

**International Center for Tropical Agriculture***Since 1967 Science to cultivate change*

Terms of Reference for Data Management Roles – A compilation

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# Introduction

The ToRs in this document are taken from those used for various CGIAR organisations and CRPs in recent years. Although many of these are not directly relevant at the project level, we have included them here for reference and to give the reader an insight into some of the higher level data management tasks needed in organisations.

We have also included some general ToRs for a Data Manager and a Data Technician. These terms of reference are provided to help PIs and researchers with the task of determining the responsibilities of a data manager and other data management staff and as guidance for what should be expected from a data manager. These ToRs will need modifying and contextualising to make them appropriate for specific research projects. It is important to budget for these roles; see the separate document on Budgeting and Planning for Data Management for further details.

# Data Manager

The role of the data manager is to provide expertise to guide, support and oversee data management within the project.

He/she should have experience in handling data of different types including:

* Survey, experimental and monitoring data;
* Video and audio files;
* Images and photos;
* Digital maps.

## Role and Responsibilities

* Develop, maintain and enhance project databases, wherever located, while maintaining data quality standards in accordance with the project data management strategy.
* Interact with researchers within the project and beyond, and support them on issues related to data access and management, including the production of data that can be archived and published via project databases.
* Collaborate with project staff to organise and publish databases using basic web interfaces and languages, including web-based visualisation of spatial data and maps.
* Keep abreast of developments in information technology and assist in advising the project team on latest information technology solutions.
* Contribute to the development and implementation of the project data management strategy.

## The data manager should have:

* A professional degree in related fields (IT desirable);
* Comprehensive knowledge and up-to-date understanding of computing systems, databases and programming;
* Good knowledge of data management science, spatial analysis and metadata standards.

## He/she should:

* Value the sharing of information and continuous improvement in a cooperative atmosphere of constructive evaluation and learning;
* Be a team player with excellent interpersonal and communication skills, with the ability to effectively interact with people at all levels in a multi-cultural and multi-disciplinary environment;
* Have the ability to write and produce clear documentation;
* Be a completer-finisher and have the ability to notice details while keeping in mind the big picture.

# Data Technician

The main role of the Data Technician is to provide technical support to the Data Manager.

## Role and Responsibilities

The data technician would be expected to assist the data manager in a variety of roles. These could include:

* Developing data entry systems for data collection using:
  + Hand-held devices (e.g. ODK)
  + Paper questionnaires (e.g. CSPro)
* Running quality assurance checks on data;
* Extracting data for analysis;
* Writing data management guidelines;
* Helping to train project members on data management issues;
* Assisting teams with the creation and management of a data and document store (DDS);
* Assisting the data manager in implementing the project Data Management Strategy and other initiatives related to data.

## The data technician should have:

* A professional degree in related fields (IT desirable);
* Comprehensive knowledge and up-to-date understanding of computer systems, databases and programming;
* Good knowledge and experience of data management science and metadata standards.

## He/she should:

* Value the sharing of information and continuous improvement in a cooperative atmosphere of constructive evaluation and learning;
* Be a team player with good interpersonal and communication skills;
* Have excellent organisational skills and be able to demonstrate attention to detail;
* Be willing to carry out repetitive tasks and see a job through to the end;
* Be able to write and produce clear documents and guidelines for researchers;
* Have some experience in data archiving.

# Example ToRs

## ICRISAT: Data Management Unit

The terms of reference for the Data Management Unit are:

1. Development of a comprehensive, practical and user-friendly suite of workflows and protocols that facilitate research data storage and access at ICRISAT.
2. Design and development of methods to assure the scientific staff and management of the non-violability, critical integrity and security of data preserved.
3. Establishment of a framework for promoting data management within all research areas of ICRISAT (e.g. by promoting discipline-based working groups to develop discipline-specific data curation methods based on internationally accepted standards).
4. Awareness creation among all ICRISAT scientists and support staff on the importance of data management.
5. Organisation of training programmes for ICRISAT scientists and research support staff on data conservation and preservation methods and techniques, including self-instructional online modules.
6. Monitoring the usage of curated ICRISAT data sets by partners and others to determine their impact and to prioritise future efforts in data management.
7. Liaising with the CGIAR Consortium, CGIAR Research Programmes and other global initiatives and discussions on research data management.

## ILRI: Research Technician – Data collection and Management

#### Key Responsibilities

* Assisting in the development of data collection tools;
* Training enumerators in the use of data collection tools and supervise their use in the field;
* Responsible for specific field activities in the data processing and quality assurance process (linking field data with the overall data management system);
* Producing simple summaries and analysis to support and guide field staff;
* Acting as a feedback person for field staff in the event of errors in the data collection process;
* Maintaining the hardware used for data collection (e.g. tablets, phones and netbooks) and associated security of electronic files;
* Other activities relating to the good conduct of field research.

#### Basic Requirements

* A BA/BSc in Computer Science, Information Systems, Mathematics and Statistics or other relevant discipline;
* Knowledge and experience in agricultural and rural development issues;
* Experience in data collection and management and the application of quality assurance (QA) standards and procedures;
* Experience with both qualitative and quantitative data collection;
* Experience in the use of data collection software (CSPro, ODK) and at least one statistical package (e.g. R, SPSS, STATA);
* Excellent interpersonal skills and an ability to work flexibly in multi-disciplinary teams;
* Good organisational skills.

#### Recruitment notes

* Years of experience may be indicated for each requirement depending on the complexity of the job.
* This is a full-time position.

## ILRI: Research Technician – Data Systems

#### Key Responsibilities

* Contributing to the development of data management systems, databases and tools;
* Writing procedures and software tools to store, extract and prepare data for analysis;
* Programming field survey instruments and assisting in the training of field teams on their use;
* Implementing and monitoring data management quality assurance protocols and routines, including data auditing and database backups;
* Ensure data interoperability;
* Contributing to the overall data management process.

#### Basic Requirements

* A BA/BSc in Computer Science, Information Systems, Mathematics and Statistics or other relevant discipline;
* Knowledge and experience in agricultural and rural development issues;
* Experience in database management and in applying quality assurance (QA) standards and procedures;
* Experience with both qualitative and quantitative data management and analysis;
* Experience in the development of data collection instruments using CSPro or ODK, and experience in at least one statistical package (R, SPSS, STATA);
* Experience with SQL;
* Software programming expertise (e.g. C++, Java, Python) in the development of data driven applications and data interoperability;
* Knowledge and experience in the development of relational databases;
* Excellent interpersonal skills and an ability to work flexibly in multi-disciplinary teams;
* Good organisational skills.

#### Recruitment notes

* Years of experience may be indicated for each requirement depending on the complexity of the job.
* This is a full-time position.

## IFPRI: Head, Research Data Management Services

The International Food Policy Research Institute (IFPRI) is seeking a highly motivated individual for a newly created position as Head of Research Data Management Services. The successful candidate will lead the development of an institutional Research Data Management Services Unit (RDMS) to support advanced data acquisition, data storage, data management, data integration, and other computing and information-processing services. Housed within the Communications and Knowledge Management Division (CKM), the RDMS unit will provide guidance and support to the two CGIAR research programmes led by IFPRI: Policies, Institutions and Markets; Agriculture for Nutrition and Health; as well as the Institute’s research divisions/programmes/offices. The position is a one-year, fixed-term, exempt, renewable appointment based at IFPRI HQ in Washington DC.

#### Essential Duties

* Create the framework and identify the tools necessary for an institutional Research Data Management Services Unit that supports research productivity and competitiveness and helps researchers prepare data management plans for all proposals that produce research.
* Develop an institutional Research Data Management and Sharing Policy that is compliant with CGIAR and international policies and standards.
* Help develop project and programme data management plans, in collaboration with the CGIAR research programmes, IFPRI research divisions/programmes/offices, Computer Services Unit, and the Knowledge Management Unit (KM) with CKM.
* Use information management best practices to harmonise data collection processes and sources, database support, and storage engineering.
* Ensure the timely transfer of datasets from researchers to the KM Unit for the public use of datasets, and collaboration with other data consortia.
* Develop and delivery research data management training to IFPRI staff to increase awareness of research data management requirements, best practices, benefits and RDMS support.
* Hire, manage and supervise future RDMS staff.

#### Required Qualifications

* Master’s degree in Statistics, Computer Science, Information Science or Social Science.
* Minimum of ten years’ proven experience in database administration and data analysis, with a minimum of three years’ experience in data collection.
* In-depth knowledge of and experience with data management and statistical analysis software, including Software-as-a-Service (SaaS) platforms.
* Knowledge of advanced cyber infrastructure software technologies.
* Strong computer programming experience with an emphasis on designing complex, distributed database systems based on web-based architecture.
* Experience with assessment design and data management, with significant experience at the household level, with knowledge of different data collection methodologies.
* Experience in designing, conducting and analysing large surveys in developing country contexts.
* Experience in the management of large projects and multi-institutional collaborations.
* Experience in managing, training and supporting staff.
* Proven ability to undertake activities through a participatory, inclusive and consultative process; demonstrated ability to interact professional with a diverse employee population and with all levels of staff and management.
* Fluency in written and spoken English; excellent English languages writing skills.

#### Preferred Qualifications

* A PhD in Statistics, Computer Science, Information Science, or Social Science.
* Proficiency in another language is desirable; command of French or Spanish would be an asset.
* Knowledge of geographical information systems and experience management geospatial datasets.

## GCP: Data Manager/Training Specialist

The Generation Challenge Programme (GCP) is seeking a Data Manager/Training Specialise who will manage the crop registry of GCP, provide support and training to project investigators and users of the Integrated Breeding Platform (IBP). He/she will be responsible for maintaining, updating and curating the crop registry and providing support to the users in accessing it. He/she will work with the IBP Informatics Coordinator in handling training, writing training materials and providing technical support to the users of the IBP informatics tools.

The Data Manager will report to the Informatics Coordinator of the IBP and will interact with project investigators and users of the Informatics Breeding Platform to ensure that the data generated by the platform are well managed and technical support to the use cases are timely and properly done. This international position, based at GCP headquarters in Mexico, is for a fixed-term contract of three years with the possibility of renewal subject to performance and funding.

#### We are seeking candidates with the following qualifications:

* At least a Masters’ Degree in Biometrics or Informatics;
* At least five years of appropriate experience;
* Experience with the management and curation of biological data;
* Experience with consulting, training and supporting users of informatics applications;
* Experience with quality assurance for research data;
* Affinity for international agricultural research and development;
* Ability to work well as part of a multi-disciplinary and decentralised team;
* Excellent communication skills in written and spoken English.

#### Experience in the following areas would also be considered a major asset:

* Managing information for crop breeding programmes;
* Analysis of data from genetics and molecular biology.

## CCAFS: Data Manager

We are seeking applications for a qualified Data Manager. His/her role is to provide expertise to guide, support and oversee data management within CCAFS and between CCAFS and its associated partners around the world. CCAFS themes are generating large amounts of data of many different types, including video testimonials, interactive mapping applications, household survey data, climate data, and toolkits of adaptation and mitigation options. These data are located on several different platforms including: the CCAFS Climate Portal ([www.ccafs-climate.org](http://www.ccafs-climate.org)), the CCAFS website ([www.ccafs.cgiar.org](http://www.ccafs.cgiar.org)), the CCAFS Dataverse ([dataverse.harvard.edu/dataverse/CCAFSbaseline](https://dataverse.harvard.edu/dataverse/CCAFSbaseline)), and AgTrials (<http://agtrials.org>). CCAFS also has increasingly important links to other databases implemented by other initiatives such as HarvestChoice (<http://harvestchoice.org>).

The data manager will be required to implement the CCAFS Data Management Strategy, coordinate all CCAFS data activities into a cohesive whole, and oversee the development of a CCAFS Data Portal.

#### Role and Responsibilities:

* Develop, maintain and enhance CCAFS databases, wherever located, while maintaining data quality standards in accordance with the CCAFS Data Management Strategy.
* Write and maintain a meta database for CCAFS data.
* Interact with scientists within the CGIAR and beyond, and support them on issues related to data access and management, including the production of data that can be archived and published via CCAFS databases.
* Collaborate with CCAFS staff to organise and publish databases using basic web interfaces and languages including web-based visualisation of spatial data and maps.
* Provide specifications for appropriate (hardware/software) products as requested by CRP7 scientists.
* Keep abreast of developments in information technology and assist in advising CRP7 management in latest information technology solutions.
* Contribute to the development and implementation of the CCAFS Data Management Strategy.

#### The candidate shall have the following competencies, skills and experience:

* A professional degree in related fields (IT desirable).
* Comprehensive knowledge and up-to-date understanding of computing systems, databases, programming, Java Script and .NET.
* Good knowledge of data management science, spatial analysis and metadata standards.
* Experience with ArcGIS Desktop and ArcGIS Server, and the ability to understand and learn from other people’s code.
* Value the sharing of information and continuous improvement in a cooperative atmosphere of constructive evaluation and learning.
* A team player with excellent interpersonal and communication skills, with the ability to effectively interact with people at all levels in a multi-cultural and multi-disciplinary environment.
* Ability to write and produce documents in both Spanish and English.
* Knowledge of web development.

## CCAFS: Data Technician

We are seeing applications for a Data Technician. His/her role is to provide technical support to the Data Manager who will be his/her line manager. CCAFS themes are generating large amounts of data of many different types, including video testimonials, interactive mapping applications, household survey data, climate data, and toolkits of adaptation and mitigation options. These data are located on several different platforms including: the CCAFS Climate Portal ([www.ccafs-climate.org](http://www.ccafs-climate.org)), the CCAFS website ([www.ccafs.cgiar.org](http://www.ccafs.cgiar.org)), the CCAFS Dataverse ([dataverse.harvard.edu/dataverse/CCAFSbaseline](https://dataverse.harvard.edu/dataverse/CCAFSbaseline)), and AgTrials (<http://agtrials.org>). CCAFS also has increasingly important links to other databases implemented by other initiatives such as HarvestChoice (<http://harvestchoice.org>).

The Data Technician will assist the Data Manager in implementing the CCAFS Data Management Strategy, coordinating all CCAFS data activities into a cohesive whole, and overseeing the development of a CCAFS Data Portal.

#### Role and Responsibilities:

The Data Technician would be expected to assist the Data Manager in a variety of roles. These could include:

* Developing data entry systems;
* Running quality assurance checks on data;
* Extracting data for analysis;
* Writing data management guidelines;
* Helping to train project members on data management issues;
* Assisting teams with the creation and management of a DDS (Data and Document Storage facility);
* Assist the Data Manager in implementing the CCAFS Data Management Strategy and other CCAFS initiatives related to data.

#### The candidate shall have the following competencies, skills and experience:

* A professional degree in related fields (IT desirable).
* Comprehensive knowledge and up-to-date understanding of computing systems, databases and programming.
* Good knowledge and experience of data management science and metadata standards.
* Value the sharing of information and continuous improvement in a cooperative atmosphere of constructive evaluation and learning.
* A team player with good interpersonal and communication skills.
* Ability to demonstrate a strong attention to detail and excellent organisational skills.
* Willingness to carry out repetitive tasks and see a job through to the end.
* Ability to write and produce documents in both Spanish and English.
* Experience of data archiving would be an advantage.

## CIMMYT: South Asia Data Coordinator

The International Maize and Wheat Improvement Centre (CIMMYT) seeks an innovative, self-motivated and service-oriented professional with excellent organisation and people skills to coordinate data flow and curation as part of a dynamic research team focused on increasing food security and reducing poverty in South Asia. CIMMYT is a not-for-profit research and training organisation with partners in over 100 countries. Please refer to our website as [www.cimmyt.org](http://www.cimmyt.org) for more information.

The successful candidate will initially focus his/her activities within the Cereal Systems Initiative for South Asia (CSISA). This project, now beginning its second phase, was established in 2009 with funding from the Bill and Melinda Gates Foundation and the United States Agency for International Development to support regional and national efforts for improving cereal production growth in South Asia’s most important grain baskets. CSISA Research Programmes (CRPs), and a wide range of public, private and civil society sector programmes in the region.

#### Responsibilities include but are not limited to:

* Help establish data management priorities and work with the project team to refine an implementation plan that includes common standards, documentation, curation processes, and timelines for data entry into repositories;
* Coordinate the collection, organisation, and short and long-term storage of agronomic, socio-economic, and geospatial data, working with GIS specialists, programmers, database managers, project staff and development partners;
* Work with CIMMYT data managers, programmers and project data teams to design, develop or customise institutional, open source or commercial platforms, online data collection tools, and interfaces as needed for more efficient data collection, storage and distribution, including mobile survey clients and back-end databases;
* Coordinate usability studies and user testing prior to implementation of data collection tools and databases;
* Assist in the installation and implementation of databases, repositories and tools to facilitate data management through the data lifecycle; develop and conduct training and plan for continued support to facilitate their use;
* Assist with the development of terms and conditions governing data sharing agreements, so that individual and institutional intellectual property rights are assured;
* Travel to project offices to train staff and implementing partners on the dimensions of the data management plan, effective use of tools and to ensure SOPs are consistently followed;
* Ensure that datasets are regularly uploaded to appropriate repositories for wider viewing and sharing with appropriate and robust metadata;
* Advise on tools for data analysis, visualisation, and mapping based on needs and user scenarios.

#### Requirements:

The successful candidate will have at least 4 years of experience dealing with data and/or database management, preferably in the biophysical or social sciences and at least some experience working with international organisations. Specific requirements include:

* Experience with relational databases, MySQL and digital repositories;
* Familiarity with tools such as Google Fusion Tables, ODK, etc., and other robust open source and commercial solutions to aid in the collection and management of various data types;
* Knowledge of mobile data collection platforms, including both Android/Java-based and Netbook-based systems, and the ability to implement applications on them;
* Familiarity with the management and archiving of spatial data
* Familiarity and prior experience in web development, content management systems, collaboration tools, and server administration;
* Strong problem-solving skills, high level of motivation, ability to handle multiple tasks and to deliver products on time;
* Strong interpersonal skills, the ability to maintain good working relationships with staff and partners from diverse cultures, subject domains and institutions, and with different levels of competency;
* Effective communication capabilities across all levels of management, staff, and clients/users;
* Fluency in English;
* Experience with statistical packages (e.g. R) and programming languages (e.g. Python, Java, JavaScript, VB or C++) would be advantageous.

## ICRAF: Data Manager

#### Data Management Support

* Supervise the unit’s data management assistants, regional data management focal points, data consultants and data management interns.
* Design and supervise the creation of flexible and integrated data management systems for multi-disciplinary projects.
* Work closely with the Head of the unit and ICRAF scientists to develop tools to support standardised protocols for data management (collection, curation, archiving).
* Support ICRAF projects in implementing the research data management (RDM) policy, ensuring adequate metadata provision. ‘Data’ includes both field data and associated documents (e.g. project proposals, reports, statistical analyses, etc.)
* Keep up-to-date with the latest tools and resources, including open-source software, for the collection, management, storage, sharing and processing of research data.

#### Manage ICRAF research data repository, research data systems and implement research open access initiatives

* Supervise regular auditing of selected ICRAF projects to ensure research data management standards of preservation (archiving), exposure (sharing) and understandability (metadata).
* Liaise with ILRI-ICRAF ICT group to ensure suitable and sufficient storage, associated software provision for research data and accessibility to both internal and external users.

#### Capacity building to ICRAF and Partners

* Provide training and capacity building to ICRAF researchers and partners on Research Data Management.
* Provide guidance and mentoring to ICRAF researchers on the design and implementation of research databases, mobile data collection and digital data entry systems.

## CGIAR Consortium: Data and Knowledge Manager

#### Job Description

The Data and Knowledge Manager (DKM) will coordinate all internal and external day-to-day data and knowledge management efforts on behalf of the Consortium Office, including providing project leadership for several key initiatives. The DKM will work with the Director of the Knowledge Management, Communication and ICT (KMCI) Unit, the KMCI team in the CGIAR Consortium Office, as well as data, information and knowledge managers at the 15 Research Centres and 16 CGIAR Research Programmes. The DKM will be responsible for helping implement CGIAR’s Data & Knowledge Management Strategy, improving and developing its data, information and knowledge systems, and overseeing and contributing to new knowledge management and exchange initiatives and platforms. Central to the DKM’s role will be the implementation of two key initiatives: CGIAR’s Open Access and Data Management Roadmap, and the development of a CGIAR Consortium-wide collaboration platform.

#### Key Responsibilities

* Provide project management and coordination for the implementation of the CGIAR Consortium’s Open Access and Open Data initiative.
* Provide leadership and project management for Data and Knowledge Management initiatives, including the New Alliance Technology Platform, with partners and stakeholders.
* Oversee development and implementation of data and information standards to make data, information and knowledge more widely available for Consortium Members and Partners.
* Provide leadership and strategic guidance to identify and implement improved mechanisms for internal communication, collaboration, sharing and learning.
* Oversee maintenance, curation and improvements to CGIAR’s data, information and knowledge repositories.
* Contribute to the development of new technology-based data, information and knowledge sharing platforms.
* Participate in/collaborate with external groups, organisations and events to improve knowledge sharing.
* Facilitate the CGIAR Information and Knowledge Managers Communities of Practice.

#### Skills and Qualifications

* University Degree in Communications, Knowledge Management, Information Management, Library Science, Business or related discipline, or suitable equivalent.
* 10 years’ relevant experience working in the design and deliver of knowledge management programmes and services, including several years’ experience developing and executing strategic KM initiatives acquired from either an international NGO or research organisation with strong knowledge of internal and external collaboration and sharing methods.
* Strong and demonstrated background in developing and implementing data standards, including knowledge and understanding of open access and open data initiatives.
* Strong and demonstrated ability to manage multiple projects simultaneously, proactively identify new projects, meet deadlines, and work under minimal supervision.
* Experience in managing effective internal information management systems.
* Current knowledge of international research and development.
* Broad understanding of best practices in library management, document management, and information management.
* Demonstrated experience leading and managing teams across geographies in cross-functional, matrixed work environments.
* Excellent writing, editing and oral communication skills.
* Ability to develop and manage relationships with a range of different stakeholder groups including science development, and technology development institutions.
* Experience working with communications and capacity building efforts is highly desirable.