for the MVP. Please note that the user story, asset type, and asset demonstration requirements may be different from those highlighted here. The different program teams may decide on other user stories, as long as it can be modularized for the 9-month timeline of the MVP.

Table 2. MVP User Story Candidates

MVP work package	User Story candidate	Asset type	Asset Demonstration
Harvesting, curation, and labeling of images on banana for CV model development	Indexing banana image sources available for CV modeling	Banana image discovery workflow	Banana image location map for model development
	Automated processing and prep of images at the location, if needed, for CV modeling	Banana image processing and labeling workflow	Filter for data source by reuse classification
	Curating banana images for CV modeling	Catalog / Registry of images suitable for different model training tasks	Filter for images by type of model
	Banana image segmentation and part classification model	Tagging images based on the part of the plant	Add overlay to isolate images for specific plant parts or whole plant
	Variety identification models	Tagging images based on variety on the image	Add overlay to display banana variety distribution
	Banana health modeling	Tagging images based on state of health or disease	Add overlay based on banana health status

	Banana disease identification	Tagging images based on	Adding disease types to the display
	Banana yield performance modeling	Estimating yield for the images	Adding yield statistics
	Banana yield loss modeling	Estimating potential loss based on the extent of disease or pest affliction	Adding loss statistics
Harvesting, curation, and labeling of images on beans for CV model development	Indexing beans image sources available for CV modeling	Beans image discovery workflow	Beans image location map for model development
	Automated processing and prep of images at the location, if needed, for CV modeling	Beans image processing and labeling workflow	Filter for data source by reuse classification
	Curating beans images for CV modeling	Catalog / Registry of images suitable for different model training tasks	Filter for images by type of model
	Beans image segmentation and part classification model	Tagging images based on the part of the plant	Add overlay to isolate images for specific plant parts or whole plant
	Variety identification models	Tagging images based on variety on the image	Add overlay to display beans variety distribution
	Beans health modeling	Tagging images based on state of health or disease	Add overlay based on beans health status
	Beans disease identification	Tagging images based on	Adding disease types to the display
	Beans yield performance modeling	Estimating yield for the images	Adding yield statistics

	Beans yield loss modeling	Estimating potential loss based on the extent of disease or pest affliction	Adding loss statistics
Federating datasets that combine pedigrees, historical breeding data, on farm data, and environmental data (soil maps, weather maps, climate maps), and variety preference data.	Curating breeding and on-farm datasets available	Curated datasets by location, crop, variety, etc.	Curated breeding dataset location map for ML/AI modeling
	Blending curated breeding and on-farm data with overlay of curated breeding and on-farm data on soil maps	Curated breeding datasets overlay on soil maps	Visualization of curated breeding datasets on soil maps, highlighting data gaps
	Adding overlay of weather maps	Curated breeding datasets on soil maps with overlay of weather maps	Visualization of curated breeding datasets on weather , highlighting data gaps
	Adding overlay of climate maps	Curated breeding datasets with soil, weather, and climate overlays	Visualization of curated breeding datasets, soil, weather, climate overlays, highlighting data gaps
	Adding overlay of variety preference data	Curated breeding datasets overlay on soil, weather, climate maps with a variety preference data	Visualization of curated breeding datasets on soil maps, highlighting data gaps
Federated management of anonymized household data	Selected crop yield analytics for households in countries with adequate data	Crop yield models at HH level by country and crop	Exploration of crop yield dashboard for famine zones and potential food deserts
	Market analysis for households in selected	Market models at HH level by country, by crop	Market status of crops in different countries, to

	crop and countries with data		identify shortage and affordability zones
	Resource allocation analysis at the HH level for selected crops and countries for which data is available	Resource allocation models at the HH level	Resource allocation and distribution at HH level to identify gaps in resource distribution
	Gender impact policy analysis in selected crop and countries with adequate data	Gender impact models at HH level	Gender impact at HH level to identify zone for accelerated gender programming

- Deliverables: The deliverables from the MVP will be digital assets that can be used by other researchers to advance research in the different research domains as well as assets needed for progressive funding of agriculture research, such as
  a. Banana image registry and banana image exploration tool for CV researchers, possibly with estimators of disease and pest impact, yields, losses and other decision support factors
  b. Bean image registry and banana image exploration tool for CV researchers, possibly with estimators of disease and pest impact, yields, losses and other decision support factors,
  c. Breeding program performance maps for priority crops and countries
  d. Household data related decision support tools for crop yield, market analysis, resource allocation, gender impact, climate impact etc.
- Duration of assignment: MVP will be limited to 9 months. At the end of this period, it is expected that there will be 2-4 compelling demonstrations of the value of AgPile to the global agriculture research, agriculture extension work, agriculture digital solution development, policy makers, and students.
- Qualifications and experience to support the MVP:
  a. Experience with infrastructure engineering work on needed to extend the AgPile asset registry from the prototype used for PoC.
  b. Experience with transformation of selected digital assets into FAIR implementation with FAIR point for access to shared digital objects.
  c. Experience with creation of the semantics needed to make digital object machine readable.
  d. Experience with creating templates brokers that can be called to execute processes on the FAIR point as needed.

e. Experience with agriculture data and ontology.

f. Experience with FAIR transformation of content catalogs like Dataverse, CKAN, DKAN, Figshare, or Denodo.

g. Experience with harvesting integrating content from open repositories with agricultural data and related content.

h. Experience supporting agriculture researchers in the demonstration of digital capabilities to audience and stakeholders.

F. Required proposal content

Each response to this request should include the following:

I. Technical Proposal

1. Proposed solution: This section should demonstrate the Bidder's responsiveness to the RFP by identifying the specific components proposed, addressing the requirements as specified, point by point; and should also include any other value-adding services that were not indicated in the RFP but that the bidder may wish to offer CGIAR.

2. Details of the proposed methodology.

3. Implementation plan: The bidder shall describe the plan of action including project plan outlining the timeline of all responsibilities, critical path; action items indicating party responsible for implementation (i.e., bidder or CGIAR); resource requirement and any other critical item for implementation and period required to commence the services.

4. Experience and capability: Provide at three sample projects of a similar nature and three references from past clients of the project examples provided, including telephone and e-mail contact information.

5. Management plan: Provide a comprehensive and complete general management approach towards the project that clearly provides a practical approach and includes the following:

   i. Quality assurance and control including risk management process

   ii. Details of disaster recovery and business continuity management.

6. Proposed teams: Names, experience and skills of designated staff regarding the following qualifications:

   i. Provide detailed information of the lead person, and other members, including relevant skills and experience, suitability for the assignment and CVs (attach as appendix).

   ii. Outline the precise role that each of the team members will fulfill in the assignment.

      iii.   Information on the diversity and inclusion program(s) of the firm itself.

II. Financial proposal

1. A breakdown of the cost for each task/deliverable, with the applicable rates.
2. Identification of any task to be subcontracted (if any), showing number of subcontractor hours and their hourly rates where applicable.
3. Indicative expenses and the basis of calculation.

III. Relevant disclosures information

- A statement disclosing whether the proposed team members have any real, apparent or perceived conflict of interest and how it will be addressed.
- If relevant, state potential conflict of interest mitigation measures.

IFPRI reserves the right to determine in its absolute discretion whether any proposal meets the minimum standards of a complete proposal, and whether to approach an applicant to provide additional information. No discussion on the relative merits of any application will be entered into between IFPRI and any applicant before, during or after contract award.

G. Evaluation criteria

Proposals will be evaluated based on the following dimensions.

- Technical Proposal (80%)
    - The quality and relevance of the firm's proposal according to the criteria set out in part E and F above.
- Financial proposal (20%)
    - The currency of bid is USD.
    - Maximum funding limit is USD 1,500,000, with preference given to applicants that can provide best value for money
    - Provide a general table summarizing pricing including any applicable discounts.
    - The selection will be based on the technical quality and financial proposal.
    - Award shall be made to the bidder receiving the highest final technical evaluation score (above 70%) and ranked no.1 and with whom satisfactory price and terms can be negotiated and agreed.

All proposals will be evaluated on a 2-step basis with the engagement approach and engagement cost parts each being evaluated separately to determine best value for price.

Applicants whose proposals have been short-listed by IFPRI in its absolute discretion may be contacted with questions for clarification during the evaluation process. The basis of the IFPRI's decision making will remain in confidence and internal to IFPRI.

H. Award of Contract

IFPRI will award the contract to the qualified bidder whose proposal, after being evaluated by CGIAR, is the most competitive and appropriate.

I. Language

The review and all correspondence and documents exchanged will be in English.

J. How to Submit a Proposal

Please submit a narrative proposal and a budget proposal as two separate documents to Jawoo Koo (jkoo@cgiar.org), copying Bishal Aryal (b.aryal@cgiar.org), on or before midnight (EST), February 28, 2025. Both documents can be attached to the same email.

Narrative proposals will consist of no more than 10 pages using Microsoft Word or similar format, Arial font size 11pt., margins no smaller than one inch.

K. Schedule and Dates

The following schedule provides key events and their associated completion dates and is provided primarily for planning purposes. IFPRI may modify the project timeline at its discretion.

Table 3. Indicative timelines and milestones

Indicative Timelines	Milestone
15 Jan 2025	Issue RFP
30 Jan 2025	End of inquiry period for RFP clarification (bidder)
28 Feb 2025	Deadline for submission of proposals
10 Mar 2025	Interviews for shortlisted firms
20 Mar 2025	Firm selected and informed by IFPRI
31 Mar 2025	Agreement with selected firm signed

The precise nature and extent of the activity involved – and related terms - will be subject to agreement between CGIAR and the selected firm. A copy of IFPRI's Standard Agreement for Services will be provided upon request.