



Evaluation of CGIAR Platform for Big Data in Agriculture: Inception Report

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Table of Acronyms

CapDev	Capacity Development
CAS	CGIAR Advisory Services Secretariat
CIAT	International Center for Tropical Agriculture
CoP	Community of Practice
CRPs	CGIAR Research Programs
CSO	Civil Society Organization
DC	CGIAR Research Program on Dryland Cereals
FAIR	Findability, accessibility, interoperability, and reusability
FAO	Food and Agriculture Organization
FGDs	Focus Group Discussions
FISH	CGIAR Research Program on Fish
GARDIAN	Global Agriculture Research Data Innovation Acceleration Network
GIZ	Gesellschaft für Internationale Zusammenarbeit
GODAN	Global Open Data Initiative for Agriculture and Nutrition
IAB	International Advisory Board
IDO	Intermediate Development Outcome
IEA	CGIAR Independent Evaluation Arrangement
IFPRI	International Food Policy Research Institute
KIIs	Key Informant Interviews
ISDC	Independent Science for Development Council
M&E	Monitoring and Evaluation
MEL	Monitoring, Evaluation, and Learning
MELIA	Monitoring, Evaluation, Learning, and Impact Assessment
NGO	Nongovernmental Organization
NARES	National Research and Agriculture and Extension Systems
OECD	Organization for Economic Co-operation and Development
Platform	Platform for Big Data in Agriculture
PCU	Project Coordination Unit
SIMEC	Strategic Impact, Monitoring and Evaluation Committee
SLO	System-Level Outcome
SME	Subject Matter Expert
SO	CGIAR System Office
SPIA	Standing Panel on Impact Assessment
ToR	Terms of Reference
USAID	United States Agency for International Development

1 Introduction

1.1 Rationale and Background¹

In today's connected, data-rich world, big data presents tangible benefits and challenges revolutionizing the Agricultural Research for Development (AR4D) continuum as well as people's lives. The smart and effective use of data is key to unlocking and accelerating the achievement of the 2030 Agenda for Sustainable Development. Data innovations and digital tools bring critical capabilities for agile adaptation in food systems.

CGIAR's data and knowledge products should be, arguably, among its crown assets. To stay at the cutting-edge of the rapidly evolving digital world, the CGIAR invests in the curation and maintenance of these assets through a five-year (2017-21) CGIAR Platform for Big Data in Agriculture (hereinafter, the Platform) approved by the System Council. The Platform is a coordinating mechanism to deliver a coherent data-driven and data-intensive strategy leveraging data capabilities and infrastructure. Its strategy focuses on collaboration among CGIAR Research Programs (CRPs) and Centers, leveraging external expertise to enable unrestricted discoverability of linked open datasets. *"The ultimate goal of the Platform is to harness the capabilities of Big Data to accelerate and enhance the impact of international agricultural research. It will support CGIAR's mission by creating an enabling environment where data are expertly managed and used effectively to strengthen delivery on CGIAR Strategy and Results Framework (SRF)'s System Level Outcome (SLO) targets."*²

The CGIAR Advisory Services Shared Secretariat (CAS Secretariat) supports and facilitates the CGIAR's independent advisory services, comprising the Independent Science for Development Council (ISDC), the Standing Panel on Impact Assessment (SPIA) and an independent Evaluation Function. CAS Secretariat's Evaluation Function supports the implementation of the CGIAR System multi-year evaluation plan to meet CGIAR System's needs for rigorous high-quality independent evaluations to inform decision making across the System. As part of its 2021 approved workplan and budget, the Evaluation Function is mandated to conduct an external evaluation of CGIAR's Big Data in Agriculture Platform.

Earlier in the year, per its mandate and approved workplan, to meet the needs of System Council represented by Strategic Impact, Monitoring and Evaluation Committee (SIMEC) On June 21, 2021, the Evaluation Function completed the [Synthesis of Learning from a Decade of CGIAR Research Programs](#) (CRPs). The high-level 2021 Synthesis pooled evidence from 43 CGIAR evaluations, reviews, syntheses, and assessments including the 2019 performance management standards pilot assessment for the Platform commissioned by CAS Secretariat and conducted by Dalberg Advisors on behalf of the CGIAR System. Against this backdrop, the recent [2021 Synthesis of Learning from a Decade of CGIAR Research Programs](#) brought to the fore thematic evidence gaps related to digital innovations revealing limitations on the evaluative evidence available on digital innovations.

There has been hitherto no comprehensive independent process evaluation of the Platform in its entirety.

An evaluative study related to the Big Data Platform was commissioned by CAS Secretariat's predecessor, CGIAR's Independent Evaluation Arrangement in 2018, a review of CGIAR's open access/open data policy and implementation support.

In addition to the aforementioned evaluative assessments, since its inception in 2017, the Platform has been the subject of several other reviews and studies, worthy of mention.

- In response to CGIAR System Management Board's request for a digital strategy that identified CGIAR's comparative advantage relating to big data³, a strategic research study was conducted on digital transformation in food, land, and water systems in a climate crisis⁴ in support of the [2030 Research and Innovation Strategy](#);

¹ This section was excerpted from the Platform ToR

² Big Data Coordination Platform: Full Proposal 2017-2020

³ Chair's Summary, 13th CGIAR System Management Board ('SMB') Meeting. Approved May 3, 2019

⁴ <https://cgspace.cgiar.org/handle/10568/113555>

- Also, in 2021, a review of the Inspire Challenge, assessed the Platform’s Inspire Challenge program (2017-20) and its broader contributions to catalyze partnerships and digital agricultural innovations.
- A [Strategic research on digital transformation](#) was also conducted by the Platform and released in March 2021.

Making the digital revolution central to the way of working is one of the seven new implementation approaches prioritized in the 2030 strategy (seventh way of working). The key elements of the 2030 strategy’s seventh way of working include engagement with partners in developing cutting-edge, context-appropriate digital solutions, improved access to and use of data and digital innovations targeting small-scale farmers, pursuing new digital applications to accelerate learning and knowledge sharing among partners underpinned by principles of findability, accessibility, interoperability, and reusability (FAIR) for all CGIAR data. Thus, leveraging the unprecedented opportunity provided by today’s digital revolution is at the front burner of One CGIAR to accelerate progress towards the achievement of the Sustainable Development Goals (SDGs).

Against this backdrop, the recent [2021 Synthesis of Learning from a Decade of CGIAR Research Programs](#) brought to the fore thematic evidence gaps related to digital innovations revealing limitations on the evaluative evidence available on digital innovations. There has been hitherto no comprehensive independent evaluation of the Platform in its entirety. In response to the request of CGIAR System Council and informed by the evaluative evidence needs identified in the synthesis, and, the Evaluation Function under CAS Secretariat seeks to commission an evaluation of the Platform. The evaluation would assess the Platform’s effectiveness, design, and delivery and distil lessons and recommend actionable operational and strategic approaches for the future One CGIAR.

1.2 Purpose and structure of the Inception Report

The inception report sets out the conceptual framework of the Platform evaluation, it provides methodological and operational information about the evaluation design and implementation building on the evaluation Terms of Reference (TOR) after a review of relevant documents.

The inception report summarizes the background and rationale of the Platform evaluation in four sections. Section 1 gives an overview of the Platform impact pathways, structure, governance and management arrangements, funding and budget, progress towards outputs and stakeholders’ mapping. Section 2 presents the evaluation objectives and questions as laid out in the evaluation Terms of Reference (ToR). This is followed by a description of the evaluation approach, methodology, phases and data collection methods in section 3. Section 4, the final section, presents the evaluation work plan, milestones, and management. Annexes are an important part of the report, including but not limited to, a presentation of the preliminary results of the desk review as well as the evaluation matrix and a list of stakeholders.

1.3 Overview of CGIAR Platform for Big Data in Agriculture

1.3.1 Platform Purpose and Objectives

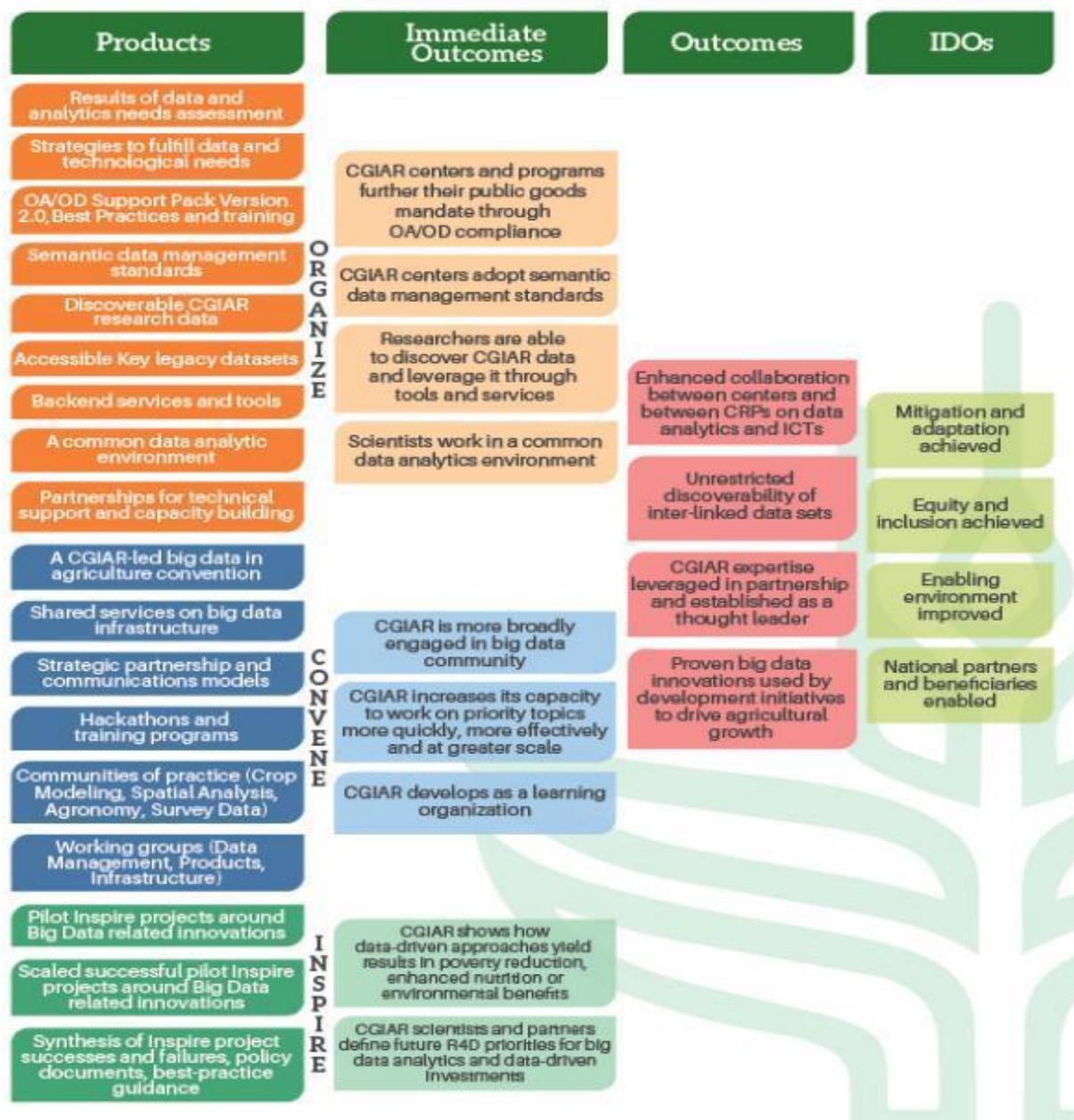
According to the final July 2016 Proposal “*the Big Data Platform focuses on enhancing CGIAR and partner capacity to deliver big data management, analytics and [Information and Communications Technology] ICT-focused solutions to CGIAR target geographies and communities through its ambitious partnerships with both upstream and downstream partners. In addition to developing new partnership models with big data leaders at the global level, the Platform seeks to promote CGIAR-wide collaboration across CRPs and Centers.*”

1.3.2 Platform Initial Impact Pathways

In the 2016 Proposal CGIAR defines “big data as harmonized, interoperable, and contextually integrated datasets and publications from multiple disciplines relevant for CGIAR’s research and development goals (CGIAR Consortium 2015a)”. The applications of insights gained from the study of such integrated datasets are greatly advancing knowledge and impact in several fields, including the -omics, biomedical, and ecological domains (Kitchin, 2014; Madin et al., 2008; Jin et al., 2015). The technical definition of big data varies across disciplines, but is generally characterized as having high volume, velocity, variety, and variability (Laney, 2001).

The Platform aims to increase the impact of agricultural development by embracing big data and ICT approaches to **solve development problems faster, better and at greater scale**. As outlined in the SRF, this will initially be across CGIAR but will be extensible to agriculture at large. The theory of change of the Platform focuses on increasing the capacity of CGIAR and partners to embrace big data and ICT approaches as shown in Figure 1.

Figure 1: Initial Impact Pathways for the Big Data in Agriculture⁵



In the 2016 proposal, the authors acknowledge that the primary **assumption** of this theory of change (TOC) is that data are a valued commodity for development that can be harnessed to deliver growth in agriculture in developing countries. It also assumes that CGIAR and its partners can identify business

⁵ Source: CIAT and IFPRI (2016). CGIAR Big data coordination platform. Proposal to the CGIAR Fund Council, 31 March 2016. International Center for Tropical Agriculture (CIAT), Cali, Colombia and International Food Policy Research Institute, Washington DC, United States of America.

opportunities where rural institutions are weak, to deliver benefits to marginalized smallholder farmers. This assumption is central to the design of the Platform.

Box 1: Big Data Platform's tripartite objectives from the July 2016 proposal

1- Support and improve data generation, access, and management in CGIAR: For CGIAR to embrace the power of big data analytics and be the leader in generating actionable data-driven insights for stakeholders, key requirements, enabling environment components, and critical gaps, which were identified during the scoping consultations. Through collaboration and co-creation with partners identified as the champions in bringing big data to agriculture, the Platform will provide support to CGIAR and partners to address the gaps, both organizational (i.e., Open Access/Open Data [OA/OD] compliance) and technical (e.g., providing useful datasets, tools, and services), and organize capacity building activities to sustain the efforts across the consortium.

2- Collaborate and convene around big data and agricultural development: CGIAR needs ambitious external partnerships to deliver the potential of big data to smallholder agriculture. Likewise, CGIAR is an attractive boundary partner for many private and public big data partners to engage in the context of agriculture in the developing world. This objective will set up system-level partnerships that Centers and CRPs can tap into and use to stimulate greater use of data analytics in CGIAR mission-critical research. Amongst other approaches, the Platform will provide opportunities and spaces for facilitated virtual collaboration and interaction among partners and stakeholders. A Big Data Convention will be organized to bring key actors to CGIAR and CGIAR to the key actors in a network that will be documented and nurtured. The Convention will focus on the generation of ideas and innovations. It will democratize big data opportunities, share progress amongst CRPs and Centers in promoting big data analytics. It will build capacity internally and externally on big data approaches in agriculture. Novel approaches to communications will increase exposure of CGIAR work on big data, and further engage a range of actors through novel approaches to partnerships.

3- Lead by example and inspire how big data can deliver development outcomes: Demonstrate the power of CGIAR big data analytics through "Inspire" projects that solve development challenges at the core of CGIAR SRF. These may include, but not be exclusive to, approaches that use big data analytics and ICTs to provide unprecedented multi-disciplinary data to researchers, deliver novel information to farmers, monitor the state of agriculture and food security in real time and inform critical national, regional and global policies and decisions. Venture capital (<\$100k) will be provided to generate novel approaches, and some larger projects will be developed to deliver on the overall vision of the Platform: democratize big data to include smallholder farmers.

In 2016, the Platform was reported to be grounded on the following **principles**:

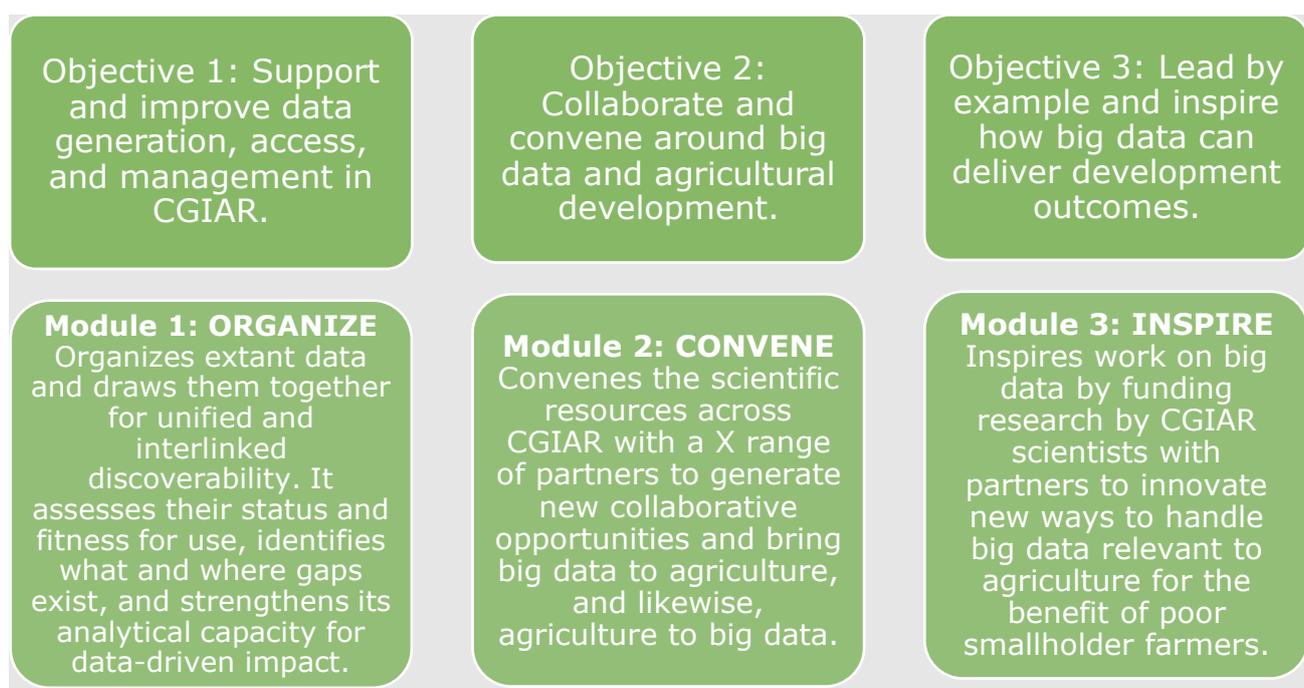
1. *Process-oriented agile approach:* Establish processes and collaborative spaces needed to deliver goals in phases. Supported by agility, and iterative interactions with users to adapt emerging technologies to fulfill growing needs.
2. *Network approach through partnership:* Centered around how networks and communities of practice rather than single institutions leverage technology and new data resources as the basis for solving problems rather than single institutions. These communities of practice can leverage technology and new data resources to create broader and deeper impact in programming.
3. *Iterative data needs assessment and technology landscape analysis:* To better understand Open Data initiatives and Big Data-based Information and Communications Technology for Development (ICT4D) initiatives, a regular data landscape analysis will be conducted for better alignment of the Platform with newly emerging agricultural research and development topics and big data technologies. This also involves the Platform working with its network partners to assess primary user needs through a multi-partner, multi-data stream, multi-country project in each region.
4. The Platform operates a networked partnership model that is co-led by the International Center for Tropical Agriculture (CIAT) with CIAT taking fiduciary and operational responsibility and the

International Food Policy Research Institute (IFPRI). The Platform facilitates the convergence of CRPs, Centers and external partners towards problem solving. It comprises a nucleus secretariat whose primary objective is facilitating dialogue, collaboration, and communication across and between partners. The Platform Secretariat is driven by a knowledge sharing approach in interacting and networking amongst partners.

1.3.3 Platform Structure and Modules

The Platform operationalizes its tripartite objectives via three modules:

Figure 2: Platform Modules and their Objectives⁶



The Platform's Linkages with CGIAR Centers, Platforms and Research Programs

The 2016 proposal laid out the collaboration models between the Platform and other CGIAR Platforms and CRPs. As a matter of fact, the **Organize** Module was conceptualized to actively work with Center and CRP researchers and CoPs (including the data, knowledge, IT, legal, and other relevant system-wide CoPs) in the inventory and management of datasets towards "open" and supporting tools for researchers' use. The goal is to support all Centers and CRPs to not only comply but overachieve open access and open data principles and CGIAR policy on these. The **Convene** Module brings together big data practitioners from Centers and CRPs together with partners and other Platforms in spaces to encourage interaction and pursuit of common goals. The expectation was that the interactions will produce ideas that would encourage applications for funding under the **Inspire** Module to develop them. The Inspire Module creates opportunities for novel ideas to be realized through pilot projects with new partners to CGIAR under collaborative efforts embedded within CRP activities.

Besides, collaboration was envisioned with the Genetic Gains Platform (now [Excellence in Breeding](#), also launched in 2017) through shared infrastructure for processing of genetic data, and the [Genebank Platform](#) (launched in 2017) to the extent to which environmental and socio-economic data can add value to passport information for germplasm collections. The Platform also envisaged to collaborate with CGIAR Gender research network, the [Gender platform](#) established in 2020.

The evaluation team conducted a desk review of the Platform's progress towards the integration of cross cutting themes, namely: Gender, youth, capacity building and climate change. The result of this exercise can be consulted in [Annex 4](#). As well, progress related to the issues of "Intellectual Assets" and "Open Access" are also depicted in [Annex 5](#).

⁶ Source: Adapted from CIAT and IFPRI (2016). Big Data Coordination Platform. Full Proposal (final version). July 2016.

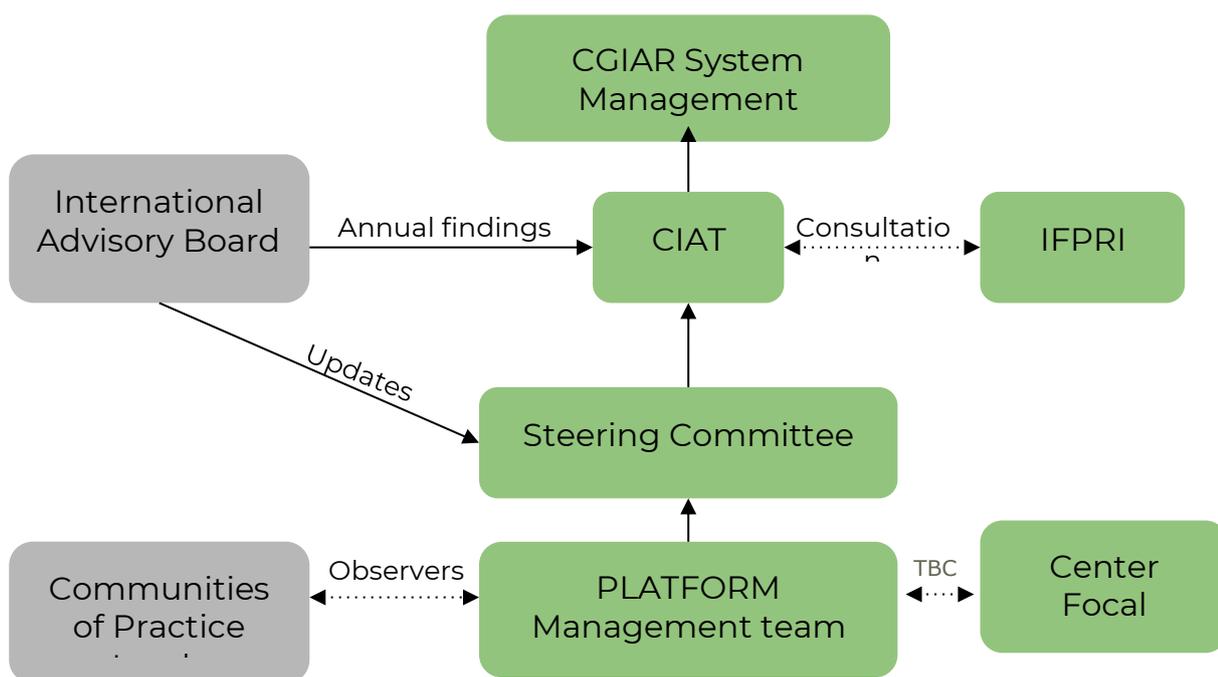
1.3.4 Big Data Platform Management and Governance

The Platform is co-led by CIAT and IFPRI. The CIAT leadership takes fiduciary responsibility, signing the performance contract with the System Office, and consults IFPRI leadership as needed. Implementation is through a secretariat comprising a Big Data Coordinator (Platform coordinator), Platform Co-founders, Module One Leader, a Project coordinator, communication and engagement specialists, and modest administrative support. The Platform coordinator is responsible for intellectual leadership and representation, sign off on deliverables, and has decision-making authority with respect to day-to-day operations of the Platform. Module 1 implementation is led by Dr. Medha Devare who was leading open access and open data work in the Consortium Office. Module 2 and 3 implementation is led by the Platform coordinator. An executive management team includes the two Module leaders and the two Platform co-founders, Dr. Andy Jarvis and Dr. Jawoo Koo. The executive team - meets bimonthly with Communities of Practice' (CoPs) leaders participating as observers.

The project has an eight-(8) member steering committee reporting formally to the CIAT board, whose Chair and Director-General report then to the System Office on the Platform as a whole. The steering committee (SC) monitors the Platform's effectiveness and makes programmatic decisions. Its membership includes one permanent member each from CIAT, IFPRI and the CGIAR System Office. Other members representing their constituents on a two-year rotating basis include one each from CRPs and Centers, and another three representing partners. The committee members assign a chairperson from among these three representatives of partners. The rotating membership is assigned to balance critical knowledge and experience on informatics, legal and intellectual assets, data management, data analytics. The committee was to meet in-person at the annual convention and three to four times virtually. The workings of the SC were to be reviewed after 24 months. A five-member International Advisory Board (IAB) was to be set up, meeting face-to-face once per year, and virtually once per year. Its role was to explicitly examine how the Platform connects effectively with other global and regional efforts for continued relevance and novelty. The IAB membership was to represent related major initiatives such as Open Harvest and Global Open Data for Agriculture and Nutrition (GODAN) with expected two-year membership terms. Findings of the IAB were to be reported to the CIAT Board once per year.

In 2017, the steering committee and the management team including six CoP representatives, and the secretariat were instantiated. The three partner representatives to the steering committee were from IBM (private sector), University of Florida (research), and the Bill and Melinda Gates Foundation (funder). With many management and governance-relevant decisions being made on a regular basis, the steering committee and the management team met monthly in 2018. The IAB was instantiated in 2019 and its members from Food and Agriculture Organization (FAO), GIZ, GODAN, Google, Mars Inc, and Ag Gateway met in person. In 2019, the steering committee was reported to have representation from all envisaged constituencies except for the CGIAR System Office which was not represented. In that year, two external members rotated out and one extended their term. A new CRP representative was introduced in 2019. No changes were made in the Platform governance and management structures in 2020. The Steering committee held 11 meetings in 2020 and the executive management team held 12 meetings.

Figure 3: BIG DATA Platform, Governance and Management Structure⁷



1.3.5 Platform Funding and Budget

According to the 2016 Platform’s Proposal, Big Data Platform had a 6-year budget of US\$30.2m primarily from Windows 1 & 2, representing an annual budget which ranges from US\$3.9m to US\$6.7m. In terms of the budget allocation per module, Module 1 received the largest budget share in 2017 (68% total) and 2018 (58%) with the main cost driver being funding to Centers aimed at improving the effective management of CGIAR data and compliance with the Open Access, Open Data (M) Policy. Module 2’s budget in 2017 was US\$1.46 with a progressive growth by a standard 5% annually to maintain the fixed costs associated with creating an enabling environment. Similarly, Module 3’s budget was projected to double by its fourth year from year 1 (US\$0.6m) to year 4 (US\$1.31m). Budgeted cost for the Platform Secretariat was pegged at US\$300k in the proposal and was covered under Module 2 Convene- with percentage allocations to cross-cutting themes such as Capacity Building (40%), gender and youth-related activities (17%).

Table 1: CGIAR Big Data in Agriculture Platform- Funding and Budget (USD)

Module	2017	2018	2019	2020	2021	2022	Total
Module 1 Organize	4,336,320.51	3,172, 574.31	2,261,673.74	1,159, 962.09	1,125, 489.82	1,192,411.46	13,248,431.93
Module 2 Convene	1,455,300	1,516,077	1,579, 603.14	1,646, 517.85	1,716,339.85	1,789,267.18	9,703,105.02
Module 3 Inspire	612, 720	670, 095.9	1,017, 294.24	1,307, 446.44	1,089,338.37	538,356.48	5,235,251.43
Mgmt. + Support Cost	300,000	315,000	330,750	347,288	364,652	382,885	2,040,575
Total	6,704,340.51	5,673,747.21	5,189, 321.12	4,461,214.38	4,295,820.04	3,902,920.12	30,227,363.38

Source: Big Data in Agriculture re-submitted Proposal

⁷ Source: re-elaboration of the evaluation teams on CIAT and IFPRI (2016) and on CGIAR Annual Reports of the Platform for Big Data in Agriculture.

1.4 Big Data Platform Progress Towards Outputs 2017-2020

The evaluation team conducted a review of the four Platform annual reports and based on the information collected summarized the main outputs achieved (Figure 4).

1.5 Stakeholders' Mapping

Big Data Platform has numerous stakeholders that, to the extent feasible given the time allocated to the evaluation, will be widely consulted and engaged throughout the evaluation process through relevant channels and using the appropriate engagement tools. Based on defined roles and stakes, Platform's stakeholders can be divided into three categories:

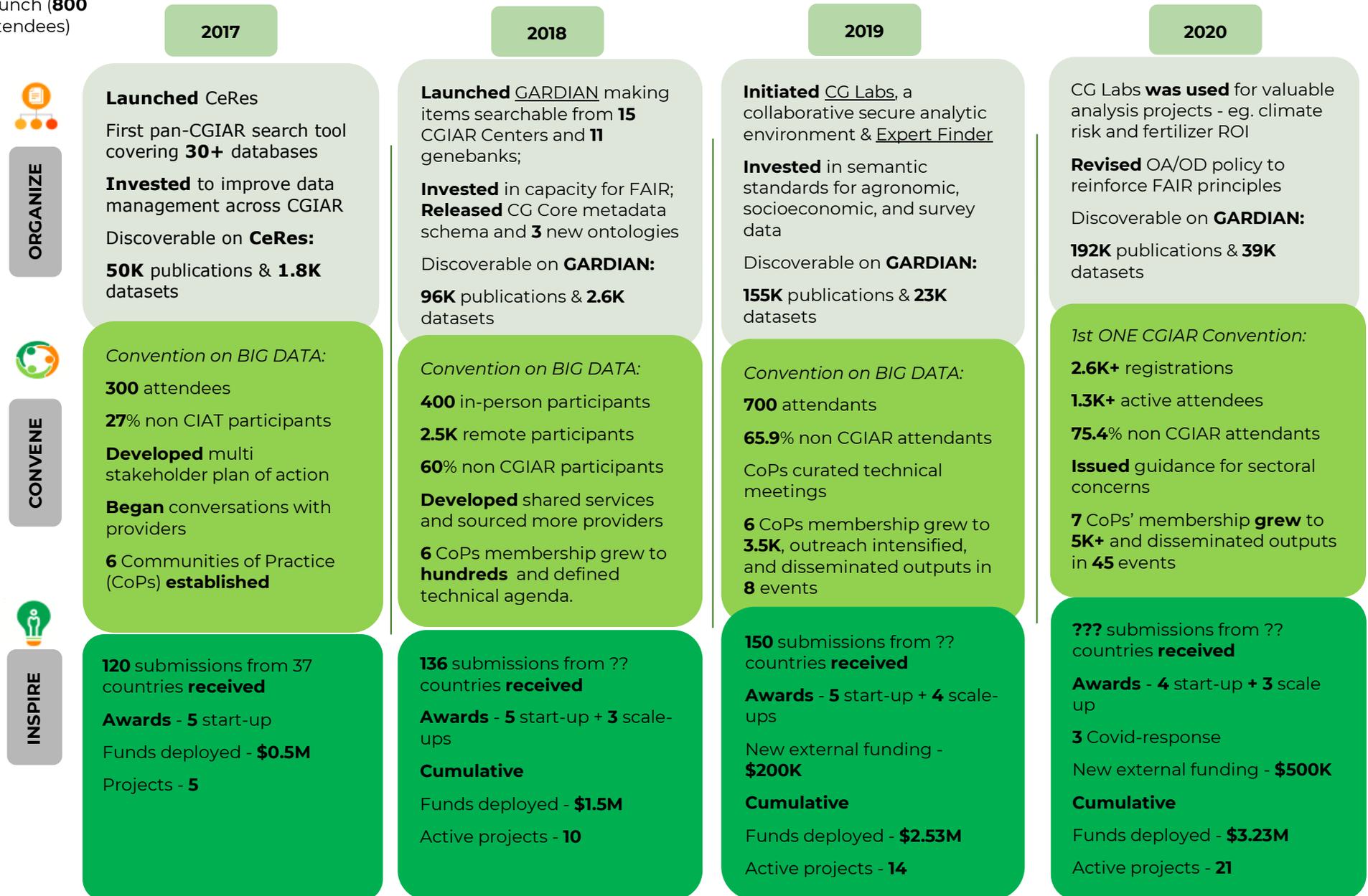
1. **Leadership, Management and Governance Stakeholders:** that includes funders, management and coordination teams. Key stakeholders of this group are the CGIAR System, Council and Funders, the CGIAR System Board, The One CGIAR Platform Performance Management Team, Managing Director, Institutional Strategy and Systems, Global Director, Digital Services, Project Coordination, Monitoring and Performance Management Team, the Platform Secretariat, the steering Committee and the International Advisory Board.
2. **Partners:** This includes a network of diverse partners comprising all CGIAR Centers and 12 CRPs as well as 70 external partners such as international organizations, academia, research institutes, private companies including global players on big data analytics.
3. **End Users:** including all users of the GARDIAN Platform, the 5000 members of the CoPs, the participants to the convention and the participants and winners of the inspiring challenge (Module 3).

It is important to mention that the stakeholder mapping shows that most stakeholders are involved with different levels in all three modules -Organize, Convene and Inspire. The diagram below aims to depict the relationship between stakeholders and their participation in different aspects of the Platform. A detailed list of stakeholders, their role and size is provided in [Annex 3](#).

Figure 4: Platform Timeline

Source: evaluation team re-elaboration from CGIAR Annual Reports of the Platform for Big Data in Agriculture

Launch (800 attendees)

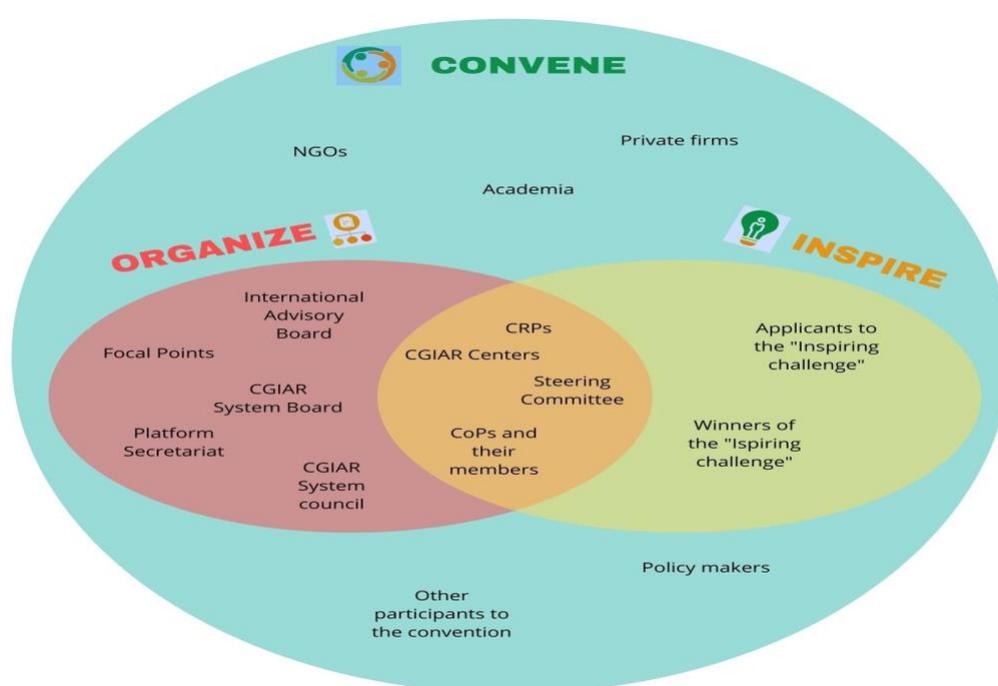


2 Evaluation Objectives and Questions

This evaluation of Big Data in Agriculture Platform will serve the dual purposes of accountability and learning. It will be both summative and formative in nature and will assess the design, scope, implementation status and the capacity to achieve the Platform objectives. It will collate and analyze lessons learned, challenges faced, and best practices obtained during implementation as a guide for future planning. The evaluation will provide essential evaluative evidence for decision-making by the CGIAR System Council, Big Data Platform management, and its partners.

The evaluation **scope** will cover all the activities of the Platform from its initiation in 2017 through mid-2021 considering the need for timely evidence, the transition to One CGIAR, and the COVID-19 pandemic. The evaluation will integrate cross-cutting themes of Gender, Youth, Climate Change and Capacity Development as well as the key issue of Open Data and Intellectual Assets.

Figure 5: Stakeholders' Mapping of the CGIAR Platform for Big Data in Agriculture



The main **objectives** of the evaluation of the Big Data in Agriculture Platform are to:

1. Assess the relevancy of the Platform design, theory of change (ToC) and the Platform's role in positioning CGIAR as a learning organization, its ability cultivate new digital alliances and, pursue data innovation in support of its mission
2. Identify the supporting factors and constraints behind achievements of the Platform and each of its modules and the validity of the ToC assumptions in light of the results achieved, including its response to COVID-19
3. Assess the Platform's governance, management, and implementation processes
4. Provide recommendations relevant to the future development and implementation aligned with One CGIAR Way of Working 7 – Making the Digital Revolution Central to Our Way of Working and One CGIAR initiatives related to digital technologies to include *inter alia* "Harnessing Digital Technologies for Timely Decision-Making across Food, Land, and Water Systems" (Systems Transformation Action Area) and, if applicable, other system-wide recommendations.

The formative and summative purpose will address both the effectiveness of the Platform implementation strategy and the results. This includes the implementation modality, partnership arrangements, institutional strengthening, beneficiary participation and sustainability of the programmatic components in the new organization. The evaluation will include a review of the project design and assumptions made at the beginning of the project development process; Project management including the implementation strategies; project activities and Monitoring and evaluation. It will assess the extent to which the project results have been achieved, partnerships established, capacities built, and cross cutting issues integrated. It will also assess whether the project implementation strategy has been optimum and recommend areas for improvement and learning.

The evaluation will examine project implementation against the hereunder DAC criteria -defined by the OECD DAC Network on Development Evaluation- by addressing the following (broad but not exhaustive) questions.

The DAC criteria will also serve as a framework for the analysis of findings, these criteria provide a *"normative framework used to determine the merit or worth of an intervention (policy, strategy, program, project or activity). They serve as the basis upon which evaluative judgements are made."* Consistent with the CGIAR Evaluation Policy, the evaluation ToR suggest the following DAC evaluation criteria: Relevance, Effectiveness, Efficiency, and Sustainability and lists evaluation questions related to these criteria as shown in the Table 2 below.

Table 2: Big Data in Agriculture Platform: Evaluation criteria and questions

DAC Criteria	Key Evaluation Questions ⁸
Relevance	1. To what extent are the Platform’s objectives relevant to the needs of its internal and external partners, including end-users in target groups?
Efficiency	2. Have resources (funds, human resources, time, expertise etc.) been allocated strategically and timely to achieve Platform outcomes?
Effectiveness	3. To what extent did the Platform achieve progress towards outcomes? 4. How effective has the Platform been in building digital capabilities and partnerships supporting CGIAR research?
Sustainability	5. To what extent are the Platform products and communities positioned to be effective in the future, seen from the perspectives of scientists and of the end users of digital agriculture products and innovations? 6. To what extent would the Platform outputs outlive the existence of the Platform in its current form?

3 Evaluation Methodology

3.1 Overall Approach

The evaluation team will conduct a mixed-methods design (qualitative and quantitative) to collect data and assess program achievements and outcomes. The approach will employ a varied range of methods. Among quantitative methods the evaluation will design and administer online surveys to reach a wide range of stakeholder groups (Data users and Partners), and a-posteriori statistical tests. The qualitative methods will include semi-structured Key Informant Interviews (KII), Focus Groups Discussions (FGDs), document analysis, synthesis of evaluative evidence and descriptive case studies (projects). Both qualitative and quantitative methods will complement each other in ways that together bring credible evidence to answer the evaluation questions.

Given the complexity of the context in which the Platform operates, and the diversity of sectors and stakeholders involved, the evaluation approach and methods will endeavor to embrace a system thinking approach to capture interlinked issues in this innovative program. The qualitative inquiry will tend to be exploratory in nature using open questions and snowball sampling. The approach will remain flexible and new data collection methods can be designed and implemented after better familiarization with the

⁸ Evaluation questions were revised by the evaluation team and CAS Secretariat.

context and the quality of evidence available. Thus, the exploratory nature of the inquiry will assess any systemic and transformational changes among CGIAR, Centers and CRPs as well as among external partners and Communities of Practices (CoPs). The aim is to understand if there are any intended or unintended changes (for example new collaborations, policy change, awareness raise, new internal and external capacities) and to which extent the Platform fostered or contributed to those.

The assessment of data management and stewardship will follow the '[FAIR Guiding Principles](#)'. The guidelines intend to improve the **F**indability, **A**ccessibility, **I**nteroperability, and **R**euse of digital assets. A diverse set of stakeholders—representing academia, industry, funding agencies, and scholarly publishers—have come together to design and jointly endorse a concise and measurable set of principles that are referred to as the Findable, Accessible, Interoperable and Reusable (FAIR) Data Principles.

The evaluation matrix forms the main analytical framework for the Platform evaluation. It sets out how each evaluation question and evaluation criteria will be addressed, and breaks down the main questions into sub-questions, mapping them against them indicators, data collection and analysis methods, and/or lines of inquiry, and sources of information. The Evaluation Matrix ensures that all data collected is analyzed and triangulated and supports the identification of evidence gaps. As such, the evaluation matrix ensures that the evaluation design is robust, credible (reducing subjectivity in the evaluative judgement) and transparent. The evaluation team revised the sub-questions and incorporated new ones based on the desk review. The evaluation matrix can be consulted in [Annex 2](#).

The validation of results and quality assurance will rely on triangulating data and findings from different sources and using different methods. This approach will also help in ensuring transparency, independence of judgement, and minimization of bias. A two-stage analysis will be conducted: Three Component Studies (CS) covering the three main Platform clusters of activities (Modules) will be conducted concurrently and will serve as the main input for the final evaluation report. In addition, internal and external peer reviews will help strengthen the soundness of the articulated findings, lessons learned and recommendations. Presentation of findings will rely on verifiable evidence and robust inference pathways from evidence to conclusions and from conclusions to recommendations.

In line with the 2012 CGIAR evaluation policy, the evaluation approach will ensure the integration of the following **principles**: participatory, learning-oriented, utilization-focused and gender responsive. Participation implies that the continuous involvement of different stakeholders throughout the evaluation process leads to conclusions and recommendations that are more widely acceptable, and thus more likely to be acted on, and more likely to lead to the envisaged outcomes. To the extent that their time allows, the Platform coordination team is invited to participate actively in the evaluation through the review of the inception report, data collection instruments, and in the interpretation of the results. Stakeholder groups that will be consulted will be inclusive of all stakeholders' categories and subcategories (see Stakeholders' mapping) and a special attention will be given to gender balance and youth inclusion. Likewise, data collection will be conducted in a way that ensures full understanding, respect and complete confidentiality of stakeholders' views and perceptions.

Finally, this Platform evaluation is designed as an entirely desk-based exercise; it will follow a pre-determined process, guided by the validated terms of reference ([Annex 8](#)). The evaluation study will endeavor to build on existing findings and information elaborated under the framework of internal monitoring and evaluation (M&E) efforts across the Platform implementation.

CAS Secretariat's processes will guide, and quality-assure the evaluation process.

3.2 Data Collection Methods

3.2.1 Three Component Studies

Each Component Study (CS) will cover a cluster of activities corresponding to the three Platform modules: Organize (CS1), Convene (CS2), Inspire (CS3). The studies will adopt the same analytical framework centered around the evaluation criteria and questions. Each CS will be led and drafted by one Subject Matter Expert (SME) who will get the logistic, coordination and analytical support from the Team Leader (TL) and two consultants. Some data collection methods that will be designed and used exclusively for a CS (i.e. Platform users' survey) while others will be commonly used by the three studies

(interviews of Platform Management team, interviews with Center focal points). The methodology and tools for each data collection method will be further developed under each component study.

Under the framework of each component study, the Evaluation team will conduct a review of relevant cases (projects and/or individuals) from 2017 to mid-2021. The analysis framework will be developed along the key elements of the evaluation matrix. projects and/or individuals will be purposefully selected to showcase the diversity of projects and their related outputs, outcomes, failures, and successes. As well as harvesting un-intended outcomes and challenges. We envisage to conduct KII and FGDs as main method to collect testimonies.

Table 3: Key Features of the Three Component Studies

	CS1- Organize	CS2- Convene	CS3- Inspire
Subject Mater Expert	Dr. Didier G. Leibovici	Dr. Mathew Kurian	Dr. Erik Bongcam Rudloff
Focus	Data generation, access, and management.	Collaboration and conventions around big data and agricultural development.	Inspire challenge competition and how big data can deliver development outcomes.
Main Target Group (end users)	Data users	Members of Communities of practice (CoPs), participants to the Conventions and Capacity development beneficiaries	Competition candidates
Cross cutting themes	Gender, Youth, Climate Change (CC), Capacity Development (CapDev)		
Evaluation approach	Primarily quantitative	Qualitative and quantitative	Primarily qualitative
Data collection methods*	Platform Statistical Analytics User survey	KIIs/FGDs Partner survey	Descriptive Case Studies Complementing the 2021 Inspire Challenge Review
Sampling technique	Representative	Purposeful	Purposeful

* Here are specified the main method for each CS but all CSs will use and triangulate with other data collection methods results.

3.2.2 Desk Review

The desk review focuses on the review of existing internal and external documentation. This exercise is carried out at the inception phase and it aims to obtain an initial understanding of the Platform structure, governance and management, implementation, and an initial appraisal of outputs achievements. The desk review covered several types of internal and external documents: strategies, evaluation reports, annual reports, etc. The list of references can be found in [Annex 1](#).

From the desk review, the evaluation team assembled the list of stakeholders and their categories (see section stakeholders' mapping). This will help the team to ensure the participation of all categories of stakeholders.

Desk review and research will continue throughout the evaluation process and with a view to identifying preliminary answers to the evaluation questions. It will include documents analysis and synthesis of evaluative evidence.

Documents Analysis

Like other analytical methods in qualitative research, document analysis requires that data be examined and interpreted in order to elicit meaning, gain understanding, and develop empirical knowledge (Corbin & Strauss, 2008; see also Rapley, 2007 cited in Bowen, 2009). The evaluation team will select and conduct a keyword search to assess the extent to which issues around OA/OD principles have evolved within CGIAR CRPs and centers (i.e. semantic standards, and ontologies, analytic environments, etc). This can involve the identification of changes of scientific culture embracing the Platform and principles therein, evaluated from the evidence of the recent scientific practices and outputs This can be quantitative and qualitative and is focusing on reflecting on the level of adoption of the principles and the tools available (via the Platform).

Synthesis of Qualitative Evaluative Evidence

The evaluation team identified five documents (three assessments and two reviews) dated after 2017 (after the launch of the Platform) to include in the synthesis. Findings of this exercise will be contrasted with the [2021 Synthesis of Learning from a Decade of CGIAR Research Programs](#).

Table 4: Mapping of Evaluative Evidence related to the Platform

#	Topic/Evaluand	Title	Year Published	Type
1	INTELLECTUAL ASSETS PRINCIPLES	Review of CGIAR Intellectual Assets Principles-2017	2017	Review
2	OPEN ACCESS/ OPEN DATA	Review of CGIAR's Open Access/Open Data Policy and Implementation Support-2018	2018	Review
3	BIGDATA	CGIAR Platform PMS Pilot Assessment Report, Big Data	2019	Assessment
4	DIGITAL STRATEGY	Toward a digital one CGIAR: Strategic research on digital transformation in food, land, and water systems in a climate crisis	2019	Assessment
5	Inspire Challenge Module	CGIAR Platform for Big Data in Agriculture - Inspire Challenge Review (2017-2020)	2021	Review

The synthesis of evidence relies on an examination of selected documents which are analyzed following a systematic procedure for reviewing both printed and electronic documents (computer-based and internet-transmitted) material (Bowen, 2009). The analytic procedure entails finding, selecting, appraising (making sense of), and synthesizing data contained in documents.

For this synthesis, the evaluation will use the software package [MAXQDA](#). The software allows to store and manage the selected evaluation documents. It allows to look at specific coded data separately, with memos and comments for formulating, summarizing, and reflecting interpretations.

3.2.3 Qualitative: Key Informant Interviews and Focus Group Discussions

We envisage that all the Key Informant interviews (KIIs) and Focus Group Discussions (FGDs) will be via videoconference⁹. The identification of interviewees will be as inclusive as possible of the categories and subcategories identified in the stakeholder mapping and then the evaluation team will use a snowball approach as appropriate. We approach interviews as discussions loosely structured around a small number of key issues. The aim is to encourage stakeholders to talk freely about what they consider important. KIIs and FGDs will help triangulate the quantitative and qualitative data collected through desk research and surveys.

The evaluation team is developing KIIs and FGDs protocols tailored to each stakeholder category and where possible, interviewees will be given the possibility to talk with their preferred language so they can explain their opinions and ideas in depth.

3.2.4 Quantitative: Platform Statistical Analytics

Under the Organize Component Study (CS1) the evaluation team will conduct analytics on user behavior in the website traffic – i.e. GARDIAN, CG Labs, the Expert Finder for notable historical trends, etc. Publications and Datasets uses by types, gender (if possible), volumes, FAIR ratings, Center/CRP, demand (downloads), country, thematic area etc. This data collection method will be complemented by a user survey and further developed after better familiarization with the available data and its quality and format.

⁹ Access to be facilitated by CAS

3.2.5 Quantitative: Two Online surveys

The evaluation team envisages to conduct two online surveys targeting users of the Platform and partners including the members of communities of practices. The team will build on previous data collection efforts conducted by the Platform to ensure continuity and coherence and for some cases this can allow comparison and an assessment of changes. For example, consultations conducted under the framework of the "[Digital one CGIAR: Strategic research on digital transformation in food, land, and water systems in a climate crisis](#)" will be used in the design of the online survey targeting partners and centers. The evaluation team will use SurveyMonkey software for survey administration and analysis.

3.3 Phases of the Evaluation

3.3.1 Inception Phase

The inception phase is dedicated to fine-tuning the evaluation plan and methodology and gaining a first understanding of the Platform program. An induction meeting took place via videoconference on July 20 between the evaluation team and the CAS Secretariat.

As presented above, the inception phase focus was/is on the following elements:

- Preliminary project theory model(s); refinement of the evaluation questions, elaboration of evaluation methodology including quantitative and qualitative approaches through an evaluation framework ("evaluation matrix")
- A stakeholder analysis identifying key stakeholders, networks and channels of communication
- Program timeline and key outputs achievements based on Platform annual reports and 2016 proposal
- Division of roles and responsibilities between the evaluation team members
- People to be interviewed and surveys to be conducted and a debriefing and reporting timetable.

As a requirement to finalize the inception report, a consultation was arranged between CAS Secretariat, the evaluation team and peer-reviewers to interrogate the evaluation approach and methodology and enhance the evaluation matrix.

3.3.2 Data Collection Phase

The data collection phase is meant primarily to collect data from desk research and stakeholder consultations (KIIs, FGDs, Online surveys etc). The evaluation team will collect the evidence according to the plan, complete its analysis, and prepare a preliminary list of findings and conclusions.

3.3.3 Reporting Phase

In the reporting phase, the evaluation team will prepare a presentation of preliminary findings, to debrief CAS Secretariat and the Platform Management and to seek validation, factual corrections, and feedback. The team will develop three component studies and the draft evaluation report for CAS Secretariat comments and factual corrections. Under CAS Secretariat's guidance, the report will be reviewed by a team of external peer-reviewers. With the feedback from relevant stakeholders, the evaluation team will finalize the evaluation report considering comments according to the team's judgement.

The Indicative Evaluation Report Outline will include:

Executive Summary

Introduction

Methodology

 Limitations

Key Findings

 Relevance

- Efficiency
- Effectiveness
- Sustainability

Conclusions

Recommendations

Annexes

- References

- Component Studies- Executive Summaries

- List of Stakeholders Consulted

- Evaluation Matrix

- ToRs

3.3.4 Management Response

During this phase, CAS Secretariat will liaise with the Platform Project Coordination, Monitoring and Performance Unit through its relevant Tasks Units- Project Coordination Unit (PCU) and, Monitoring and Performance Management Unit (MPMU)¹⁰ to request the management response with the Platform management. The management response will be published on the CAS Secretariat website.

3.3.5 Dissemination

The evaluation report, its executive summary, report from component studies and the evaluation brief and other knowledge products along with the management response, will be published on the CAS Secretariat's website. In line with the dissemination and knowledge management strategy to be developed at the inception phase, tailored presentations will be made to targeted stakeholders and learning events organized with internal and external stakeholders.

3.4 Limitations and Mitigation Actions

The evaluation has limited time and both the nature of the evaluand – a big data Platform whose stakeholders and end users are spread all over the world– and the current travel restrictions caused by the COVID-19 Pandemic make travel somewhat unlikely. As a result, we have built our design around methods that will be carried out at a distance.

The evaluation team is aware of the shortcomings of conducting online consultations and the effects this model can have on the quality of interactions between evaluators and stakeholders. To mitigate this, evaluators will have their cameras turned on during the meetings and interviewees will be asked to turn on their cameras if they feel comfortable with it and where possible they will be given the chance to talk in the language of their preference, building on the evaluation team's diverse language skills. Besides, interviews are designed to be semi-structured, and stakeholders will be strongly encouraged to share their ideas freely about what they consider important.

The Platform key stakeholders have recently been consulted by the Platform around themes and questions similar to those of this evaluation. For example, in 2020-21, the Platform conducted a [review of the Inspire Challenge](#) and a [Strategic research on digital transformation](#). This can give the impression of redundancy and repetition among stakeholders and they may be unwilling to engage especially those with a busy schedule. Therefore, the evaluation is designed in a way that builds on previous Platform assessments' efforts -using previous surveys as a baseline where possible, analyzing the quality of evidence presented in previous reports through the synthesis of evaluation evidence and conducting consultations in a way that brings more depth and explanations around the already identified inferences, etc.

¹⁰ If these entities do not yet exist, the interaction will be with the existing System Office Programs Unit.

As the evaluation team will be reaching out to Platform end-users and to a wide range of partners through online surveys, the experience of similar exercises and the last Platform online consultations show that surveys may record a low response rate to address this risk, the team will approach people and introduce the survey in a warm manner, design short and structured surveys giving the option to answer or not the open questions. The team will translate the surveys to two languages. Finally, the response rate will be closely monitored and reminders will be sent. In addition, the team foresees to conduct the surveys in a non-holiday period to increase the response rate (September). To control for non-response bias, care will be taken to ensure that a representative sampling of the targeted stakeholder groups is conducted.

4 Evaluation Workplan, Milestones and Management

The Platform evaluation follows a pre-determined and standardized process that is guided by the ToRs and elaborated further based on feedback from CAS and peer-reviewers. The table below indicates the principal phases and associated deliverables:

Table 5: Evaluation Workplan

Evaluation Phase	Tasks	Outputs	Responsible	Dates/2021
Preparatory	Draft evaluation ToR /ToR Revisions	Final evaluation ToR	CAS Secretariat	9 July
	Selection of consultants from the vetted roster	Evaluation team contracts.		
Inception	Onboarding and briefing of the external evaluation team	PPT	CAS & Evaluation team lead	21 July
	Development of the Inception report with the evaluation matrix	Draft inception report with evaluation matrix	Evaluation team	26 July
	Introduction consultation with the Platform management, and validation of the Inception Report	PPT Final inception report and evaluation matrix	Platform Management Evaluation Team	28 July 30 July
	Peer review of the methodology and approach.			
Inquiry	Desk review		Evaluation Team	1- 8 October
	Survey	Survey result notes		
	Interviews	Interview notes		
	Data triangulation for developing Module component studies	3 Module component study reports		
Reporting	Analysis and report development	Detailed report outline for feedback to CAS	Evaluation Team and CAS Secretariat	11-15 October
	Validation workshop with the Platform Management	PPT		

Evaluation Phase	Tasks	Outputs	Responsible	Dates/2021
	Submission of draft Platform evaluation report	Draft Platform evaluation report	Evaluation Team CAS with peer reviewers	25 October
	Report review by CAS, peer-reviewers and key stakeholders as needed.	Compiled feedback by peer-reviewers and key stakeholder groups.		1 November
	Integrating CAS and Peer-reviewer feedback into the discussion version of the report.	Draft final report		5 November – December 4
	Presentation of Draft final Report to SIMEC for feedback	Draft discussion version of the final report, PPT	CAS Secretariat with selected SMEs	
	Revision of the final report integrating SIMEC's feedback	Revised draft discussion version of the final Report	Evaluation Team	
	Presentation of final Report to System Council	Draft final report. PPT	CAS Secretariat/Evaluation Team	
		Final report	Evaluation Team	
Management Response	Liaising with Project Coordination, Monitoring and Performance Unit for obtaining Management Response coordinated by Project Coordination, Monitoring and Performance Unit.	Management response	Platform Management , liaising with CAS Secretariat, Platform Project Coordination, Monitoring and Performance Unit.	December 2021
Dissemination	Development of knowledge products and knowledge management in line with the Dissemination strategy for the Evaluation.	Evaluation briefs and knowledge products.	CAS Secretariat/Evaluation team where necessary.	December Onwards

4.1 Evaluation Associated Deliverables

The following deliverables are presented against the above milestones and are key to the process of implementation of the evaluation.

Table 6: Evaluation Deliverables

Key Deliverable	Description	Date/2021
Inception report	Establishes a common basis of understanding for the overall approach, outlining the scope, the evaluation matrix, the methodological tools, agreed workplan for CAS to ensure that the process is streamlined going forward and according to the TOR and expectations. The inception report is based on the template for the 2020 reviews, guided by IEA guidance note on inception report.	26 July (Draft)
		30 July (Final)
Module component study reports	One report per SME, 10 pages plus a 3- page briefing report in a template.	1 Oct (Draft)
		8 Oct (Final)
Evaluation report	25 pages, excluding Annex, bringing together the outputs from all SMEs, analyzed to answer the evaluation questions. Heavy Annexing of supporting evidence used. Describe findings, conclusions, and recommendations, based on the evidence collected. The recommendations will be evidence-based, relevant, focused, clearly formulated and actionable. They will be prioritized and addressed to the different stakeholders responsible for their implementation. The main findings and recommendations will be summarized in an executive summary.	25 Oct – Draft, validation with Big Data team and CAS, and peer-reviewers
		5 Nov – 2 ND Draft with all feedback integrated.
		5 Nov – 4 Dec- Draft Discussion Version of the final report with SIMEC feedback integrated
		10 Dec- Final report with SC feedback integrated

PPTs presentations made at various stages in the evaluation implementation. Other derivative products (blogs, video, briefing notes etc.) will be produced in line with the knowledge management plan during and after the endorsement by the System Council.

4.2 Process Quality Assurance and Deliverables

Across the evaluation lifecycle, a multi-layered quality assurance system which addresses all dimensions of quality, including evaluation design, process, team, timelines, and the final deliverables will be followed in order to meet the objectives of CGIAR Platform for Big Data.

Quality Assurance by CAS: CAS is responsible for the quality assurance of the evaluation process and outputs, and for the dissemination of the results. CAS secretariat will work closely with the evaluation team throughout the evaluation, and will ensure that the tools and methodologies, as well as the process followed, are in line with CGIAR Evaluation Policy and Standards. Regular communication between the evaluation team and CAS, and check-ins at the key points, are standard.

External peer reviews: CAS quality assurance of evaluations includes external peer review for each evaluation at two stages in the evaluation process. First, evaluation peer reviewers will check the choice of methodology to assure the quality and technical soundness and, second the draft evaluation report; the SME peer-reviewers will review the programmatic and technical findings, and, if it is appropriate for answering the evaluation questions, that the design is valid for the methodology, the sampling and data analysis are appropriate, and finally the results and conclusions are valid for the sample and context. At each stage the drafts are circulated for review and comments from the external peer reviewers and the comments made are collated and addressed in a matrix, which is provided to the evaluation team.

The Team Leader: the team leader is responsible for the overall product, including the first level of QA of the work by team members; checking the quality and promptness of all outputs and ensuring that the

evaluation complies with CGIAR Evaluation standards and with broader international evaluation standards. The team leader will assure the quality of the SMEs processes and products, this oversight function will be a critical role for the Team Leader in ensuring consistency and quality of the overall evaluation.

Quality Assurance checklists: The QA checklists will be useful tools for self-assessments, and to facilitate intra team coordination and communication. When used by the TL and SMEs it will help ensure the team is focused on delivering towards the Platform evaluation's desired objectives. These will include:

- Interactions between TL and SME – communication, understanding of the methodology, clarity on roles and responsibilities, mutual reliance, coordination, and collaboration etc.
- Team interactions with CAS, partners - constructive engagement, coordinated approach of the team, sharing data etc. as required, constructive stakeholder interviews etc.
- Progress in data collection and analysis – to ensure scope of work and report template are well understood and followed, evidence basis is understood, and qualitative and quantitative analyses integrated appropriately.
- Ensuring preliminary findings and conclusions are clearly and logically presented, objectively determined, and supported by documented evidence.
- Final findings are derived directly from the Platform evidence, backed by use of evidence from cross-cutting themes and logically described in ways that answer the evaluation questions and sub-questions.
- Recommendations must be directly derived from specific conclusions and be realistic and actionable, within the parameters of the One CGIAR Research and Innovation Strategy.

Checks on delivery of Module component reports from the SMEs: The self-assessment, check-in by TL and CAS (final dates to be confirmed by CAS) of the evaluation provides a structured point for TL and SMEs to discuss the progress and any challenges of the evaluation with the CAS team to facilitate the successful execution of the evaluation. It will supplement regular discussions between the TL and the CAS Secretariat. QA checklist for the module component reports from the SMEs will be the basis for the discussion.

Final report check: In the week of 5 November, the evaluation team will submit its 2nd draft report (integrating feedback from peer-reviewers), to CAS Secretariat first and then discuss for any further clarifications needed with Platform stakeholders. QA checklist for the draft report provides further QA guidance to the review team. Challenges and opportunities identified in these discussions will be resolved into the report. QA checklists for the evaluation reports set out the requirements for inter alia:

- Clarity and logical flow in the reports.
- A concise executive summary, setting out the scope and purpose of the evaluation and the key questions addressed, briefly describing the methods used and summarizing the main findings, conclusions, and key recommendations.
- A clear and concise introduction and background, and description of the scope of the review methodology, organization of the review team and summary of limitations.
- The methodology will need to outline the approach used and rationale, the data analysis methods used and the limitations and mitigation of the Platform evaluation.
- The findings sections will need to be clearly and logically described, evidence- based and limited to what has been observed, collected, mined, or calculated from the reference materials and data sources, answering the evaluation questions. Charts and tables must be easy to read and interpret and the discussion of evaluation findings objective and balanced, covering both positive and negative findings and clearly addressing all the evaluation questions and sub-questions, with explanations for those that cannot be answered.
- Conclusions must be clearly derived from stated findings, be formulated to answer the Evaluation Questions and sub questions, and the recommendations must derive directly from these

- All recommendations must be realistic, actionable, and clearly indicate who is responsible for taking recommended actions and at what level.
- In style, the reports should be written clearly and in an active voice to engage non-experts and so that they can readily understand and find their way through the report.

Final check: As a final step process in finalizing the evaluation report and to obtain the expected output, a final check will allow the CAS Team to better understand and review the weaknesses and strengths. Gathered lessons learned will be complemented with final report checklist results and a “review of reviewing.” Here, the Executive summary will be cross-checked and the report checked to ensure it follows the agreed template, with the final report being well-written and systematically addressing all (Platform/CAS/Peer-reviewers) comments and suggested changes from the draft version, with these changes documented and retained in the share-point.

Templates: The Team Leader and SMEs would follow the CAS report and PPT templates in the CAS style guide¹¹. Feedback loops to the SMEs from TL and CAS on their outputs would ensure these are revised where necessary to align with the report template, CAS QA guidelines and style guide for reports and communications.

After submission of the discussion version/pre-final report by the evaluation team to CAS, the final report will be copy edited and reviewed to ensure quality standards are met.

4.3 Evaluation Management and Roles

4.3.1 Role of the CAS Evaluation

CGIAR Advisory Services Secretariat (CAS) will guide the evaluation team in the design and implementation of the evaluation.

To ensure the independence of the evaluation, the CAS Secretariat’s staff will not participate in meetings where their presence could bias the responses of external stakeholders. Adequate consultations with evaluation stakeholders will be ensured by the evaluation team and the CAS Secretariat throughout the process, with debriefings on key findings held at various stages of the evaluation. The Evaluation Function Lead will ensure transparent and open communication with stakeholders during each of the key evaluation phases.

4.3.2 Big Data Platform Management

The Platform’s management, steering committee and focal persons will respond to the Evaluation team’s needs for information throughout the evaluation: documentation and data, access to partners and staff for engagement with the evaluators, and information on partners and stakeholders. These actors will also be responsible for giving factual feedback on the draft evaluation report.

4.3.3 Team Leader Role

CAS secretariat has framed and agreed the review with the CGIAR System Council through its relevant committee, and these are the bounds within which the Team Leader (TL) will direct and coordinate the process. The Team Leader, who is the lead author for the report, will be coordinating this effort and be accountable for the evaluation team’s performance and provide clarifications after submission of the final report. The TL roles will include:

1. Serve as a main point of contact for CAS Secretariat for the Platform Evaluation team
2. Lead engagement with Subject Matter Experts (SMEs) and members of the evaluation team, aided by the CAS’ Evaluation Function
 - a. Lead the evaluation team during the relevant evaluation phases
 - b. Oversee the preparation of, and quality-assure data collection outputs by SMEs and other members of the team

¹¹ All available templates to be provided in the designated folder in the SharePoint.

- c. Consolidate team members' inputs to the evaluation products (inception report and the evaluation report)
- 3. Lead the delivery of the inception report, draft, and final evaluation reports
- 4. Inform CAS of any potential delays and management-related issues
- 5. Contribute to the knowledge management of documentation across the Platform Evaluation team, in line with contractual obligations of CAS ownership of such documentation
- 6. Monitor any arising declarations of conflicts of interest among the Subject Matter Experts and raise these to the attention of CAS Evaluation Lead and CAS Secretariat Director
- 7. Where necessary, represent the evaluation team in meetings with stakeholders.

Specific tasks of the TL through the phases of the evaluation include:

1. PREPARATION

- a. Briefing by the CAS Evaluation function, familiarization with background reading of specified in the ToR and other documents as required, helping to facilitate onboarding and recruitment of subject matter experts and peer-reviewers by CAS.

2. INCEPTION

- a. Lead the refinement of the evaluation questions, elaboration of the Platform evaluation methodology with quantitative and qualitative approaches, including case studies, through an evaluation framework. The analytical framework would identify the means of addressing the questions, including an outline of the data collection methods and instruments, this would feed into the development of the inception report.
- b. Lead the conduct of the stakeholder analysis with the identification of groups of interlocutors and the Platform's internal and external partners, and preliminary list of interviewees and possible surveys to be conducted with the division of roles and responsibilities between the team leader and the SMEs.
- c. Oversee preparation for and conduct of a consultation on the Platform evaluation methodology and approaches with CAS and external peer reviewers.
- d. Lead the development of Inception report with peer-reviewed evaluation approach and framework, workplan, limitations and other key domains in line with IEA [Guidance on evaluation inception reports](#).
- e. Lead the preparation of the Platform evaluation report outline in line with the [IEA Guidance Note 5](#), in close collaboration with CAS Evaluation.

3. INQUIRY

- a. Coordinate and provide guidance to the evaluation team's analysis and work
- b. Provide substantive leadership to the overall analysis, findings, conclusions, and recommendations of the Platform Evaluation and Module Component studies
- c. Coordinate review and meta-analyses and compilation of preliminary evidence along the evaluation matrix
- d. Coordinate compilation of reflections on the preliminary evidence
- e. With SMEs, coordinate and participate in interviews with internal and external Platform stakeholders, as needed, using interview guide(s).

4. REPORTING

- a. Lead the preparation of the detailed report outline, coordination of the inputs provided by the team members, preparation of the draft Platform Evaluation report
- b. Lead the preparation of the comprehensive discussion version of Platform Report for System Governance; coordinate the validation consultation workshop with CAS Evaluation
- c. Manage the integration of relevant feedback into the discussion version of Platform Evaluation Report for System Governance
- d. Coordinate the development of materials for selected presentations and learning events around the launch of the Final Platform Evaluation Report (PPT, brief, others).

4.3.4 SMEs' Role and Management

SMEs will report through the Team Leader to CAS Secretariat. The TORs for the Subject Matter Experts direct them to focus on the CGIAR areas of work for which they have specific expertise. Each SME was assigned to lead the development of a designated module component study report. To achieve this, the SMEs will address the questions set out in the Analytical Framework described above, as they relate to the designated modules within their purview and integrating cross-cutting themes.

The module component study reports will be annexed to the Platform Evaluation Report, with extracts presented in the evaluation report as applicable in answering the evaluation questions. The Team Leader will ensure a consistency of approach between the experts and alignment with the evaluation TORs. The Team Leader will be responsible for their ultimate collation as a unified evaluation report.

a) Role of in Information, Communications Technology (ICT) and data management

The medium level expert is expected to conduct the bulk of the desk data collection & analysis, including: conducting a portfolio review of all projects financed under the Big Data Platform, analyze quantitative data, incorporating artificial intelligence or machine learning techniques where necessary and report back to the team leader and more generally support the evaluation TL with data analytics and data visualization aligned with up-to-date data science methods to strengthen and expand insights aligned with the evaluation framework.

b) Internal Communication

Within the geographically-dispersed evaluation team, effective communication, collaboration and knowledge sharing is paramount. Thus, the following communication and knowledge management procedures are maintained:

- Regular meetings (remote)- regular internal communication to help ensure that the findings are discussed from both SME and evaluation perspectives and ground-truthing to enable the analyses required
- Through access to the SharePoint system which allows for easy storage, sharing and co-creation of data and documents across the team.
- The evaluation team will engage regularly with CAS team to provide updates and seek guidance and decisions at critical points
- All team members have been made aware of the tight schedule involved and the need to keep to the calendar and to conform with the CAS guidelines for preparation of reviews and the associated Style Guide.

In the process of data collection, the Team Leader and SMEs will communicate with selected key stakeholders, under the guidance of the CAS team.

The CGIAR evaluation principles guide all aspects of the Platform evaluation, communication will be open and two-way allowing for feedback loops. Communication and interaction will be shaped by transparency and ethics in a multi-cultural environment to promote constructive collaboration and learning.

4.4 Risks Management and Mitigation Actions

The TL will manage the work and delivery of the quality-assured outputs from the evaluation team through regular communication and feedback loops and aided by CAS Evaluation Function with a focus on content and contractual issues. The TL will ensure the necessary clarity and support on specific aspects of the assignment. The requirements of the SMEs are very specific, and the TL will take steps to ensure that they remain in line with their TORs and expectations of the CAS.

Table 7: Risks management and mitigation actions

Risk	Likelihood	Impact	Mitigation Measure
Significant data gaps or that these are not provided in a timely manner	Low	High	Access to extant project documentation is available on SharePoint. The Evaluation Team will establish direct contact with the Big Data Platform Team as is deemed needed. Project information will be supplemented through data collection to ensure key information is collected in a consistent format.
Falling behind schedule	Medium	Medium	Performance to the timeline and work plan will be monitored weekly by the TL and reported to CAS Secretariat to agree on any required remedial steps agreed jointly to minimize the likelihood of slippage to the process of delivery.
Conflict of Interest	Low	High	All staff and consultants interacting in the project have signed statements related to potential conflicts of interest on file with CAS Secretariat. In case of new arising interests to declare, these will be communicated and assessed promptly via the TL to the CAS Secretariat. For interests already declared, risks will be managed through transparent sharing of information across the team and documented in the final report, and when necessary specific SMEs will recuse themselves from discussions in which they may have an interest.
Divergence in opinions and difficulty in reaching consensus on key findings	Low	Low	Rigor in the validation process will be adhered to, through triangulation of evidence to support a systematic and methodological approach while considering potentially conflicting views to produce consensus. The review of evaluation reports by external peer reviewers and relevant internal stakeholders will be provided.

4.5 Knowledge Management and Dissemination

The evaluation report of the CGIAR Platform for Big Data in Agriculture will be disseminated to key internal and external stakeholders. The evaluation report and its derivative products will be publicly available and in appropriate formats. User-friendly, and visual communications products, tailored to specific audiences will be developed to create awareness, promote adequate utility, accessibility, dialogue, follow-up and reach to support organizational learning and use for decision making. The potential for additional derivative products picking up on specific issues will be assessed based on the strength of evidence in the technical report.

4.5.1 Knowledge Management

The 2021 Platform evaluation knowledge management (KM) strategy covers knowledge management of evidence. The KM strategy comprises two parts (a) the first part embodies an internal communication and dissemination plan targeted to CAS Secretariat's internal stakeholder groups and (b) the second part covers an external plan, targeting engagements with key external stakeholders.

The team will ensure the documentation of processes for knowledge management is established and maintained and recognizing the relative quality and independence of different source materials used. These will include all analysis documentation and Notes from the interviews – where appropriate. Confidential access has been provided to the extant documentation relating to the Platform. Confidentiality is expected as spelled out in contracting documents. Access to internal files will terminate when contracts concluded, whenever these may be granted.

4.5.2 External Communication and Dissemination

The following are the key evaluation products: the TOR, the inception report, three (3) module component reports and the 2021 Platform evaluation report.

Other products throughout the implementation of the Platform evaluation and afterwards:

- Evaluation brief: Succinct and interesting '3-pager' document, including crystallized findings and recommendations
- Module Component Report Briefs- 3 Modules: '3-pager' highlighting curated findings for each of the Big Data Platform modules, Organize, and Inspire respectively
- Power-point presentations- tailored to specific target audiences
- Infographics
- Audio-visual material – (3 minutes) highlighting key findings and recommendations
- Supplementary dissemination products would be produced, depending on the needs of the target audiences.

The evaluation knowledge products will be disseminated via CAS website, e-newsletter, social media, emails to targeted stakeholders, and tailored presentations to target audiences to ensure effective and efficient communication to promote the uptake of findings.

Annexes

Annex 1: References

Articles, Reports and Documents

Bowen, G. A. (2009). Document analysis as a qualitative research method. *Qualitative research journal*. <https://doi.org/10.3316/QRJ0902027>

CIAT and IFPRI (2016). CGIAR Big data coordination Platform. Proposal to the CGIAR Fund Council, 31 March 2016. International Center for Tropical Agriculture (CIAT), Cali, Colombia and International Food Policy Research Institute, Washington DC, United States of America.

CGIAR (2017). *Annual Report of the Platform for Big Data in Agriculture*. CGIAR Advisory Services (CAS) Secretariat - Annual Report 2017.pdf - All Documents (sharepoint.com)

CGIAR (2017a). *CGIAR Platform for Big Data in Agriculture International Advisory Board ToR*. July 3, 2017. CGIAR Advisory Services (CAS) Secretariat - International Advisory Board TOR.pdf - All Documents (sharepoint.com)

CGIAR (2017b). *CGIAR Platform for Big Data in Agriculture Steering Committee*. August 3, 2017. CGIAR Advisory Services (CAS) Secretariat - Steering Committee TOR.pdf - All Documents (sharepoint.com)

CGIAR (2017c). *CGIAR Platform for Big Data in Agriculture Management team*. November 8, 2017. CGIAR Advisory Services (CAS) Secretariat - Management Team Fact Sheet.pdf - All Documents (sharepoint.com)

CGIAR (2018). *Annual Report of the Platform for Big Data in Agriculture*. CGIAR Advisory Services (CAS) Secretariat - Annual Report 2018.pdf - All Documents (sharepoint.com)

CGIAR (2019). *Annual Report of the Platform for Big Data in Agriculture*. CGIAR Advisory Services (CAS) Secretariat - Annual Report 2019.pdf - All Documents (sharepoint.com)

CGIAR (2020). *Annual Report of the Platform for Big Data in Agriculture*. CGIAR Advisory Services (CAS) Secretariat - Annual Report 2020.pdf - All Documents (sharepoint.com)

CGIAR (2021). *One CGIAR Operational Structure*. February 18, 2021

Corbin, J., & Strauss, A. (2008). *Basics of Qualitative Research: Techniques to Developing Grounded Theory*. 3rd ed. Los Angeles: Sage publications.

Jin, X., Wah, B.W., Cheng, X. and Wang, Y. (2015). Significance and challenges of big data research. *Big Data Research* 2(2):59-64.

Kitchin, R. (2014). Big Data, new epistemologies and paradigm shifts. *Big Data and Society* 1(1):p.2053951714528481

Laney, D. (2001). 3-D Data management: Controlling data volume, variety and velocity. *META Group File*, 949. <http://blogs.gartner.com/doug-laney/files/2012/01/ad949-3D-Data-Management-Controlling-Data-Volume-Velocity-and-Variety.pdf>

Madin, J.S., Bowers, S., Schildhauer, M.P. and Jones, M.B. (2008). Advancing ecological research with ontologies. *Trends in Ecology and Evolution* 23(3):159-168.

Mockshell et al. (2021). CGIAR Platform for Big Data in Agriculture. Inspire Challenge Review (2017-2020). Inspiring the next generation of digital innovations in food systems through bridging institutions: Where do we go from here?

Rapley, T. (2007). Doing Conversation, Discourse and Document Analysis. *Qualitative Research Kit*.

Wilkinson, M. D., Dumontier, M., Aalbersberg, I. J., Appleton, G., Axton, M., Baak, A., ... & Mons, B. (2016). The FAIR Guiding Principles for scientific data management and stewardship. *Scientific data*, 3(1), 1-9. <https://doi.org/10.1038/sdata.2016.18>

Databases and Excel Documents

CGIAR. *2020 Partners and projects they relate to. BigData Partners Leading Projects. 2020. Partners and projects they relate.xlsx* ([sharepoint.com](#))

CGIAR. *2020 Staffing and Partners. Platform Secretariat. 2020. Partners and projects they relate.xlsx* ([sharepoint.com](#))

CGIAR. *2020 Staffing and Partners. CGIAR Focal Points. 2020. Partners and projects they relate.xlsx* ([sharepoint.com](#))

CGIAR. *Process Mapping - Stakeholders, data and tools. Process mapping - Stakeholders, data and Tools (Reacties).xlsx* ([sharepoint.com](#))

Websites

CGIAR Platform for Big Data in Agriculture. *About the Platform. About the Platform | CGIAR Platform for Big Data in Agriculture*

CGIAR Platform for Big Data in Agriculture. *Our Communities of Practice. Communities of Practice | CGIAR Platform for Big Data in Agriculture*

CGIAR Platform for Big Data in Agriculture. *Our Team Members. Team Members | CGIAR Platform for Big Data in Agriculture*

Annex 2: Evaluation Matrix

The evaluation team revised the sub-questions retrieved from the ToRs.

Key Evaluation Questions	Sub-Questions	Indicators /Evidence	Data collection methods
Relevance			
1. To what extent are the Platform's objectives relevant to the needs of its internal and external partners and stakeholders, including end-users in target groups?	1.1 Were the Platform design and approaches aligned with Centers, partners and end users' priorities and capacities?	<ul style="list-style-type: none"> - Internal and external Partners' opinion about alignment of the Platform objectives with partners' priorities and capacities. - Internal Stakeholders indicate that the Platform rationale is coherent with applications of big data in agriculture research for development. - Evidence indicates that the design was appropriate to allow synergies with 3 other CGIAR platforms - Stakeholders confirm that the Platform is relevant in comparison to what is/was already available in other scientific groups in agriculture or other domains. 	<ul style="list-style-type: none"> - KIIs/FGDs (Partners & Platform G&M team) - Online Surveys (Partners including CoP members) - Documents Analysis/ Synthesis of Evaluative Evidence
	1.2 To what extent have cross-cutting themes (Gender, Youth, Climate Change, Capacity Development) been considered in Platform design?	<ul style="list-style-type: none"> - Number (and timeliness) of guidelines/strategies about the integration of cross cutting themes. Also, level of implementation (based on action plans). - Coherence between Platform design and CGIAR cross cutting themes strategies and guidelines. - Number (and evolution over the years) of specialized partners engaged by the Platform to strengthen relevance and effectiveness of cross cutting themes integration across program levels: design, implementation, monitoring and evaluation. 	<ul style="list-style-type: none"> - Desk Review - Documents Analysis - KIIs/FGDs - Case studies (Inspire Projects) - Publications relating to these themes, enabled by the Platform
	1.3 How flexible is the Platform's design and mechanisms to local and evolving constraints including COVID-19 Pandemic?	<ul style="list-style-type: none"> - Stakeholders confirm that the Platform design allow for flexibility to achieve future and further development of the Platform / implemented technologies are flexible enough to allow upgrading and evolution depending on new technologies and new desired features, and new concepts. - Decisions were taken and implemented in a timely fashion to respond to the evolving context, needs, including COVID-19 Pandemic (examination of the timeline of decision-making process and its implementation). 	<ul style="list-style-type: none"> - KIIs/FGDs - Online Surveys - Desk Review / Documents Analysis
Efficiency			
2. Have resources (funds, human resources, time, expertise etc.) been allocated strategically and timely to achieve	2.1 How adequate has the technical, institutional, and administrative support from the Platform's CGIAR internal partners been?	<ul style="list-style-type: none"> - Platform management's testimonies about partners' support: strengths and weaknesses. - Partners' opinion about Platform capability to manage resources and partners (agile management). 	<ul style="list-style-type: none"> - KIIs/FGDs (Partners & Platform G&M team) - Online surveys - Desk review

Key Evaluation Questions	Sub-Questions	Indicators /Evidence	Data collection methods
Platform outcomes?	2.2 How efficient was the implementation: use of resources, timeliness?	<ul style="list-style-type: none"> - (%) of planned outputs achievement across the three modules. - Number and length of delays to achieving outputs. - Availability. timeliness for decision making and quality of progress reports. - Stakeholders' feedback about the quality of outputs in relation to each objectives and targets for each module. - Stakeholders' satisfaction about their level of participation of achieving in contributing to the objectives and the planned outputs. 	<ul style="list-style-type: none"> - Desk Review - Document Analysis - KIIs/FGDs (Platform G&M)
	2.3 Were the resources allocated to integrate cross cutting themes sufficient to reach the desired outcomes?	<ul style="list-style-type: none"> - (%) of budget and resources (expertise, staff time...) exclusively allocated to address integration of cross cutting themes. 	<ul style="list-style-type: none"> - Desk Review (Budget & Workplans) - KIIs/FGDs
Effectiveness			
3 To what extent did the Platform achieve progress towards outcomes?	3.1 To what extent did the Platform achieve progress on the outcomes noted in the proposal?	<ul style="list-style-type: none"> - Evidence showing that outputs have led to planned (unplanned) changes. - Stakeholders' perception about Platform evidenced effects on the digital agriculture ecosystem. - Evidence showing no discriminated outcomes based on gender, age, regions, sector... - Evidence shows that the Platform enabled Centers to comply with CGIAR's Open Access and Open Data Management (OA/DM) Policy: e.g. improvements in organizational data policy and its implementation. increased familiarity with OADM policy. - Stakeholders' testimonies and results of the synthesis of evaluative evidence about limiting and contributing factors. Stakeholders' opinion about how effective has the Platform been in identifying opportunities for targeting digital innovation in pursuit of policy and institutional reform globally. - Projects initiated/supported by the Platform show contribution to digital innovations for research and/or delivery of research. 	<ul style="list-style-type: none"> - Desk Review/Document analysis (<i>Externally generated documents</i>) - Online Surveys (Partners, CoP members + CGIAR) - KIIs/FGDs - Results from GARDIAN and SCiO re: open data and publications over time, licensing regimes over time...
	3.2 Has the Monitoring, Evaluation and Learning (MEL) system facilitated (or not) achievement?	<ul style="list-style-type: none"> - Evidence showing that Platform Monitoring system has informed timely and agile decisions making list of threats & risks/opportunities that have been identified and addressed. - Evidence showing that Platform Evaluation has informed about the worth and merit of Platform design and implementation. - Evidence showing that Platform Learning processes have enhanced design, implementation, and collective learning. 	<ul style="list-style-type: none"> - Desk review/Document analysis (<i>MEL reports, Annual reports, data sharing agreement templates, resources available</i>)

Key Evaluation Questions	Sub-Questions	Indicators /Evidence	Data collection methods
			<p>via <i>GARDIAN</i> and <i>Big Data</i> web page -- e.g. responsible data guidelines)</p> <ul style="list-style-type: none"> - KIIs/FGDs
<p>1. How effective has the Platform been in building digital capabilities and partnerships supporting CGIAR research?</p>	<p>4.1 To what extent has the Platform accelerated partners' progress towards better data and knowledge management and stewardship?</p>	<ul style="list-style-type: none"> - Platform demonstrates increased performance over the years with regards to: Searches for data, joint publications based on co-curated data, invitations to host panels at conferences, expressions of interest in online courses via the big data platform. - Evidence shows that number of jointly published articles and citations of co-designed research assisted by the platform has increased over the years; Number of publications acknowledging the Big Data Platform. - Stakeholders confirm that outputs have contributed to enhancing CGIAR and partners' capacity to deliver big data management, analytics, and ICT-focused solutions to CGIAR target geographies and communities. - Evidence shows that the Platform has strengthened capacities to store and maintain sequence data according to the FAIR principles. - GARDIAN Performance analytics of a representative sample of publications (articles and data sets) shows: a sustained positive progress against GARDIAN FAIR METRICS and that the progress is balanced among centers, regions and sectors/research topics (CRPs). - Evidence shows positive progress on: GARDIAN traffic, data use, users' satisfaction, increasing evolution of number of articles and data sets published. - Users' feedback is positive about the time needed to find the data looked for, and how convenient/practical it is when uploading/creating a dataset (and its metadata). - Evidence about incentives and capacity building efforts to reduce gaps to foster meta data publication in GARDIAN in support of cross-cutting themes of gender and youth empowerment. - Stakeholders' feedback about relevance and effectiveness of third parties' providers in GARDIAN around data gathering, data co-curation and data analysis and management through ability of the platform to integrate applications of artificial intelligence, SMS machine and remotely sensed data. - Evidence shows that the Platform enabled external partners to have their data searchable alongside CGIAR data via GARDIAN: the number of external repositories made discoverable via GARDIAN. - Evidence of big data platform optimizing repetitive tasks in agriculture research for development through exploration of open source software applications (e.g. R and Python). 	<ul style="list-style-type: none"> - Online Surveys - Desk Review/Document analysis - KIIs/FGDs - Platform analytics (GARDIAN, CG Labs)

Key Evaluation Questions	Sub-Questions	Indicators /Evidence	Data collection methods
	4.2 To what extent has the Platform enabled CGIAR to engage with the wider Agriculture data (and innovation) digital ecosystem in terms of both depth of engagement and reach?	<ul style="list-style-type: none"> - Evidence shows that the Platform enabled (or not) the expansion of external engagement in technical communities of practice to stay abreast of digital innovations related to CGIAR research domains. - Number and type of new partnerships initiated by the Platform that have strengthened CGIAR engagement with the wider Big Data communities. Among them (%) and types¹² of specialized in cross cutting themes. <i>Conventions:</i> - Evidence that the Platform conventions have opened the way to build partnerships that leverage CGIAR expertise to shape the future of digital agriculture. - Number of regional/national partnerships and associated resource commitments reported to be initiated thanks to the conventions and Stakeholders’ testimonies about new partnerships actual and/or potential effects on fostering positive outcomes <i>Communities of Practices (CoPs)</i> - Evidence show a positive and sustained Progress over the years on expansion of CoPs: members, type of members, sectors, gender balance, youth, regions, centers involved in co-designed research and joint publications. - CoPs’ members satisfaction is high about their engagement. - Uptake and use of CoPs’ outputs and reports by CGIAR and CoP members - Evidence shows solid¹³ networks’ building capabilities of the Platform and leadership around digital agriculture topics of interest, data repositories and protocols that support linked data and analysis. <i>NARES</i> - Evidence that NARES requested platform capabilities to pilot monitoring tools 	

¹² CSOs/NGOs, Government, Private Sector, Universities...

¹³ Principles in evaluating the worth and merits of networks: Durability of Network Institutions: As Scheuch (1993) notes, working together in a successful network causes a specific form of dependency that stabilizes the network and helps develop new joint goals. The evaluation has to check whether the network members have already developed such a strategic dependency. Production of trust: All networks have to produce faith in cooperation and ensure the willingness of every single member to deliver the necessary and promised goods and services. Without such belief in trustworthy cooperation on the part of all members, the network cannot survive. Evaluations should carefully investigate whether the production of trust is working fairly well, or whether there are any threats or risks to it. Institutionalization of network rules: All networks - and all kinds of corporations - need rules that have to be at least informally agreed upon by all network partners. To protect the network from being overtaken by external actors, at least some of these rules (e.g. membership, access to shared resources, use of infrastructure, etc.) must be institutionalized. One task of evaluating a network is to check on the development of such basic rules and to what extent they have become institutionalized (including by sanctions and controls). Strategic dependency: As Scheuch (1993) notes, working together in a successful network causes a specific form of dependency that stabilizes the network and helps develop new joint goals. The evaluation has to check whether the network members have already developed such a strategic dependency.

Key Evaluation Questions	Sub-Questions	Indicators /Evidence	Data collection methods
	4.3 New knowledge and innovations: To what extent has the Platform contributed to digital innovations for research and delivery of research through the Inspire initiative?	<ul style="list-style-type: none"> - Evidence of NARES requesting data, models or case studies supported by platform capabilities. - Stakeholders' feedback about the Inspire Challenge as opening ways to handle big data relevant to agriculture for the benefit of poor smallholder farmers. - Number of examples (e.g. upscale) that inspire how big data can deliver development outcomes. - Stakeholders feedback about opportunities and challenges that have influenced the results. - Stakeholders feedback about process weaknesses and strengths. 	<ul style="list-style-type: none"> - Platform analytics - KII/FGD - Desk Review/Document analysis - Online surveys - Online course curriculum
	4.4 To what extent has the Platform catalyzed the development of new digital methods for research or delivery of research at CGIAR?	<ul style="list-style-type: none"> - Evidence shows new /improved digital methods and innovations such as use of sensors for water or crop yield studies initiated by the Platform for research or delivery of research. - Evidence of data reuse strategies, including uptake and use of Platform data and tools disaggregated by stakeholder groups. - Evidence of platform incubating project proposals based on center co-design - Systematized and established cross cutting capabilities to use CGIAR data - Part of CGIAR research and development outputs clearly mention using the Platform. - Part of the literature in the domains addressed by CGIAR and the Platform that make reference to the Platform usage. - Evidence shows the Platform investments equipped CGIAR with new cross-cutting capabilities to use its data to address commonly posed research questions regarding agriculture, climate, and food systems. - Evidence shows that the Platform investments make more data available for agricultural analytics, and facilitate the use of these data. - CRPs and centers increased use of data available for analytics. 	<ul style="list-style-type: none"> - Document Analysis/Synthesis of Evaluative Evidence. - KIIs/FGDs - Online surveys
	4.5 To what extent has the Platform helped change CGIAR culture and practice regarding responsible, ethical data collection, management, and analysis?	<ul style="list-style-type: none"> - Evidence that the platform instigated the development ethics framework for data collection, generation, sharing and analysis. - Uptake of Platform tools by internal and external stakeholders. - Changes in CGIAR centers and CRPs practices that are related to a responsible use of data collection, management, and analysis. (Reference: CGIAR policy on OA/OD and CGIAR Intellectual Asset Policy) - Evidence that NARES or CGIAR centers developed cost-effective and time sensitive data collection approaches based on innovations in research methods made possible by the platform. - Big data ethics framework covers the use of sensors, remote sensing, machine data and artificial intelligence. 	<ul style="list-style-type: none"> - Platform analytics - KII/FGD - Desk Review/Document analysis - Online surveys

Key Evaluation Questions	Sub-Questions	Indicators /Evidence	Data collection methods
	4.6 What outputs from the Platform target enabling CGIAR to manage potential legal or reputational risk regarding data privacy and security?	- Stakeholders' perception of Platform outputs' relevance and effectiveness in reducing the legal and reputational risk regarding data privacy and security.	- Platform analytics - KII/FGD - Desk Review/Document analysis - Online surveys
	4.7 To which extent are the Platform's quality control mechanisms improving (or not) the discoverability of data?	- Evidence shows that the Platform improved the discovery, visibility, annotation and management of data in accordance to FAIR principles	- Platform analytics - KIIs
Sustainability			
5	To what extent are the Platform products and communities positioned to be effective in the future, seen from the perspectives of scientists and of the end users of digital agriculture products and innovations?	5.1 To what extent do the internal and external stakeholders value the Platform and seek continuity of its programmatic elements?	- Internal and external Stakeholders' opinion about the relevance of the Platform and value their engagement with the Platform modules and that capacities built in by partners ensure sustainability of results - Level of involvement/ collaboration /adoption etc. between the Platform and initiatives on standards, platform initiatives Open Science ¹⁴
		5.2 To what extent does the Platform position CGIAR with a leadership voice in digital agriculture in the eyes of its international partners?	- Stakeholders' opinion about the CGIAR preparedness to play a leadership role in the digital agriculture landscape. - Sustainability and quality of the Online course curriculum and delivery capacity - Stakeholders testify to the overall inclusiveness of the platform in data searches, open sources applications and searchability.
6	To what extent would the Platform outputs outlive the existence of the Platform in relation to the Initiatives of One CGIAR?	6.1 What Platform-generated insights, products, and communities have contributed to the One CGIAR reform/reorganization?	- Platform-generated artefacts, policies, products, communities, and approaches that have been integrated into One CGIAR? - Lessons learned to facilitate the translation of Platform's outputs and outcomes to CGIAR's way of working 7- Making the Digital Revolution Central?

¹⁴ such as EOSc, Research Data-Alliance, GEOSS (link with GeoGLAM for example), OGC and OGC/DWG in agriculture, W3C groups, GODAN, and recent or ongoing EU projects such as AgInfra.eu (now aginfra plus).

Annex 3: Big Data in Agriculture Platform Stakeholders

Table A3.1: Stakeholder Mapping of the CGIAR Platform for Big Data in Agriculture

Category	Stakeholder type	Stakeholder name	Composition	N	Role
Leadership, Management and Governance	CGIAR	CGIAR System Council & Funders	Representatives of funders and developing countries. 20 voting members, one (or two) leadership ex-officio non-voting member(s), 6 ex-officio non-voting members and two active observers	30	Keep under review the strategy, mission, impact and continued relevancy of the CGIAR System.
Leadership, Management and Governance	CGIAR	CGIAR System Board	8 voting and 2 non-voting ex-officio members	10	Keeps under review the effectiveness of the CGIAR System, its reputation for excellence, and adopts and monitors compliance with CGIAR policies, procedures, and guidelines, with a view to ensuring results and the continued relevance of CGIAR's agricultural research for development.
Leadership, Management and Governance	CGIAR	The One CGIAR Portfolio Performance Management Team	Three members of the Executive Management Team (EMT), leadership of the three Science Groups, of the six Regional Groups and of the five Impact Area Platforms + the Global Director for Business Operations and Finance	18 (TBC)	Advise on the overall CGIAR research and innovation portfolio
Leadership, Management and Governance	CGIAR	MD, Institutional Strategy and Systems, Global Director, Digital Services.	5 functional areas, 25 units	30	Support sourcing, maintenance, and harmonization of IT infrastructure. Responsible for holistically leading enterprise-level digital service provision and upgrades and will also support digital activities in the Science Groups.
Leadership, Management and Governance	TBD	Initiative Design Teams (IDTs)	TBD	TBD	TBD
Leadership, Management	CGIAR	Project Coordination, Monitoring	A small global team (2-3 FTEs + a tasked global team)	TBD	Support successful delivery of CGIAR Initiatives and bilaterally funded projects

Category	Stakeholder type	Stakeholder name	Composition	N	Role
and Governance		and Performance Management Unit			throughout the project lifecycle, across all three Science Groups. Support to team-building, work planning and budgets, adherence to contracts, compliance to CGIAR and external performance standards, monitoring and reporting within CGIAR systems and final close-down of projects.
Leadership, Management and Governance	CGIAR	Big Data Platform Secretariat	2 Platform leaders, 1 Platform coordinator, one Module 1 leader, a program manager, a project manager, a communication coordinator and a program administrative and financial analyst	8	Management of the activities of the Platform. In charge of quotidian decision making. Monthly management meeting with CoP coordinators as observers.
Leadership, Management and Governance	Mixed (CGIAR and non-CGIAR members)	Big Data Platform Steering Committee	A permanent member from CIAT and IFPRI, a permanent CGIAR System Office representative, three 2-year rotating partner representatives (funder, private sector, research), one 2-year rotating Center representative, one 2-year rotating CRP representative + Platform leaders and coordinator as observers	8	The purpose of the steering committee is to provide oversight and direction to the CGIAR Platform for Big Data in Agriculture, ensuring that it meets the objectives laid out in the Platform proposal in an efficient and effective manner. Makes high-level programmatic decisions.
Leadership, Management and Governance	External to CGIAR	International Advisory board	Members of the FAO, GODAN, Google, Marz Inc., GIZ and AG Gateway	6	Carry-out regular high-level examinations of how the Platform is connecting with other similarly-themed global and regional efforts. To ensure the objectivity of the IAB, members may not be employed by CGIAR, nor currently be serving in any other roles with the Platform.
Leadership, Management and Governance	CGIAR	Big Data Focal Points in all CGIAR Centers	One person per each CGIAR center	15	TBC

Category	Stakeholder type	Stakeholder name	Composition	N	Role
Partnership	CGIAR	CGIAR partners involved in generating and use of CGIAR knowledge products	Representatives of CGIAR centers	15	Can make decisions to improve the Platform. Can access and provide information to facilitate research in agriculture.
Partnership	CGIAR	CGIAR Communities of Practices (CoPs)	7 Communities of Practice and CoP coordinators	7	Can access and provide information to facilitate research in agriculture.
Partnership	Academia	Various partners	E.g WUR, University of Twente, Makerere University	26 (TBC)	Can access and provide information to facilitate research in agriculture
Partnership	International organizations	Various partners		9 (TBC)	Can access and provide information to facilitate research and policy making in agriculture
Partnership	Private sector	Various partners		16 (TBC)	Can access new capabilities and integrate these into how they do business
Partnership	Research institutes	Various partners		11 (TBC)	Can access and provide information to facilitate research in agriculture
Partnership	Governments	Various partners		2 (TBC)	Can access and provide information to facilitate research and policy making in agriculture
End Users	CGIAR	Users of GARDIAN, AGROFims, CGIAR Expert Finder, CoP outputs	CGIAR Centers	TBD	Access to shared infrastructure, including common infrastructure and analytics Platform, cloud storage and backup, high-end analytics capacity and processing infrastructure
End Users	CGIAR	Users of GARDIAN, AGROFims, CGIAR Expert Finder, CoP outputs	CRPs	TBD	Access to shared infrastructure, including common infrastructure and analytics Platform, cloud storage and backup, high-end analytics capacity and processing infrastructure. Facilitated access to CGIAR data products, including interoperability opportunities with CRP-developed data Platforms.
End Users	CGIAR	Users of GARDIAN, AGROFims, CGIAR Expert	Genebank Platform	TBD	Environmental datasets to add value to germplasm passport information; contribution to concept of Digital Genebank

Category	Stakeholder type	Stakeholder name	Composition	N	Role
		Finder, CoP outputs.			
End Users	CGIAR	Users of GARDIAN,	Genetic Gains Platform	TBD	Access to processing infrastructure for genetic data and bioinformatic analysis
End Users	Academia and Research	Users of GARDIAN, AgroFims, CGIAR Expert Finder, CoP outputs.	Universities and research institutes	TBD	Access to GARDIAN Platform
End Users	International Organizations	Users of GARDIAN	International Organizations and NGOs	TBD	Access to GARDIAN Platform
End Users	Private sector	Users of GARDIAN	Private firms and start-ups	TBD	Access to GARDIAN Platform
End Users	Governments /Policy makers	Users of GARDIAN	Policy makers	TBD	Access to GARDIAN Platform
End Users	Farm households	Users of GARDIAN	Farm households	TBD	Access to GARDIAN Platform
End Users	Others	Users of GARDIAN	Any other user	TBD	Access to GARDIAN Platform
End users	CGIAR	Participants to the convention	Participants belonging to CGIAR Centers	320	Attended the online 2020 convention
End users	Academia and Research	Participants to the convention	Participants belonging to Academia and Research centers	407	Attended the online 2020 convention
End users	Private sector	Participants to the convention	Participants belonging to private firms	286	Attended the online 2020 convention
End users	Governments /Policy makers	Participants to the convention	Participants belonging to government	143	Attended the online 2020 convention
End users	NGO	Participants to the convention	Participants belonging to NGOs	143	Attended the online 2020 convention
End users	Various (CGIAR and non CGIAR)	Members of the CoPs	5000 members of the 7 communities of practice	5000	Key means to identify sector bottleneck issues and develop digital research innovations.
End users	External to CGIAR (TBC)	Winners of the "inspiring challenge"	All winners of the inspiring challenge (2017-2020)	32	Development of innovative ideas for agriculture
End users	External to CGIAR (TBC)	Applicant to the "inspiring challenge"	All applicants to the inspiring challenge (2017-2020)	526	Application to propose innovative ideas for agriculture

*TBC: to be confirmed

*TBD: to be defined

Annex 4: Desk Review - Platform Cross-Cutting Themes

This section presents the background and progress made by the Big Data Platform regarding the integration of cross cutting themes over the years of program implementation. Information was retrieved and summarized from the Platform annual reports and the 2016 Proposal as well as other sources.

1. Gender

Big data and ICT solutions were envisaged to contribute to CGIAR's gender IDOs. In the proposal, the Platform was expected to take leadership in bridging the gap of the technology world being male dominated. Gender sensitive approaches were identified as an emphasized element of the Platform's capacity development strategy. Datasets made open access through Module 1 activities and their metadata were expected to represent the gender dimension with gender-disaggregation data wherever applicable. This was to be achieved in collaboration with the CGIAR Community of Practice on Gender. Elements of the annual convention under module 1 were envisaged to focus on gender related topics. Female participation at the convention was also to be incentivized to help break typical male-dominated technology barriers. Some Inspire project topics were to be targeted specifically to address gender gaps and innovate around big data and ICT means of reaching marginalized women farmers and female-headed households. Inspire challenge projects on other topics, as well as impact evaluations would be expected to examine gender-related impacts of the innovations. Among the topics that the Steering Committee was expected to select for prioritization of projects under module 3 was "Opportunities to close gender-gaps through big data analytics and ICTs targeted for women and youth". The estimated annual budget to address gender considerations was USD 450,000.

The Platform reported an inability to explicitly address gender as a cross-cutting dimension in 2017. The table below highlights some of the reported progress of gender mainstreaming efforts from 2017 to 2020

Table A4.1: Highlights of the Platform's Reported Progress on Gender Mainstreaming (2017-20)

Year	Highlights of the Platform's reported progress on gender mainstreaming
2017	A working group on gender formed under the Socioeconomic CoP in module 2.
2018	Explicit attention given to encouraging women to attend all capacity development events at the annual convention with 30% of speakers being women and the total female participation being 34.9% Proposal entries for the year's Inspire Challenge explicitly assessed on the gender dimension, with effective and persuasive attempts being rewarded 7,060 publications related to gender being discoverable through GARDIAN, and 124 datasets having an explicit gender-related dimension Design session at the annual convention to assess how new data types might be leveraged beyond surveys to address gender dimensions
2019	Showcasing of ground-breaking gender research methods that leverage telecom data undertaken in collaboration with the GENDER Platform Annotation, discovery, and re-use of gender disaggregated data becoming a pillar of the Platform's data strategy and to inform future collaboration with the GENDER Platform. Platform management team nominating a gender focal point and prioritizing the creation of an official gender strategy document Requesting a gender balance of proposal teams and the detailing of a gender equality mainstreaming hypothesis for projects proposed in the Inspire challenge. 80% of Inspire Challenge proponents including a gender component in their proposals, up from 70% in 2018.
2020	GARDIAN used as a source of CGIAR data and/or publications by the GENDER Platform as an enhancement to webpages Four-pronged gender strategy developed and confirmed by the steering committee Collaborative research with the GENDER Platform on the development of a novel, timely, large-scale assessment of women's economic empowerment completed and published Co-funded with GENDER an extensive review of the intersection of human-centered design with social inclusion and digital agriculture.

Year	Highlights of the Platform's reported progress on gender mainstreaming
	Addition of rigorous gender mainstreaming components to Inspire Challenge and Rapid Response Grants

2. Capacity Development

During proposal development, capacity development was deemed central to the impact pathways of the Platform as a whole. Capacity among individuals to manage and use big data was deemed pivotal, for greater organizational capacity to solve problems in the CGIAR mission using big data. By the time of the Platform proposal, analytics of big data was not a mainstream research approach in CGIAR. The Platform's strategy of capacity enhancement was intended to address the full theory of change across the three Modules. The strategy envisaged focus on five among the nine elements of the CGIAR CapDev framework. Capacity development was deemed inherent in Module 1. The use of innovative learning approaches was particularly emphasized for increasing data management capacities through this module. Module 2 was considered to emphasize three elements of the CGIAR CapDev framework, namely - Gender sensitive approaches, institutional strengthening, and organizational development. Capacity to innovate and gender sensitive approaches were deemed to be emphasized through Inspire Projects in Module 3. The table below illustrates this emphasized focus on five elements across the Platform's modules.

Table A4.2a: Elements in the CapDev Framework where focus was to be emphasized in the Platform Modules.

CapDev Element / Module (X for emphasized focus)	Organize (M1)	Convene (M2)	Inspire (M3)
Design and delivery of innovative learning materials and approaches (#2)	X		
Gender-sensitive approaches (#5)	X	X	X
Institutional strengthening (#6)	X	X	
Organizational development (#8)	X	X	
Capacity to Innovate (#10)	X		X

The Platform envisaged linkages of capacity development activities across its three modules and working across Centers and CRPs for increased effectiveness and efficiency. It planned to stimulate the incorporation of state-of-the-art Big Data management and analytics into CGIAR research as well as develop new tools and approaches for use within both CGIAR and partner institutions. A series of capacity-building activities were envisaged, especially for the tools and approaches that may not be self-explanatory. As the technology world is particularly male dominated, the Platform planned to take leadership in bridging the gap to build the capacity of women in particular during training sessions.

The Platform's capacity development efforts would be at individual, organizational and institutional levels of capacity development, and with both researchers and research users targeting both introductory and advanced levels. Downstream capacity development activities were left to boundary partners, owing to its resource limitations. Topics expected to be covered in training events included big data management, data publication, and data visualization and analytical tools, ICT-based survey tools, and open -source hardware Platforms. The estimated annual budget for capacity development was USD 1,954,000.

The table below highlights some of the reported progress of capacity development activities between 2017 and 2020.

Table A4.2b: Highlights of the Platform's Reported Progress on Capacity Building

Year	Highlights of the Platform's reported progress on capacity building
2017	Platform focal points, several Data Managers, and an array of researchers at CGIAR gaining new insights on the challenges and opportunities of attaining FAIR principles with CGIAR data at the annual convention

Year	Highlights of the Platform's reported progress on capacity building
2018	Funds under module 1 to centers linked to capacity building disbursed 34 trainings and 18 data sprints among funded activities at CGIAR centers Capacity building efforts on big data analytics and relevant technology tools conducted by Working Groups and CoPs under Modules 1 and 2, including at the annual convention
2019	Hands-on "data sprint" workshops by Centers to promote best practices in managing and uploading data assets towards open, FAIR, and ethical outcomes Development of a self-paced online course outlining good practices in creating FAIR data and ethical data management throughout research lifecycles. All Inspire challenge applicants receiving feedback on linkages to digital research and impact with 10 finalists receiving coaching from an external expert panel More than 4,000 researchers reached with capacity building efforts
2020	Data science academy with 25 CGIAR scientists on the Coursera Platform piloted Cumulatively, 43 webinars being delivered by CoPs, covering relevant topics such as scaling digital innovations and integrating digital survey tools into research Content for a popular agriculture advisory TV show developed by the Inspire Challenge project "Let it rain" A total of 72 partnerships formed or brokered, linking CGIAR with new capabilities.

3. Climate Change

In the Platform proposal, climate change/variability was enumerated among the pressing challenges of our time for which data was helping accelerate the development of robust responses. The Platform was envisaged to contribute to improved climate change foresight. Ensuring standards compliance on climate change was envisaged as a linkage needed under module 2. This was particularly to enhance discoverability and interoperability of the data in existing CGIAR efforts such as the CCAFS Climate Data Portal. A second climate change linkage under module 2 was with the network of micro-climate sensors at trial sites of CGIAR and partners. This was more so considering the then unexploited potential to aggregate field-measured crop health and environmental data from across CGIAR trial sites to become shareable through open Platforms in real-time and linkable with climate change analytics. Under module 2, CCAFS Flagship 1 was to be closely involved in the Community of Practice on crop modelling. It was also expected that CCAFS Flagships 2 and 4 would be involved in the Community of Practice on data-driven agronomy. A data products' working group was expected to prioritize climate-related datasets for generating new products to follow successes such as WorldClim and the CCAFS portal. Partners such as TAHMU were expected to bring significant expertise and meteorological infrastructure to the Platform. Among the specific topics where the Platform would focus under module 3 was, "Novel tool development for climate resilience planning using CGIAR data integrated with other data". In addition, areas where big data can contribute to innovation in climate mitigation or adaptation were to be identified. Such areas were to be considered by the Steering Committee for the Inspire project calls for innovations.

The Platform did not report any progress under this cross-cutting theme in 2017. The table below highlights the reported progress from 2018 to 2020.

Table A4.3: Highlights of the Platform's Reported Progress on Climate Change Mitigation and Adaptation

Year	Highlights of the Platform's reported progress on climate change mitigation and adaptation
2018	Facilitated access to seasonal forecast data from IBM Weather Company by CCAFS.
2019	New standards-driven tools for climate change research, leveraging a common pool of interpretable and interoperable data assets in a common analytic environment including a 7 Terabyte global climate dataset under module 1. Tools and datasets for examining climate impact on agriculture developed under Module 2 - including an updated weather dataset for modeling, updates to the Spatial Production Allocation Model, and research publications on managing climate impacts on specific crops and regions. A new method for precise and localized rainfall measurement that also used mobile telephone network data to make forecasts sourced and developed under module 3.

Year	Highlights of the Platform's reported progress on climate change mitigation and adaptation
2020	New collaborations on cross-cutting, unified digital capabilities for agroclimatic characterization and forecasting brokered Use of CG Labs, the analytic environment by a CCAFS team to develop climate scenarios for several crops and value chains in sub-Saharan Africa and Vietnam The use of CGIAR data with CG Labs to assess the profitability of fertilizer use on a sub-continental scale in Africa.

4. Youth

Big data and ICT solutions were envisaged to contribute to CGIAR's youth IDOs. It was also anticipated that increased access to agricultural data and ICT-based applications could help retain and attract more rural youth in agriculture. Young men and women were to be considered a major target user group for the annual data/knowledge consultations and design of communication materials. To bring new ideas to the table from among the youth, significant youth involvement from within the CGIAR and with partner organizations was envisaged both at the annual Convention and in CoPs. Some Inspire challenge project topics were expected to specifically address youth related impacts. Impact assessment efforts were also expected to look at youth-related impacts of different innovations. Addressing youth as a cross cutting theme of the Platform was allocated an annual budget of USD 350,000.

The Platform reported an inability to explicitly address the youth as a cross-cutting dimension in its six months of full operation in 2017. The table below highlights the reported progress from 2018 to 2020.

Table A4.4: Highlights of the Platform's Reported Progress on Climate Change Adaptation

Year	Highlights of the Platform's reported progress on climate change adaptation
2018	Youth-related indicators integrated into the 100Q initiative for better handling of youth-related issues in future CGIAR surveys under module 1. The new Youth In Data Initiative, leading to the engagement of young digital innovators from Africa with training on social media and journalistic data reporting, 12 of whom participated at the annual convention. Many young people participating at the annual convention including a 15-year-old high school student from New Mexico, USA being a speaker. Innovation projects supported through the Inspire Challenge yielding new data and insights into youth user behavior on digital tools.
2019	In GARDIAN, datasets from CGIAR Centers with a youth component increased from 3 in 2018 to 40. Launch of the Youth in Data Connect Platform at the annual convention, building on the 2018 Youth In Data Initiative From 80 applicants, 30 young digital innovators from engineering and journalism schools enrolled for training on data science and social media reporting; Youth reporting being attributed to engagement with many young enthusiastic agricultural data scientists, programmers and application developers at the annual convention.
2020	Youth attendance and participation at the annual convention estimated at 25% <i>Youth In Data</i> Workshop conducted in parallel with the annual convention, attracting 600 applicants and enrolling 130 youth from 49 countries Reporting by young digital innovators building on interviews of convention experts and participants attributed to reaching 14 million people via the convention's #BDPGLOBAL2020 hashtag

Annex 5: Desk Review - Intellectual Assets and Open Access

The BIG DATA proposal envisaged intellectual assets, open access and open data management issues to feature prominently in all facets of Platform implementation. Prior to the proposal, an initiative was underway with the consortium office to implement the CGIAR Open Access and Data Management Policy (OADMP) fostering change in culture and institutional incentives towards the implementation. In the proposal, Module 1 of the Platform incorporated the second phase of this initiative, envisaged to increase the volume, variety, and quality of openly-accessible research outputs from CGIAR and its partners. The module was particularly intended to support CGIAR to comply with Open access/Open Data (OA/OD) principles organization-wide as stipulated in the OADMP while embracing the power of big data analytics. A CGIAR-wide transformation and the appropriate supporting infrastructure were acknowledged as a requirement to achieve this. Research outputs hosted on the pre-existing Platforms within CGIAR (e.g. CGSpace, Dataverse, CCAFS climate) and external Platforms were expected to comply with the OADMP requirements and FAIR principles (Findable, Accessible, Interoperable, Re-usable). A range of support mechanisms were expected to support Centers and CRPs to comply with OADMP and ensure that CGIAR data was truly open access. Such mechanisms were expected to include the provision of enabling datasets, tools, and services, and a CGIAR-wide common data analytics environment. For key datasets offered under this module, the Platform was to serve as a clearinghouse for data access and management issues that may need to be addressed before making them publicly available. Privacy issues were expected to supersede open access, such that privacy sensitive data would be anonymized and/or aggregated prior to publication. The Platform was also expected to serve as an intermediary between the commercial data providers and CGIAR as a whole to negotiate the terms while pursuing the best interests of CGIAR.

Open access principles in the management of intellectual assets were prominent in the overall agenda of the annual convention and the CoPs under module 2 in the proposal. The working group on data products was expected to identify the next generation of International Public Good data products that CGIAR should be generating. The steering committee was charged with the responsibility of managing the Platform's intellectual assets in line with CGIAR's intellectual assets principles to maximize their global accessibility and impact. A regularly updated intellectual property portfolio listing the Platform's information products such as publications, databases, analysis tools, and web services was expected. All products of the Platform were to be disseminated using open access principles, under suitable open licenses that allowed maximum accessibility and reusability, and with clear branding to recognize those who produced them. The Platform was to commit to cover open access fees where applicable to make its publications open and reusable. The Platform's commitment to open access of knowledge products was expected to be incorporated in any agreements with private partners under this module. Confidentiality restrictions with respect to private and sensitive information, especially personally identifiable information were expected as well as adherence to data collection ethics. The CoPs under the module were expected to promote guidelines for ethics in research, and ensure protection of the privacy of all subjects involved in the data.

Under module 3, all agreements made with inspire projects were expected to comply with the CGIAR Intellectual Assets Principles. Sound management of intellectual assets and IP rights was to be required of these supported projects. All the outputs of the *Inspire* funded projects including data and software were to be released on open licenses that maximize global accessibility and reuse while ensuring that all data products would be machine readable, interoperable, and reusable. Risks related to privacy and cyber-security regarding personally identifiable information were also noted under this module of the Platform. As protection of individuals and their privacy superseded open access, any private data from individuals was to be aggregated and or anonymized before being made public. The inspire projects were also expected to respect Farmer rights including seeking their prior informed consent and giving appropriate credit where outputs referred to traditional knowledge. According to the Big Data Coordination Platform Full Proposal (2017-20), the estimated annual average cost of open access and data management was USD 3.2 million, being the primary aspect addressed in Module 1 across CGIAR. The annual average cost estimated for intellectual asset management was USD 163,000.

The table below highlights some of the reported progress of capacity development activities between 2017 and 2020.

Table A5.1: Highlights of the Platform’s Reported Progress on Intellectual Assets and Open Data (2017-20)

Year	Highlights of the Platform’s reported progress on intellectual assets and open access
2017	<p>Intellectual assets management</p> <ul style="list-style-type: none"> - High-level intellectual assets and data management plan, adapting aspects of the plan put in place by the CCAFs CRP - Provision of Data Management Support Pack to data managers at Centers to help the research community produce high quality, reusable, and open data from research activities. - A monthly webinar series, cross-Center groups and CoPs supported for the management and “FAIRification” of information resources <p>Open Access / Open Data</p> <ul style="list-style-type: none"> - Although Centers had committed to making their information products open and in compliance with FAIR principles, they were at different stages of planning, launching, and scaling-up these operations. - Seed funding was allocated to centers along with guidelines for acceptable use of funds. - Several Centers updated workflows and software for data sharing, and contributed more staff time to executing the OADM Policy as a result of the Platform’s support - A reported increase of discoverable publications and datasets by more than 10% at most centers was attributed to the Platform’s effort. - CeRes, a pan-CGIAR data discovery tool that enables users to create queries to search publications and data repositories at all 15 Centers was launched, making 50,000 publications and 1,800 datasets searchable <p><i>Source: Annual Report 2017</i></p>
2018	<p>Intellectual assets management</p> <ul style="list-style-type: none"> - Key assets managed by the Platform <ul style="list-style-type: none"> - All ontologies developed, - Inspire Challenge related IP - Code developed for key Platform tools (e.g. AgroFIMS and GARDIAN), - Training content. - The Inspire Challenge rules specified that any new IP among supported projects (that does not precede challenge support) should be made FAIR. <p>Open Access / Open Data</p> <ul style="list-style-type: none"> - The report of the review of CGIAR’s Open Access/Open Data policy and implementation support was released, making recommendations for improvement of the policy moving forward - Also see related progress reported under module 1 <p><i>Sources: Annual Report 2018; Review of CGIAR’s Open Access/Open Data policy and implementation support</i></p>
2019	<p>Intellectual assets management</p> <ul style="list-style-type: none"> - Operationalized agreement for a project in which a partner brought a proprietary algorithm for the Platform to effectively manage the IP <p>Open Access / Open Data</p> <ul style="list-style-type: none"> - Implemented software tool for CGIAR data managers to detect personally identifiable information inadvertently been shared on open data repositories - Also see related progress reported under module 1 <p><i>Source: Annual Report 2019;</i></p>
2020	<p>Intellectual assets management</p> <ul style="list-style-type: none"> - Entered into partnerships with digital companies in the pre-competitive space for shared interest in open, public-good science infrastructure - Retained an intellectual property lawyer with specific expertise in biodiversity and plant genetic resources to help guide efforts. <p>Open Access / Open Data</p> <ul style="list-style-type: none"> - Led revision of the 2013 CGIAR Open Access and Data Management Policy (to be finalized in 2021) - Worked with the Information and Data Managers CoP to implement an updated metadata schema for CGIAR data. - Also see related progress reported under module 1 <p><i>Source: Annual Report 2020</i></p>

Annex 6: Desk Review – Progress Towards Outputs per Module

The following graphics were developed by the evaluation team based on a review of the Platform annual reports.

Figure A6.1: Graph showing Organize Module’s Discoverable Datasets and Publications (2017-20)

Organize: Discoverable Datasets and Publications

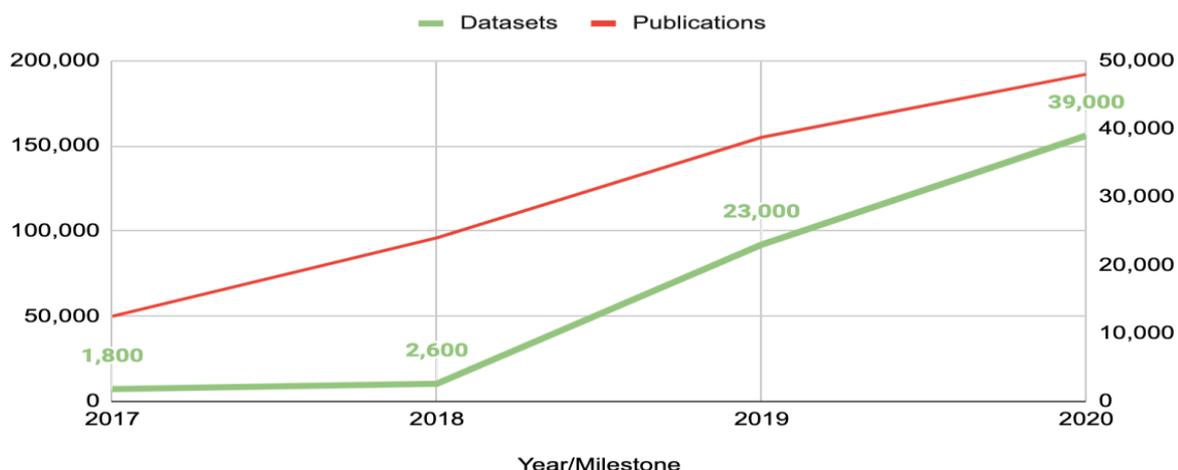


Figure A6.2: Barchart showing Percentage Attendance at Convene Module’s Annual Conventions (2017-20)

Convene: Annual Convention Attendance

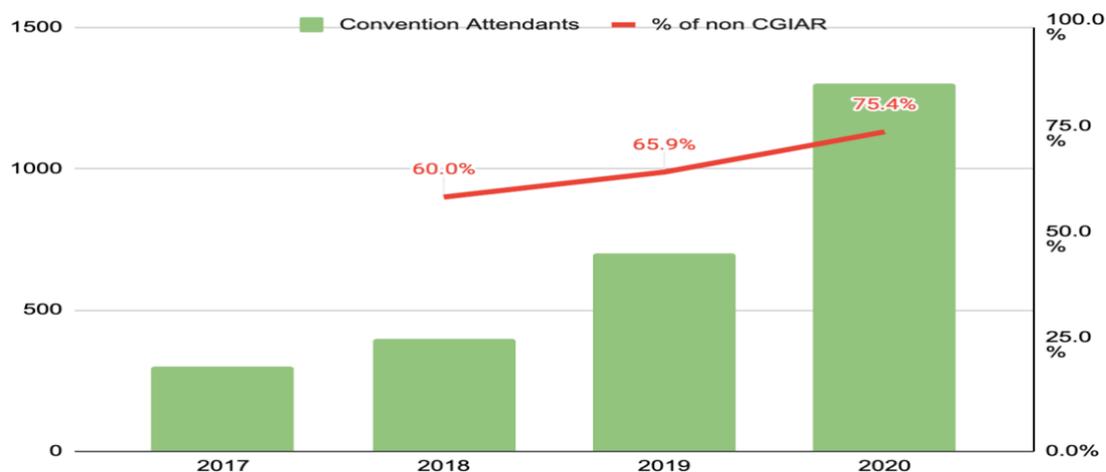


Figure A6.3: Chart showing Number of Projects Awarded Grants by Inspire Module (2017-20)

Inspire: # of Projects Awarded Grants

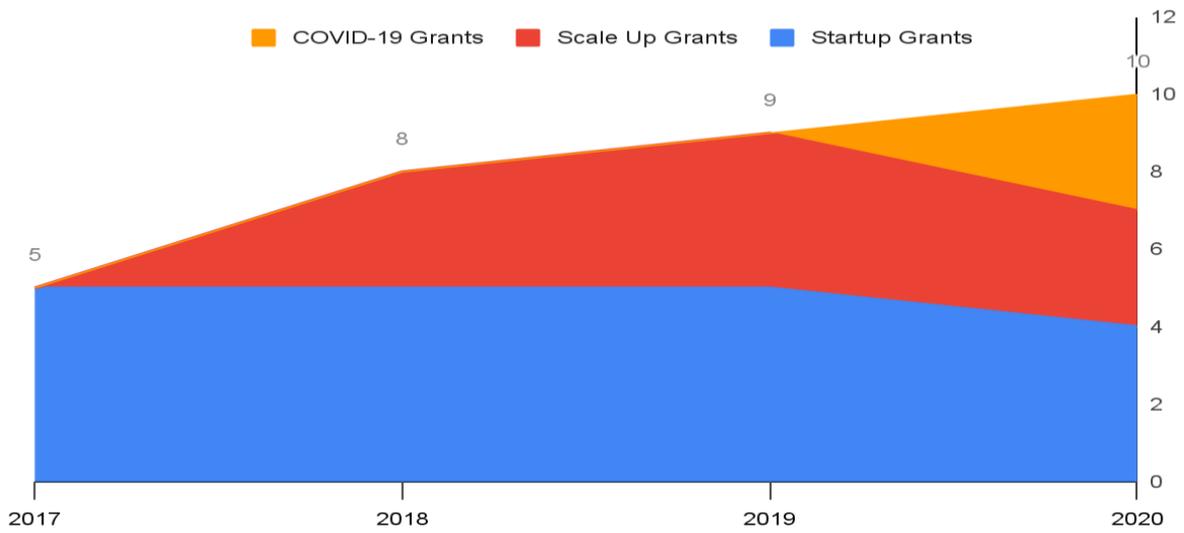
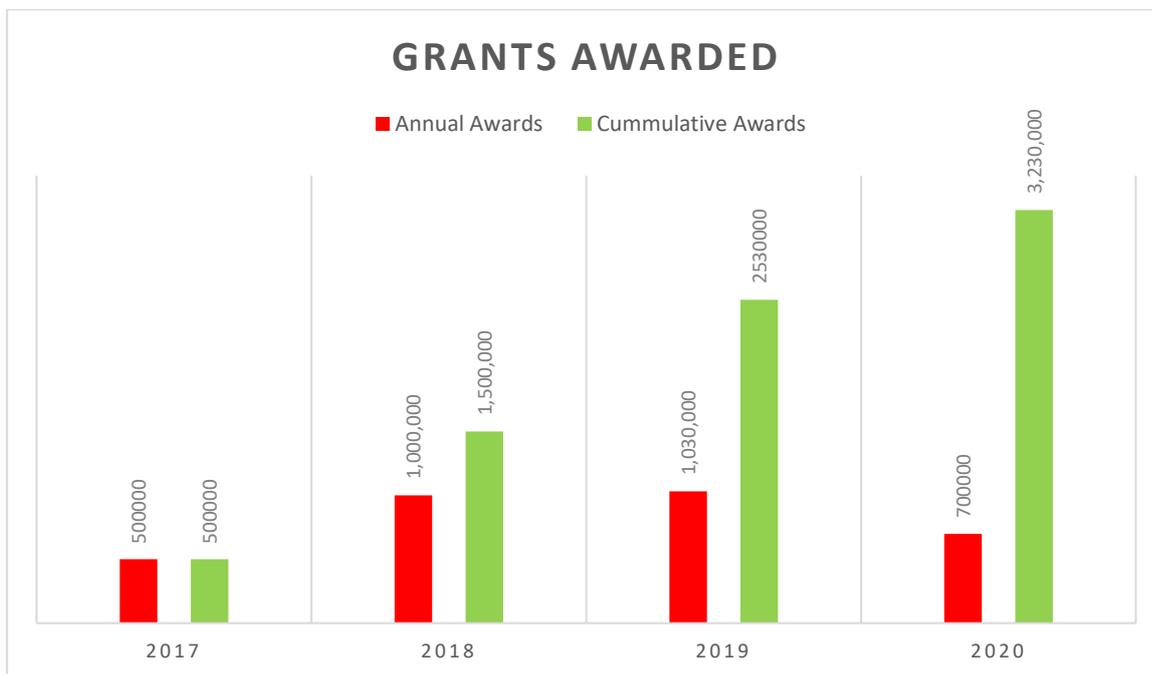


Figure A6.4: Barchart showing cumulative Grants awarded by the Inspire Module (2017-20)



Annex 7: Evaluation Team Background

Ibtissem Jouini, Team Leader



Ms. Jouini is a senior evaluator and researcher. She founded the [EvalChange](#) network in 2016: a group of independent consultants committed to making a lasting impact through their work giving special importance to the principles of gender equality, inclusiveness and human rights. Over the last years, Ms. Jouini has contributed and led numerous independent evaluations where she designed rigorous and tailored methodologies applying several qualitative methods. Previous to that, Ms. Jouini worked for international development organizations (UNDP, GIZ, USAID, AfDB) where she was involved in regional programs mainly related to the field of Governance. Ms. Jouini is a Tunisian national based in Spain.

Didier Leibovici, Subject Matter Expert



Didier Leibovici's expertise is in geospatial data analytics and after 15 years of research in leading UK universities (Oxford, Leeds, Nottingham, Sheffield), 5 years at IRD (France), 2 years at Sanofi-Recherche (France), 4 years at INSERM (France) working within interdisciplinary and international context for European research programmes with UK, France, LMIC (in Africa and South-Asia), he is setting up GeotRYcs, a geo-spatial-temporal data scientist consulting service. Didier has a PhD in Biostatistics and a Master's degree in computing-science; his scientific production in data analysis and geospatial science are on spatiotemporal data modelling and analysis within different contexts, such as epidemiology, agriculture and agro-ecological monitoring, dynamics in population studies, location-based citizen crowdsourcing of environmental information within interdisciplinary projects. Didier's interests are in challenging the potential of interoperability developments to manage cross-domains scientific models involving geospatial data from heterogeneous sources.

Erik Bongcam-Rudloff, Subject Matter Expert



Erik Bongcam-Rudloff is a [Chilean](#)-born [Swedish](#) biologist and computer scientist. He received his doctorate in medical sciences from [Uppsala University](#) in 1994 and his Docentur in 2004 at the Swedish University of Agricultural Sciences, Sweden. He is Professor of Bioinformatics and the head of SLU-Global Bioinformatics Centre at the [Swedish University of Agricultural Sciences](#). His main research deals with development of bioinformatics solutions for the Life Sciences community. He is also the director of SLU-Global Bioinformatics Centre which created [eBiotoools](#), [eBioX](#) and [eBioKit](#). Erik Bongcam-Rudloff is also executive board member of several international organisations relating to computational science and bioinformatics. He is the coordinator of [B3Africa](#), "Bridging Biobanking and Biomedical Research across Europe and Africa" which aims to implement a cooperation Platform and technical informatics framework for biobank integration between Africa and Europe.

Mathew Kurian, Subject Matter Expert



Mathew Kurian is Consortium Lead for the Belmont Forum project on cyber-enabled disaster resilience involving partners at Penn State University, Cranfield University and University of Sao Paulo besides UNHABITAT, Geneva and Ministry of Water and Irrigation, Government of Tanzania. He previously led the establishment of the Capacity Development and Governance Unit at the United Nations University (UNU) in Dresden, Germany where he launched the Nexus Observatory (an online Platform to support the monitoring of the SDGs) in collaboration with GIZ, Bonn. He has previously held staff positions at The World Bank and Consultative Group on International Agriculture Research (IWMI-CGIAR) and has served on the faculty of UNESCO-IHE, Delft and University College London, UK. His most recent book *Boundary Science* (Elsevier 2021) inspired the launch of the climate panel- an online Platform that connects data with models and engages decision makers at the level of local governments and communities in Sub-Saharan Africa: <https://www.theclimatepanel.com>.

John Kieti, Expert Information Communications Technology & Data Management



John is an exponent for social justice. He is passionate about digitalization and digital Platforms helping to solve social and economic problems. He has just over 20 years' experience in management information systems and building digital entrepreneurship ecosystems. He previously worked as a Data manager, Analyst/Programmer, Head of Information Systems, Director of Programs, and a Chief Operations Officer in various organizations. He has in the past designed and deployed information systems gathering vast data for aggregation and analysis at national levels. He led the teams organizing PIVOT East, Eastern Africa's premier conference and challenge for mobile technology startups between 2011 and 2014. He was part of the team conceptualizing the CTA's Pitch Agrihack challenge

in 2013. John has served as a technology, innovation, entrepreneurship and digital agriculture consultant for CTA, the World Bank Group, iHub, and the University of Nairobi, among other organizations. He holds an MBA and a BSc in Computer Science. He is a PhD candidate pursuing research on digital Platforms for agriculture. From this research he recently published a peer reviewed article on "*the sources of value creation in aggregator Platforms for digital services in agriculture*". John's vision is for technology, innovation and entrepreneurship to unlock the economic potential of developing countries, starting with agriculture.

Stefania Sellitti, Monitoring, Evaluation and Learning Consultant



Stefania Sellitti is a development economist with a strong background in agriculture and rural development. She worked on several research projects with CIAT and CropTrust, focusing on the empowerment of workers in coffee estates in Latin America, on the knowledge about climate change in Nicaragua and Colombia and on the impact of CIATS's Genebank and bean collection. She is currently working as teaching assistant at the NOVA School of Business and Economics in Lisbon. She has experience in Monitoring, Evaluation and Impact Assessment, both within the CGIAR, as an intern at the DG Agri of the European Commission and as an external consultant for private companies, such a Plan-Eval in Brazil and COATL in Portugal.

Annex 8: Evaluation Terms of References (ToRs)

Terms of Reference

Evaluation of CGIAR Platform Big Data in Agriculture

Draft, July 2, 2021.

1 Background

Rationale and Context of the Evaluation

In today's connected, data-rich world, big data presents tangible benefits and challenges revolutionizing the Agricultural Research for Development (AR4D) continuum as well as people's lives. The smart and effective use of data is key to unlocking and accelerating the achievement of the 2030 Agenda for Sustainable Development. Data innovations and digital tools bring critical capabilities for agile adaptation in food systems.

CGIAR's data and knowledge products should be, arguably, among its crown assets. To stay at the cutting-edge of the rapidly evolving digital world, the CGIAR invests in the curation and maintenance of these assets through a five-year (2017-2021) CGIAR Platform for Big Data in Agriculture (hereinafter, the Platform) approved by the System Council. The Platform is a coordinating mechanism to deliver a coherent data-driven and data-intensive strategy leveraging data capabilities and infrastructure. Its strategy focuses on collaboration among CGIAR Research Programs (CRPs) and Centers, leveraging external expertise to enable unrestricted discoverability of linked open datasets. "The ultimate goal of the Platform is to harness the capabilities of Big Data to accelerate and enhance the impact of international agricultural research. It will support CGIAR's mission by creating an enabling environment where data are expertly managed and used effectively to strengthen delivery on CGIAR SRF's System Level Outcome (SLO) targets."¹⁵ An overview of the Platform is summarized in Annex 1.

The CGIAR Advisory Services Shared Secretariat (CAS Secretariat) supports and facilitates the CGIAR's independent advisory services, comprising the Independent Science for Development Council (ISDC), the Standing Panel on Impact Assessment (SPIA) and an independent Evaluation Function. CAS Secretariat's Evaluation Function supports the implementation of the CGIAR System multi-year evaluation plan to meet CGIAR System's needs for rigorous high-quality independent evaluations to inform decision making across the System. As part of its 2021 approved workplan and budget, the Evaluation Function is mandated to conduct a full-fledged external evaluation of CGIAR's Big Data in Agriculture Platform.

Earlier in the year, per its mandate and approved workplan, to meet the needs of System Council represented by Strategic Impact, Monitoring and Evaluation Committee (SIMEC) On June 21, 2021, the Evaluation Function completed the Synthesis of Learning from a Decade of CGIAR Research Programs (CRPs). The high-level 2021 Synthesis pooled evidence from 43 CGIAR evaluations, reviews, syntheses, and assessments including the 2019 performance management standards pilot assessment for the Platform commissioned by CAS Secretariat and conducted by Dalberg Advisors on behalf of the CGIAR System. Another evaluative study related to the Big Data Platform was commissioned by CAS Secretariat's predecessor, CGIAR's Independent Evaluation Arrangement in 2018, a review of CGIAR's open access/open data policy and implementation support.

In addition to the aforementioned evaluative assessments, since its inception in 2017, the Platform has been the subject of several other reviews and studies, worthy of mention. In response to CGIAR System Management Board's request for a digital strategy that identified CGIAR's comparative advantage relating to big data,¹⁶ a strategic research study was conducted on digital transformation in food, land, and water systems in a climate crisis¹⁷ in support of the 2030 Research and Innovation Strategy. Related to this, a high-level assessment of digital strategy across CGIAR was conducted. Also, in 2021, a review of the Inspire Challenge, assessed the Platform's Inspire Challenge program (2017-2020) and its broader contributions to catalyze partnerships and digital agricultural innovations.

¹⁵ Big Data Coordination Platform: Full Proposal 2017-2020

¹⁶ Chair's Summary, 13th CGIAR System Management Board ('SMB') Meeting. Approved May 3 2019

¹⁷ <https://cgspace.CGIAR.org/handle/10568/113555>

With the launch of a new research modality to advance the One CGIAR 2030 Research and Innovation Strategy, making the digital revolution central to the way of working is one of the seven new implementation approaches prioritized in the strategy (seventh way of working). The key elements of the 2030 strategy's seventh way of working include engagement with partners in developing cutting-edge, context-appropriate digital solutions, improved access to and use of data and digital innovations targeting small-scale farmers, pursuing new digital applications to accelerate learning and knowledge sharing among partners underpinned by principles of findability, accessibility, interoperability, and reusability (FAIR) for all CGIAR data. Thus, leveraging the unprecedented opportunity provided by today's digital revolution is at the front burner of One CGIAR to accelerate progress towards the achievement of the Sustainable Development Goals (SDGs).

Against this backdrop, the recent 2021 Synthesis of Learning from a Decade of CGIAR Research Programs brought to the fore thematic evidence gaps related to digital innovations revealing limitations on the evaluative evidence available on digital innovations. There has been hitherto no comprehensive independent process evaluation of the Platform in its entirety. Informed by the evaluative evidence needs identified in the synthesis, and in response to the request of CGIAR System Council, the Evaluation Function under CAS Secretariat seeks to commission an evaluation of the Platform. The evaluation would assess the Platform's effectiveness, design, and delivery and distil lessons and recommend actionable operational and strategic approaches for the future One CGIAR.

2. The Evaluation

2.1 Evaluation Purpose and Scope

This evaluation will serve the dual purposes of accountability and learning. It will be both summative and formative in nature and will assess the design, scope, implementation status and the capacity to achieve the Platform objectives. It will collate and analyze lessons learned, challenges faced, and best practices obtained during implementation as a guide for future planning. It will assess the performance of the project against planned results and the preliminary indications of potential sustainability of results. The evaluation will provide essential evaluative evidence for decision-making by the CGIAR System Council, Big Data Platform management, and its partners.

The evaluation will cover all the activities of the Platform from its initiation in 2017 through mid-2021 considering the need for timely evidence with the drivers, the transition to One CGIAR, and the COVID-19 pandemic. The evaluation will integrate cross-cutting themes of Gender, Diversity, and Inclusion (GDI), youth, climate change and capacity development as well open data and intellectual assets.

The main objectives of the evaluation of the Big Data in Agriculture Platform are to:

- Assess the relevance of the Platform design, theory of change (ToC) and the Platform's role in positioning CGIAR as a learning organization, its ability to cultivate new digital alliances, pursue data innovation in support of its mission;
- Identify the supporting factors and constraints behind achievement of the Platform and each of its modules and the validity of the ToC assumptions in light of the results achieved, including its response to COVID-19;
- Assess the Platform governance, management, and implementation processes;
- Provide recommendations relevant to the future development and implementation aligned with One CGIAR Way of Working 7 – Making the Digital Revolution Central to Our Way of Working and One CGIAR initiatives related to digital technologies, to include inter alia, "Harnessing Digital Technologies for Timely Decision-Making across Food, Land, and Water System" (Systems Transformation Action Area)¹⁸ and, if applicable, other system-wide recommendations.

The formative and summative component will address both effectiveness of the Platform implementation strategy and the results. This includes the implementation modality, partnership arrangements, institutional strengthening, beneficiary participation, sustainability of the Platform. The evaluation will include review of the project design and assumptions made at the beginning of the project development

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process. It will assess the extent to which the project results have been achieved, partnerships established, capacities built, and cross cutting issues integrated. It will also assess whether the project implementation strategy has been optimum and recommend areas for improvement and learning.

2.2 Key Stakeholders

The key stakeholders of this evaluation with their particular interests are presented in Table 1 (overleaf).

Table 1. The Platform Evaluation key stakeholders

Type of stakeholder	INTEREST	
	Accountability	Learning
CGIAR System Council & Funders	✓	
CGIAR System Board	✓	✓
The One CGIAR Portfolio Performance Management Team	✓	✓
MD, Institutional Strategy and Systems, Global Director, Digital Services.		✓
Initiative Design Teams (IDTs)		✓
Project Coordination, Monitoring and Performance Management Unit		✓
Big Data Platform Management		✓
Big Data Platform Steering Committee, International Advisory board		✓
Big Data Focal Points in all CGIAR Centers		✓
CGIAR partners involved in generating and use of CGIAR knowledge products.	✓	✓
All the Big Data Communities of Practice (CoPs)		✓
End Users of Big Data Platform	✓	✓

To the extent feasible given the resource and time allocated to the evaluation, key stakeholders will be widely consulted and engaged throughout the evaluation process through relevant channels and using the appropriate engagement tools.

2.3 Evaluation Criteria and Questions

The evaluation will examine project implementation against the hereunder criteria by addressing the following (broad but not exhaustive) questions.

Table 2. Evaluation criteria and questions

Criteria	Key Evaluation Questions
Relevance	1. To what extent are the Platform's objectives relevant to the needs of its stakeholders and target groups?
Efficiency	2. Have resources (funds, human resources, time, expertise etc.) been allocated strategically and timely to achieve Platform outcomes?
Effectiveness	3. To what extent did the Platform achieve its intended and unintended outcomes? 4. How effective has the Platform been in building digital capabilities and partnerships supporting CGIAR research? 5. To what extent have Platform outputs and outcomes contributed to changes in the organization and its stakeholders as relates to their use of data and digital technologies?
Sustainability	6. To what extent are the Platform products and communities positioned to be effective in the future, seen from the perspectives of scientists and of the end users of digital agriculture products and innovations?

7. To what extent would the Platform outputs outlive the existence of the Platform in its current form?

The evaluation criteria and key questions are further detailed with sub-questions in Annex 2 and will be elaborated in consultation with relevant stakeholders at the inception phase towards the development of the evaluation matrix.

2.4 Approach and Methodology

The evaluation will be primarily desk-based and use a mixed-methods design. Methodological rigor in the evaluation design will be adhered to. The inception report will include a detailed evaluation matrix and a description of the proposed methodological approach. The inception report and other key deliverables will be peer-reviewed by evaluation and Subject Matter Experts (SMEs). CAS Secretariat's processes will guide, and quality assure the evaluation process.

Quantitative data will be collected via online survey instruments, data will be disaggregated (wherever possible) by age and gender. Quantitative analyses would also be performed to the extent possible on available quantitative indicators and metadata from the relevant data sets (including GARDIAN). Qualitative techniques would combine an extensive review of extant documentation on the Platform, content analysis of the evaluative evidence from the 2021 synthesis exercise, open and semi-structured interviews with internal and external stakeholders and focus-group discussions. It is also recommended that case studies be presented for each Platform Module to understand the user perspectives and experiences. The use of data science techniques such as machine learning algorithms incorporating Artificial Intelligence and data mining where relevant to expand the data collection and analysis of data sets is also encouraged. Data sources will be triangulated to ensure transparency and independence of judgement, and to minimize bias.

Stakeholder groups to be interviewed would be elaborated during the inception phase and include key Platform partners, the Platform's focal points at all Centers, data managers and information specialist at all Centers, and users of the Platform. The evaluation team shall determine whether to seek additional information and opinions from representatives of any the external thought partners to the Platform. To increase credibility, particular value will be placed on the triangulation of the data and solid argumentation of the conclusions drawn and recommendations made. The evaluation would be conducted in close collaboration with the Big Data in Agriculture Platform.

CAS Secretariat will guide the evaluation process and ensure that the evaluation team uses appropriate tools and technology to enhance data access and, that data analysis is robust. CAS Secretariat will also ensure the effective communication of evaluation results with evaluation stakeholders.

2.5 Expected Limitations to the Evaluation

The evaluation's remit and its resources limit the extent to which it can collect primary information from the Platform's vast network of partners. Therefore, the evaluation will use reports and other documents, representative sample of interviews, surveys and limited ground-truthing to gather evidence on the evaluation questions and validate its findings.

3 Evaluation Timeline and Management

3.1 Evaluation Phases and Timing

The evaluation is scheduled to take place between July and December 2021, for transmission to the System Council in December 2021, after vetting with SIMEC. An indicative time frame for the evaluation and expected deliverables is provided in the table 3 in the overleaf (see Annex 3 for a detailed schedule), to be elaborated in the inception report.

Table 3. Indicative Evaluation Timeline, with Milestones and Selected Deliverables, 2021

Phase	July (Weeks)				August (Weeks)				September (Weeks)				October (Weeks)				November (Weeks)				December (Weeks)		
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3
Inception	<input type="checkbox"/> Document Review <input type="checkbox"/> Briefings <input type="checkbox"/> Inception report																						
Inquiry					<input type="checkbox"/> Desk review <input type="checkbox"/> Interviews <input type="checkbox"/> Surveys <input type="checkbox"/> Module case studies <input type="checkbox"/> Data analysis																		
Reporting													<input type="checkbox"/> Preliminary findings <input type="checkbox"/> Report development <input type="checkbox"/> Draft report <input type="checkbox"/> Report QA review <input type="checkbox"/> Validation workshop <input type="checkbox"/> Final report										
Management Response																					<input type="checkbox"/> Management Response		
Dissemination																					<input type="checkbox"/> Targeted webinars <input type="checkbox"/> Knowledge products		

Preparatory phase

During the preparatory phase CAS Secretariat, in consultation with relevant stakeholders, will review key documents and define the scope and issues surrounding the evaluation, and carry out the following tasks:

- Develop the Terms of Reference (ToR);
- Consult the ToR with stakeholder groups (SIMEC, Global Science Group Director- Systems Transformation, evaluands);
- Select and contract the evaluation team leader and in consultation with her/him, the evaluation team.

Inception phase

The inception phase is the responsibility of the team leader. The inception report will focus on the following elements:

- Preliminary project theory model(s); refinement of the evaluation questions, elaboration of evaluation methodology including quantitative and qualitative approaches through an evaluation framework (“evaluation matrix”);
- A stakeholder analysis identifying key stakeholders, networks and channels of communication. This information should be gathered from the Platform documents and discussion with the Platform team;
- A preliminary list of strategic issues of importance for emphasis during the inquiry phase;
- An indicative evaluation report outline and division of roles and responsibilities between the evaluation team leader and the external evaluation team; people to be interviewed and possible surveys to be conducted and a debriefing and reporting timetable.

These elements will be drawn together in an inception report to be agreed between the team and the CAS Secretariat, which will subsequently represent the contractual basis for the team’s work and deliverables of the evaluation. As a requirement to finalize the inception report, a consultation will be arranged between CAS Secretariat, the evaluation team and peer-reviewers to interrogate the evaluation approach and methodology and enhance the evaluation matrix.

Inquiry phase

The evaluation team will collect the evidence according to the plan detailed in the inception report, complete its analysis, and prepare a preliminary list of findings and conclusions.

Reporting phase

In the reporting phase, the evaluation team will prepare a presentation of preliminary findings, to debrief the CAS Secretariat and Platform Management and to seek validation, factual corrections, and feedback.

The team would develop the draft evaluation report for the CAS Secretariat's comments and factual corrections. Under the CAS Secretariat's guidance, the report would be reviewed by a team of external peer-reviewers. With the feedback from relevant stakeholders, the evaluation team would finalize the evaluation report taking into account comments according to the team's judgement.

Management Response

During this phase, CAS Secretariat will liaise with the Project Coordination, Monitoring and Performance Unit through its relevant Tasks Units- Project Coordination Unit (PCU) and, Monitoring and Performance Management Unit (MPMU)¹⁹ to coordinate the preparation of the management response with the Platform management. The management response will be published on the CAS Secretariat website.

Dissemination

The evaluation report, the executive summary and the evaluation brief and other knowledge products along with the management response, will be published on the CAS Secretariat's website. In line with the dissemination and knowledge management strategy to be developed at the inception phase, tailored presentations will be made to targeted stakeholders and learning events organized with internal and external stakeholders.

3.2 Evaluation Management and Responsibilities

The Evaluation Lead, Svetlana Negroustoueva, of the CAS Secretariat manages the evaluation process, under the overall direction of the CAS Secretariat Director, Allison Grove Smith. Questions or comments regarding this Terms of Reference should be directed to CGIAR Advisory Services Evaluation (CGIAR) CAS-Evaluation@CGIAR.org copying s.negroustoueva@CGIAR.org.

The evaluation will be conducted by an independent team of experts (the evaluation team). The team leader has final responsibility for the evaluation report and all findings and recommendations, subject to adherence to CGIAR Evaluation Standards. The primary responsibilities of the team leader will be:

- Setting out the methodology and approach in the inception report;
- Guiding and managing the evaluation team during the inception and evaluation phases;
- Overseeing the preparation of, and quality-assuring, data collection outputs by other members of the team;
- Consolidating team members' inputs to the evaluation products (inception report and the evaluation report);
- Where necessary, representing the evaluation team in meetings with stakeholders;
- Delivering the inception report, draft and final evaluation reports.

The evaluation team is responsible for submitting the deliverables highlighted in 3.3 and detailed in Annex 3 to CAS Secretariat, these include but are not limited to:

- An inception report;
- Three Module case studies;

¹⁹ If these entities do not yet exist, the interaction will be with the existing System Office Programs Unit.

- A brief presentation of preliminary findings, for the debrief with the Platform management and CAS Secretariat;
- Draft report of the Platform evaluation, N.B the CAS Secretariat will provide a template for the draft and final reports;
- A final evaluation report following the report template with a maximum of 25 pages, and written in plain English in line with CAS Secretariat's style guide;
- A two to three-page executive summary, and a set of annexes with additional information apart from the main body of the report;
- PowerPoint presentations covering the main points of the evaluation, including purpose, methods, findings, conclusions, recommendations, and additional notes relevant to the evaluation. The CAS Secretariat will provide the relevant templates.

The CAS Secretariat will be responsible for planning, initially designing, initiating, and managing the evaluation. It will also be responsible for the quality control of the evaluation process and outputs, and dissemination of the results. The Evaluation Function Lead supported by a Senior Evaluation Officer will provide support to the team throughout the evaluation.

The Platform's management, steering committee and focal persons will respond to the Evaluation team's needs for information throughout the evaluation: documentation and data, access to partners and staff for engagement with the evaluators, and information on partners and stakeholders. These actors will be also be responsible for giving factual feedback on the draft evaluation report.

To ensure the independence of the evaluation, the CAS Secretariat's staff will not participate in meetings where their presence could bias the responses of external stakeholders. Adequate consultations with evaluation stakeholders will be ensured by the evaluation team and the CAS Secretariat throughout the process, with debriefings on key findings held at various stages of the evaluation. The Evaluation Function Lead will ensure transparent and open communication with stakeholders during each of the key evaluation phases.

3.3 Evaluation Team

The evaluation team will comprise six (6) team members drawn from the vetted Subject Matter Expert (SME) and Evaluator roster maintained by CAS: (1) Evaluation team leader- Evaluator; (3) Senior SMEs in digital innovation and (1) Mid-level SME in Information, Communications Technology (ICT) and data management. They will be supported by (1) mid-level evaluation analyst (consultant) for data collection, analysis, and Knowledge Management (KM). The team would conduct the evaluation in conformity with international and CGIAR evaluation standards.

The team members will have a strong cumulative experience in conducting complex, global strategic evaluations with suitable background relating to big data in agriculture and working knowledge of CGIAR and its research. The multi-disciplinary evaluation team would combine competencies and expertise in the following areas:

- Data generation, analysis, management and governance;
- Power relationships and politics around information (social science);
- ICT governance, risk management, and international and national regulatory frameworks;
- Partnerships, in particular, with the private sector;
- Research or development agencies on issues, programs and policies related to agriculture and natural resources and digital technologies;
- A strong understanding of Gender, Diversity and Inclusion (GDI) issues;
- High-level expertise in reviewing and processing a large number of documents, conducting one-on-one and group interviews using appropriate technology in data collection and analysis and communication of evaluation results.

Each evaluation team member will be carefully vetted for any present or future conflicts of interest (COI).

The **team leader** will have a minimum of 15 years' experience in evaluation, with extensive experience in regional or global strategic-level evaluations with working knowledge of the use of digital technologies and data science. The team leader must have experience in leading teams, excellent analytical, synthesis

and communication skills (written and verbal) and demonstrated skills in mixed qualitative and quantitative data collection and analysis techniques. The team leader will manage the team of a subject-matter experts and two (2) team members as above with the following qualifications:

- At least a master's degree in Development Economics/Planning, Digital Systems, Computer Science / Engineering, Data Science, Economic, Public Administration, and Management and in any other related university degree;
- Extensive expertise, knowledge, and experience in the field of evaluation of development programs;
- At least 10 years of experience in working with international organizations and donors;
- Experience of program formulation, monitoring and evaluation;
- Experience in designing, developing, implementing, and evaluating technology-assisted projects;
- Skills on high-quality analysis, reporting in English and time management for timely deliverables submission;
- Proven experience coordinating program activities with governmental, nongovernmental, and private-sector partners.

Peer-reviewers with relevant subject -matter expertise will be called up at necessary stages of evaluation design and implementation for enhanced rigor and validity.

3.3 Deliverables and Dissemination of Findings

The inception report: the inception report, which builds on the terms of reference for the evaluation, outlines the evaluation team's proposed approach to the main phase of the evaluation as follows: (i) elaborating the scope and focus of the evaluation; (ii) developing the methodological tools for gathering evidence; (iii) providing a detailed evaluation matrix; (iv) clarifying the analytical frameworks to be used by the evaluation; and (v) providing a detailed work plan for the evaluation.

The evaluation report- the main output of this evaluation - will describe findings and conclusions, based on the evidence collected in the framework of the evaluation questions defined in the inception report, and recommendations logically following the conclusions. The recommendations will be evidence-based, relevant, focused, clearly formulated, and actionable. They will be prioritized and addressed to the different stakeholders responsible for their implementation. The main findings and recommendations will be summarized in an executive summary. The main report should be concise (no longer than 25 pages – excluding the Executive Summary and Annexes) and written in plain English. The evaluation team will be expected to produce a three-page brief of key findings and lessons, following a template provided by the CAS Secretariat.

Review of the draft evaluation report- The evaluation team will submit a zero-draft report to the CAS Secretariat as part of the quality assurance process. Upon the acceptance of a draft of adequate quality, CAS Secretariat will share this first draft report with a team of peer reviewers. The first draft will be shared with the Platform team for their review and comments- for any errors of fact and highlight the significance of any such errors in any conclusions. Subsequently, a discussion version of the report will be presented to SIMEC for feedback. With the feedback of SIMEC integrated, the discussion version of the report will be presented to System Council for their input which will guide the final evaluation report.

The final report shall be submitted by email to the Evaluation Function Lead in electronic editable form (MS Word) aligned with CAS Secretariat's style guide. The final report will follow a standardized structure and template to be provided by CAS Secretariat. CAS Secretariat will finalize the report by having it professionally edited. The final evaluation report will be published on the CAS Secretariat's website.

Presentations: The team leader and evaluation team where necessary will present the evaluation results to key CGIAR stakeholders via various communication channels to targeted audiences.

3.4 Contract and Payment Schedule

The CAS Secretariat is hosted by CGIAR System Organization through an arrangement with the Alliance of Bioversity International and the International Center for Tropical Agriculture, at its offices in Rome, Italy. Contracting will be carried out by our hosting entities and under their name on behalf of CAS Secretariat. The members of the evaluation team are expected to abide by the Conflict of Interest policy of the CAS Secretariat and must maintain independence in fact and appearance from the Platform under review throughout the duration of the assignment. Each evaluation team member must sign and return

statements indicating their understanding and compliance with the policies of the CAS Secretariat and its host institutions. All contracting fees and conditions will be administered in line with the approved policy for consultants. Confidentiality provisions are covered in these contracts. All collected data must be shared for the confidential records kept within the CAS Secretariat; informants should be duly notified to adhere to ethical evaluation principles.

Annex A1: Background: CGIAR Big Data in Agriculture Platform

A1.1 Purpose and Objectives

According to the final July 2016 Proposal, the Platform focuses on enhancing CGIAR and partner capacity to deliver big data management, analytics and ICT-focused solutions to CGIAR target geographies and communities through its ambitious partnerships with both upstream and downstream partners. In addition to developing new partnership models with big data leaders at the global level, the Platform seeks to promote CGIAR-wide collaboration across CRPs and Centers. Big Data Platform's tripartite objectives culled from the July 2016 proposal are:

1. Support and improve data generation, access, and management in CGIAR: For CGIAR to embrace the power of big data analytics and be the leader in generating actionable data-driven insights for stakeholders, key requirements, enabling environment components, and critical gaps, which were identified during the scoping consultations. Through collaboration and co-creation with partners identified as the champions in bringing big data to agriculture, the Platform will provide support to CGIAR and partners to address the gaps, both organizational [i.e., Open Access/ Open Data (OA/OD) compliance] and technical (e.g., providing useful datasets, tools, and services), and organize capacity building activities to sustain the efforts across the consortium.

2. Collaborate and convene around big data and agricultural development: CGIAR needs ambitious external partnerships to deliver the potential of big data to smallholder agriculture. Likewise, CGIAR is an attractive boundary partner for many private and public big data partners to engage in the context of agriculture in the developing world. This objective will set up system-level partnerships that Centers and CRPs can tap into and use to stimulate greater use of data analytics in CGIAR mission-critical research. Amongst other approaches, the Platform will provide opportunities and spaces for facilitated virtual collaboration and interaction among partners and stakeholders. A Big Data Convention will be organized to bring key actors to CGIAR and CGIAR to the key actors in a network that will be documented and nurtured. The Convention will focus on the generation of ideas and innovations. It will democratize big data opportunities, share progress amongst CRPs and Centers in promoting big data analytics. It will build capacity internally and externally on big data approaches in agriculture. Novel approaches to communications will increase exposure of CGIAR work on big data, and further engage a range of actors through novel approaches to partnerships.

3. Lead by example and inspire how big data can deliver development outcomes: Demonstrate the power of CGIAR big data analytics through "Inspire" projects that solve development challenges at the core of CGIAR SRF (Strategy and Results Framework). These may include, but not be exclusive to, approaches that use big data analytics and ICTs to provide unprecedented multi-disciplinary data to researchers, deliver novel information to farmers, monitor the state of agriculture and food security in real time and inform critical national, regional and global policies and decisions. Venture capital (<\$100k) will be provided to generate novel approaches, and some larger projects will be developed to deliver on the overall vision of the Platform: democratize big data to include smallholder farmers.

A1.2 CGIAR Platform for Big Data in Agriculture- Structure and Modules

The Platform operates a networked partnership model that is co-led by CIAT (with CIAT taking fiduciary and operational responsibility) and IFPRI; the Platform facilitates the convergence of CRPs, Centers and external partners towards problem solving. It comprises a nucleus secretariat whose primary objective is facilitating dialogue, collaboration, and communication across and between partners. The Platform Secretariat is driven by a knowledge sharing approach in interacting and networking amongst partners. The Platform operationalizes its tripartite objectives via three modules:

1. **ORGANIZE:** The Organize Module aims to fully open access to CGIAR's intellectual assets, addressing technical and organizational challenges, and provide CGIAR researchers with an enabling environment to strengthen data analytical capacity and develop practical, big data-driven use-cases in a coordinated way. As a minimum, this Module seeks to align CGIAR Centers on open access and

open data, and ensure compliance with CGIAR's Open Access Policy, ratified in late 2013 by all 15 Centers.

The Module works with Center and CRP researchers and Communities of Practice (CoPs) (including the data, knowledge, Information Technology (IT), legal, and other relevant system-wide CoPs) in the inventory and management of datasets towards "open", and supporting tools for researchers' use. The goal is to support all Centers and CRPs to not only comply but overachieve with regard to open access and open data principles and CGIAR policy on these.

2. **CONVENE:** Through the Convene module, the Platform aims to implement an annual CGIAR Big Data and Information and Communications Technology (ICT) Convention where representatives from Centers and CRPs will share information, develop joint initiatives, and collaborate with key external actors in the big data space. It established Communities of Practice (CoPs) across Centers for defining data standards and interoperability protocols, dovetailed with the OA/OD initiatives. It operates virtual collaboration spaces and sponsors quarterly webinars and capacity-building workshops and connects with existing initiatives, other GIAR CoPs, Conventions on ICT4D and Big Data.

The Convene Module assembles big data practitioners from Centers and CRPs together with partners and other Platforms in spaces to encourage interaction with the aim of producing ideas that qualify to be funded for further development under the Inspire Module.

3. **INSPIRE:** The Inspire module seeks to generate high profile, collaborative applications of big data in agriculture through small- and medium- sized "Inspire" initiatives, embedded within larger CRP-related initiatives, that bring to bear new partnerships on core CGIAR challenges. These consist of one to three-year initiatives, a case in point is the INSPIRE Challenge initiative, to generate new analytical approaches, scientific outputs, and high-profile examples of how big data analytics can deliver agricultural development in CGIAR target geographies.

The Inspire Module seeks to create opportunities for novel ideas to be realized through pilot projects with new partners to CGIAR under collaborative efforts embedded within CRP activities.

Figure A1: Big Data PLATFORM Objectives, Minimum Success Factors (MSF) and Modules

Objective 1: Support and improve data generation, access, and management in CGIAR.	<p>MSF: Compliance with the open access and open data policy of CGIAR, ensuring donors and investors in CGIAR can be confident that data is being managed and shared effectively across all CGIAR operations.</p> <ul style="list-style-type: none"> •Module 1-ORGANIZE: organizes extant data and draws them together for unified and interlinked discoverability. It assesses their status and fitness for use identifies what and where gaps exist, and strengthens its analytical capacity for data-driven impact.
Objective 2: Collaborate and convene around big data and agricultural development.	<p>MSF: New partnership models developed with upstream and downstream partners, from public and private sectors, to deepen and widen CGIAR's capacity on big data analytics and use</p> <ul style="list-style-type: none"> •Module 2: CONVENE- Convenes the scientific resources across CGIAR with a X range of partners to generate new collaborative opportunities and bring big data to agriculture, and likewise, agriculture to big data.
Objective 3: Lead by example and inspire how big data can deliver development outcomes.	<p>MSF: Established models for innovation and other approaches will be used to achieve this, built on the foundation of collaboration from Objective II.</p> <ul style="list-style-type: none"> •Module 3: INSPIRE-Inspires work on big data by funding research by CGIAR scientists with partners to innovate new ways to handle big data relevant to agriculture for the benefit of poor smallholder farmers.

Adapted from the Big Data Coordination Platform- Full Proposal (final version) July 2016.

A1.3 Management and Governance

Leadership of the Platform is provided through a secretariat, which consists of a Big Data coordinator, Platform co-founders, a project coordinator, Module One leader, communications specialists, and

administrative support. The Platform coordinator doubles as the leader for both Modules Two and Three respectively. In addition, the Platform also has focal points in all 15 Centers through which it liaises with centers as needed.

As per governance, the Platform relies on its steering committee led by a chair and comprising five other representatives; permanent members both from CIAT and IFPRI respectively. Other members are partners, Centers and Research Programs respectively. Another permanent member is a representative of the CGIAR System Office. The three other steering committee members are on a 2-year rotating basis and representatives of the CRPs, Center and Partner respectively.

A1.4 Platform Principles

- a) Process-oriented agile approach: Establish processes and collaborative spaces needed to deliver goals in phases. Supported by agility, and iterative interactions with users to adapt emerging technologies to fulfill growing needs.
- b) Network approach through partnership: Centered around how networks and communities of practice rather than single institutions leverage technology and new data resources as the basis for solving problems rather than single institutions. These communities of practice can leverage technology and new data resources to create broader and deeper impact in programming.
- c) Iterative data needs assessment and technology landscape analysis: To better understand Open Data initiatives and Big Data based Information and Communications Technology for Development (ICT4D) initiatives, a regular data landscape analysis will be conducted for better alignment of the Platform with newly emerging agricultural research and development topics and big data technologies. This also involves the Platform working with its network partners to assess primary user needs through a multi-partner, multi-datastream, multi-country project in each region.

A1.5 Partnership Ecosystem

Big Data Platform relies on a network of diverse partners comprising All CGIAR Centers and 12 CRPs as well as 70 external thought partners²⁰ such as international organizations, academia, research institutes, private companies including global players on big data analytics. Big Data’s partnership ecosystem spans upstream knowledge generators, through downstream knowledge users.

A1.6 Funding and Budget

According to the Platform’s Proposal, Big Data Platform had a six-year budget of US\$30.2m primarily from Windows 1 & 2, representing an annual budget which ranges from US\$3.9m to US\$6.7m. In terms of the budget allocation per module, Module One received the largest budget share in 2017 (68% total) and 2018(58%) with the main cost driver being funding to Centers aimed improving the effective management of CGIAR data and compliance with the Open Access, Open Data (M) Policy. Module Two’s budget in 2017 was US\$1.46 with a progressive growth by a standard 5% annually to maintain the fixed costs associated with creating an enabling environment. Similarly, Module Three’s budget was projected to double by its fourth year from year one (US\$0.6m) to year four (US\$1.31m). Budgeted cost for the Platform Secretariat was pegged at US\$300k in the proposal and was covered under Module Two Convene- with percentage allocations to cross-cutting themes such as capacity building (40%), gender and youth-related activities (17%).

Table A1. CGIAR Big Data in Agriculture Platform- Funding and Budget (USD)

Module	2017	2018	2019	2020	2021	2022	Total
Module 1 – Organize	4,336,320.51	3,172, 574.31	2,261,673.74	1,159, 962.09	1,125, 489.82	1,192,411.46	13,248,431.93
Module 2 – Convene	1,455,300	1,516,077	1,579, 603.14	1,646, 517.85	1,716,339.85	1,789,267.18	9,703,105.02
Module 3 – Inspire	612, 720	670, 095.9	1,017, 294.24	1,307, 446.44	1,089,338.37	538,356.48	5,235,251.43

²⁰ Source: <https://bigdata.cgiar.org/about-the-platform/>

Management + Support Cost	300,000	315,000	330,750	347,288	364,652	382,885	2,040,575
Total	6,704,340.51	5,673,747.21	5,189,321.12	4,461,214.38	4,295,820.04	3,902,920.12	30,227,363.38

Source: Big Data in Agriculture resubmitted Proposal

Annex A2: Evaluation Criteria, Key questions and Sub-questions

Table A2.1: Evaluation Criteria, Key questions and Sub-questions

Criteria	Key Evaluation Questions	Sub-Questions
Relevance and Strategic Fit	1. To what extent are the Platform's objectives relevant to the needs of its stakeholders and target groups?	<ul style="list-style-type: none"> a) Were the Platform mechanisms and approaches aligned with Center and key partners' priorities, capacities, and expectations? b) To what extent have cross-cutting themes GDI, youth, climate change, Open Data and Intellectual Asset issues been considered in project design and implementation? c) How appropriate are the Platform's outputs in the light of its operating environment and to what extent are these properly used, resilient and adaptable to local and evolving constraints including COVID-19 Pandemic?
Efficiency	2. Have resources (funds, human resources, time, expertise etc.) been allocated strategically and timely to achieve Platform outcomes?	<ul style="list-style-type: none"> 2 How adequate has been the high-level, technical, institutional, and administrative support from the Platform's partners? 3 How efficient was the implementation: use of resources, timeliness?
Effectiveness	3. To what extent did the Platform achieve its intended and unintended outcomes?	<ul style="list-style-type: none"> a) To what extent has the Platform enabled Centers to comply with CGIAR's Open Access and Data Management (OADM) Policy? b) How has the Platform contributed to change in organizational data policy and its implementation? (<i>potential data sources: OA/OD Policy in effect, Information and Data Managers' CoP, CGIAR Core metadata schema, System organization stakeholders</i>). c) To what extent did the Platform achieve the planned outputs and outcomes noted in the proposal? (<i>Source: Big data reports and associated evidence</i>). d) What have been the main contributing or limiting factors for the results achieved? e) How has the Monitoring, Evaluation and Learning (MEL) system facilitated or inhibited achievement? f) To what extent has the Platform's governance and institutional mechanisms helped to create ownership among key stakeholders?
	4. How effective has the Platform been in building digital capabilities and partnerships supporting CGIAR research?	<ul style="list-style-type: none"> g) Partnerships <ul style="list-style-type: none"> i. To what extent has the Platform accelerated Centers' progress towards making their data Findable, Accessible, Interoperable and Reusable (FAIR)? ii. To what extent has the Platform enabled CGIAR to engage with the wider Big Data community? (<i>data sources: Community of Practice participation, reported partnerships, Convention participation, Inspire Challenge evaluation</i>). iii. Technical communities of practice: how has the Platform enabled (or not) the expansion of external engagement in technical communities of practice? (<i>data sources, CoPs and communications team</i>).

		<ul style="list-style-type: none"> iv. How has the Platform enabled external partners to have their data searchable alongside CGIAR data via GARDIAN? (<i>data source: https://gardian.bigdata.cgiar.org/</i>). v. Incentives to publish process data: To what extent has the Platform promoted incentives to publish scientific meta data among its partners? vi. Partnership ecosystem & capabilities: What capabilities and constraints do the internal and external partnership typologies in different regions contribute to the Platform's outputs and outcomes? vii. To what extent has the Platform strengthened capacities to promote demand for and use of FAIR data? viii. To what extent did the Platform conventions open the way to build/deepen novel partnerships that leverage CGIAR expertise to shape the future of digital agriculture?
		<ul style="list-style-type: none"> h) Identification of digital research and innovation challenges <ul style="list-style-type: none"> i. To what extent has the Platform's technical communities of practice (CoPs) engaged with partners to stay abreast of digital innovations related to CGIAR research domains, and sought to develop new digital research capabilities in CGIAR? (<i>data source: CoP sessions at Conventions, annual work plans and reports by CoP</i>). ii. How effective has the Platform been in identifying challenge areas for targeting digital innovation linked to the CGIAR research portfolio? (<i>data source: Inspire Challenge evaluation</i>).
		<ul style="list-style-type: none"> i) New/Improved Methods. To what extent has the Platform catalyzed the development of new digital methods for research or delivery of research? (<i>Potential data sources: CGIAR publications focused on digital innovations before and after 2017, in grey literature and peer-reviewed publications; evaluation of the Inspire Challenge</i>).
		<ul style="list-style-type: none"> j) Data collection and analysis questions and potential sources <ul style="list-style-type: none"> i. What Platform generated outputs would improve CGIAR data collection and analysis (<i>Data sources: GARDIAN, AgroFIMS, CG Labs, Community of Practice products</i>) and who is using or co-developing them? ii. What outputs from the Platform target enabling CGIAR to manage potential legal or reputational risk regarding data privacy and security? (<i>data sources: responsible data guidelines, 'managing agricultural privacy' report for system engineers, GARDIAN PII (personally identifiable information) detector</i>). iii. To which extent are the Platform's quality control mechanisms improving (or not) the shared data quality?
		<ul style="list-style-type: none"> k) New knowledge and innovations: To what extent has the Platform contributed to digital innovations for research and delivery of research in the CGIAR? (<i>Potential data sources: "digital" outputs by CRPs before and after 2017, Inspire Challenge evaluation, CoP outputs and reports</i>).
	<p>5. To what extent have Platform outputs and outcomes contributed to changes in the organization and its stakeholders as relates to their use of data and digital technologies?</p>	<ul style="list-style-type: none"> a) To what extent have Platform investments resulted in digitally-enabled research innovation in CGIAR? (<i>Potential data sources: uptake of Platform tools by internal and external stakeholders: GARDIAN, Expert Finder, AggroFims by Alliance Bioversity-CIAT, IITA/Excellence in Agronomy, FAO; uptake and use of CoP outputs and reports by CGIAR and CoP members</i>). b) To what extent have Platform investments equipped CGIAR with new cross-cutting capabilities to use its data to address commonly posed research questions regarding agriculture, climate, and food systems? (<i>data sources: analytic products on</i>

		<p><i>climate risk and fertilization generated using Big Data analytic environment).</i></p> <p>c) To what extent do Platform investments make more data available for agricultural analytics, and facilitate the use of these data? (<i>data sources: growth of data and publications discoverable over time via GARDIAN, growth in GARDIAN partners over time).</i></p> <p>d) To what extent has the Platform helped change CGIAR culture and practice regarding responsible, ethical data collection, management, and analysis? (<i>Potential data sources: interviews with data managers, performance management team at System Office, datasets and publications discoverable over time via GARDIAN, user traffic of GARDIAN, System Management Board minutes from 13th meeting).</i></p>
Sustainability	d) To what extent are the Platform products and communities positioned to be effective in the future, seen from the perspectives of scientists and of the end users of digital agriculture products and innovations?	<p>e) To what extent do the internal and external stakeholders engage with the Platform (e.g. the Convention, CoPs, innovation grant process, data processes and tools) value it? (<i>Data sources: evidence from the Inspire Challenge interviews. Thematic analysis of semi-structured interviews from the digital strategy research).</i></p> <p>f) What Platform-generated insights, products, and communities have contributed to the One CGIAR reform/reorganization?</p> <p>g) What Platform-generated artefacts, policies, products, communities and approaches are being integrated into One CGIAR?</p> <p>h) What are the lessons learned for future design of similar initiatives?</p> <p>i) To what extent does the Platform position CGIAR with a leadership voice in digital agriculture in the eyes of its international partners?</p>
	j) To what extent would the Platform outputs outlive the existence of the Platform in its current form?	<p>a) To what extent do the internal and external stakeholders own and seek continuity of its programmatic elements? If so, which and why? If not, why not? (<i>Data sources: evidence from the Inspire Challenge interviews. Thematic analysis from semi-structured interviews from the digital strategy research).</i></p> <p>b) What are the lessons learned to facilitate the translation of Platform's outputs and outcomes to CGIAR's way of working 7-Making the Digital Revolution Central?</p> <p>c) How would capacities built in partners ensure sustainability of results?</p> <p>d) What are the key factors in management and governance structured to ensure success and sustainability of the Platform?</p>

Annex A3: Indicative Evaluation Schedule

Table A3: Indicative Evaluation Schedule

Evaluation Phase	Tasks	Outputs	Responsible	Dates
Preparatory	Draft evaluation ToR /ToR Revisions	Final evaluation ToR		
	Selection of consultants from the vetted roster	Evaluation team contracts.	CAS Secretariat	9 July
Inception	Onboarding and briefing of the external evaluation team	Draft inception report with evaluation matrix	Evaluation team	

Evaluation Phase	Tasks	Outputs	Responsible	Dates	
	Development of the Inception report with the evaluation matrix			23 July	
	Consultation with peer reviewers on the methodology and approach.	Final inception report and evaluation matrix	Evaluation	30 July	
Inquiry	Desk review				
	Survey	Survey instrument	Evaluation Team	1-8 October	
	Interviews	Interview notes			
	Module case studies	Case study notes			
Analysis and report development	Detailed report outline for feedback to CAS				
Reporting	Validation workshop	PPT	Evaluation Team and CAS Secretariat	11-15 October	
	Submission of draft Platform evaluation report	Draft Platform evaluation report		25 October	
	Report review by CAS, peer-reviewers and key stakeholders as needed.	Compiled feedback by peer-reviewers and key stakeholder groups.	Evaluation Team	5 November	
	Drafting of the final report integrating the feedback	Draft final report		5 November – December 6	
	Presentation of Draft final Report to SIMEC for feedback	Draft final report, PPT	CAS Secretariat		
	Revision of the draft final report integrating SIMEC's feedback	Revised draft final Report	Evaluation Team		
	Presentation of draft final Report to System Council	Draft final report. PPT	CAS Secretariat/Evaluation Team		
		Final report	Evaluation Team	10 December	
	Management Response	Management Response coordinated by Project Coordination, Monitoring and Performance Unit.	Management response	CAS Secretariat liaising with Project Coordination, Monitoring and Performance Unit.	December 2021

Evaluation Phase	Tasks	Outputs	Responsible	Dates
Dissemination	Development of knowledge products and knowledge management in line with the Dissemination strategy for the Evaluation.	Evaluation briefs and knowledge products.	CAS Secretariat/Evaluation team where necessary.	December Onwards



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