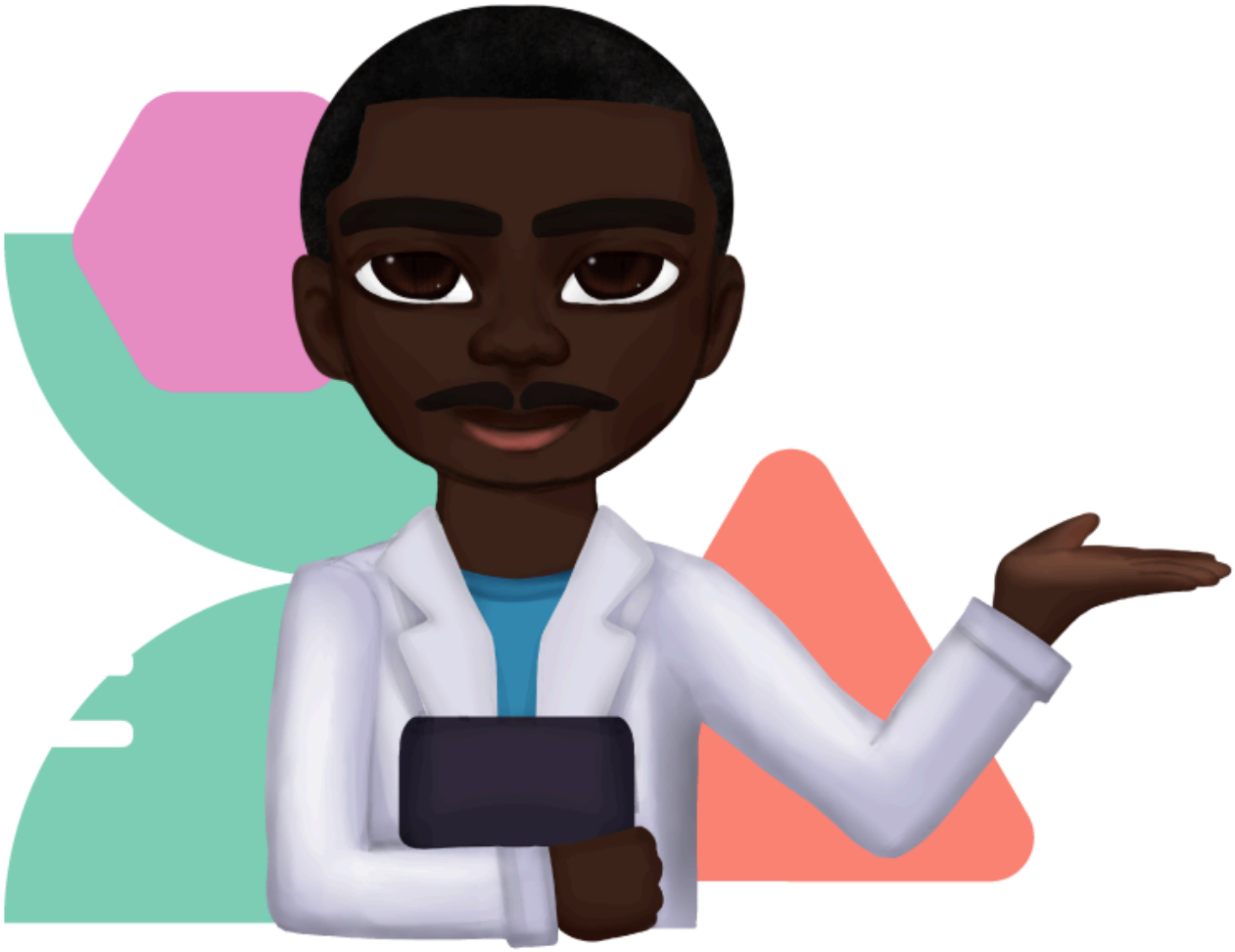

# 2.3 Data ecosystem mapping

Developing a visual representation of the data landscape, illustrating how data flows, how different entities interact with data, and the relationships between various data-related elements

# Why should I do this?

To help you understand the dynamics of the entire data ecosystem within which your investment operates.

# In this activity, you will:

This step is a milestone. Completing it ensures that no loose ends are left and can help prevent emerging blockers, therefore smoothing the pathway to success.

You will create a visual tool that demonstrates how data moves across different personas, platforms and entities within your project. This involves considering stakeholders, data and processes relevant to your investment.

By now, you will have identified your personas and their value exchanges in previous activities. Your next task is to map the pathways that data takes, from collection through to sharing, transformation and use. This map will help to identify bottlenecks, opportunities for improving data flow, and the roles of each entity in maintaining data accessibility, interoperability and reusability.

**1)** If you are a Program Officer (PO), you may want to share this page directly with your grantee, so they can act on it.

**2)** You can use the workbook (and supporting factsheet) for Step 2 here. We recommend using the same document throughout this step, so you have a single document that captures all your workings.

**3)** Putting together the ecosystem map requires inputs from previous activities. Make sure you have completed Steps 2.1 and 2.2 to make it easier for you.

## Phase 1: Preparation and planning

> **Goal setting:** Clarify what you hope to achieve with the data ecosystem map (e.g., improving data sharing, enhancing digital tool adoption, communication with stakeholders).

**Scope determination:** Decide the boundaries of your mapping effort (e.g., specific agricultural value chains or geographic areas).

**List personas:** Identify all potential stakeholders in the digital AgDev ecosystem, including farmers, agribusinesses, tech providers, NGOs, and government agencies. Understand the role of each stakeholder in the digital AgDev ecosystem and their interest in data.

**Value exchanges:** Identify the different tangible and intangible values exchanged between the Personas.

**Enabling and inhibiting factors:** Brainstorm the enabling and inhibiting factors for those value exchanges being made successfully throughout your project.

**Phase 1 suggested resources:** Platforms like Trello, Asana or Microsoft Project can help in defining and tracking project goals. Conduct interviews or focus groups with stakeholders to determine the personas, value exchanges, and enabling or inhibiting factors, in your investment ecosystem.

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## Phase 2: Data collection

### Desk research

**Inventory of digital tools:** Compile a list of digital tools, platforms and services used in the ecosystem.

**Data flows:** Document how data is collected, shared and used among stakeholders, focusing on data exchanges.

**Interviews, focus group discussions, surveys and workshops:** Conduct interviews or surveys with key stakeholders to gather insights on their data practices and needs. Organize focus group discussions and workshops to facilitate collective understanding and gather diverse perspectives on the data ecosystem.

**Phase 2 suggested resources:** Explore directories like AgTech Finder, AgFunder or FarmTable to discover digital tools and platforms used in agriculture.

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## Phase 3: Mapping

**Choose a mapping tool:** Select a digital tool or software that suits your visualization needs.

**Map structure:** Determine your map layout, including nodes (e.g., personas, digital tools) and edges (e.g., relationships, data flows).

**Create initial map:** Using the data collected, start plotting the personas and their data interactions.

**Iterative refinement:** Refine the map based on feedback from stakeholders and additional insights gathered during the mapping process.

**Phase 3 suggested resources:** Try software such as Kumu or Miro to create a map of your ecosystem. Experiment with these digital tools or hand-drawn options depending on your group's preference.

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## Phase 4: Analysis and strategy development

**Gap analysis:** Identify any gaps in data sharing, underutilized digital tools, or missing connections between stakeholders.

**Opportunity identification:** Highlight opportunities for enhancing digital collaboration, data interoperability, and the adoption of digital solutions.

**Strategic recommendations:** Formulate strategies to address identified gaps, leverage opportunities, and improve the overall digital ecosystem.

**Implementation plan:** Outline steps, responsible parties, and timelines for executing the strategies.

**Phase 4 suggested resources**: Use tools like Apache NiFi, Talend or Informatica for data profiling and analysis to identify gaps in data sharing and utilization. Utilize frameworks such as SWOT analysis (Strengths, Weaknesses, Opportunities, Threats) or PESTLE analysis (Political, Economic, Social, Technological, Legal, Environmental) to systematically identify gaps. Conduct scenario planning workshops with key stakeholders to share, consider and evaluate alternative strategic options. Create Gantt charts or roadmaps to visualize the sequencing of activities and dependencies in the implementation plan.

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## Phase 5: Dissemination and feedback

**Dissemination:** Share the completed data ecosystem map with all stakeholders, ensuring accessibility and understanding.

**Documentation:** Provide detailed documentation on the map's development process, key findings and strategic recommendations.

**Feedback mechanism:** Establish channels for stakeholders to provide feedback on the map and suggested strategies.

**Iterative updates:** Plan for regular updates to the map, based on stakeholder feedback and changes in the digital AgDev ecosystem.

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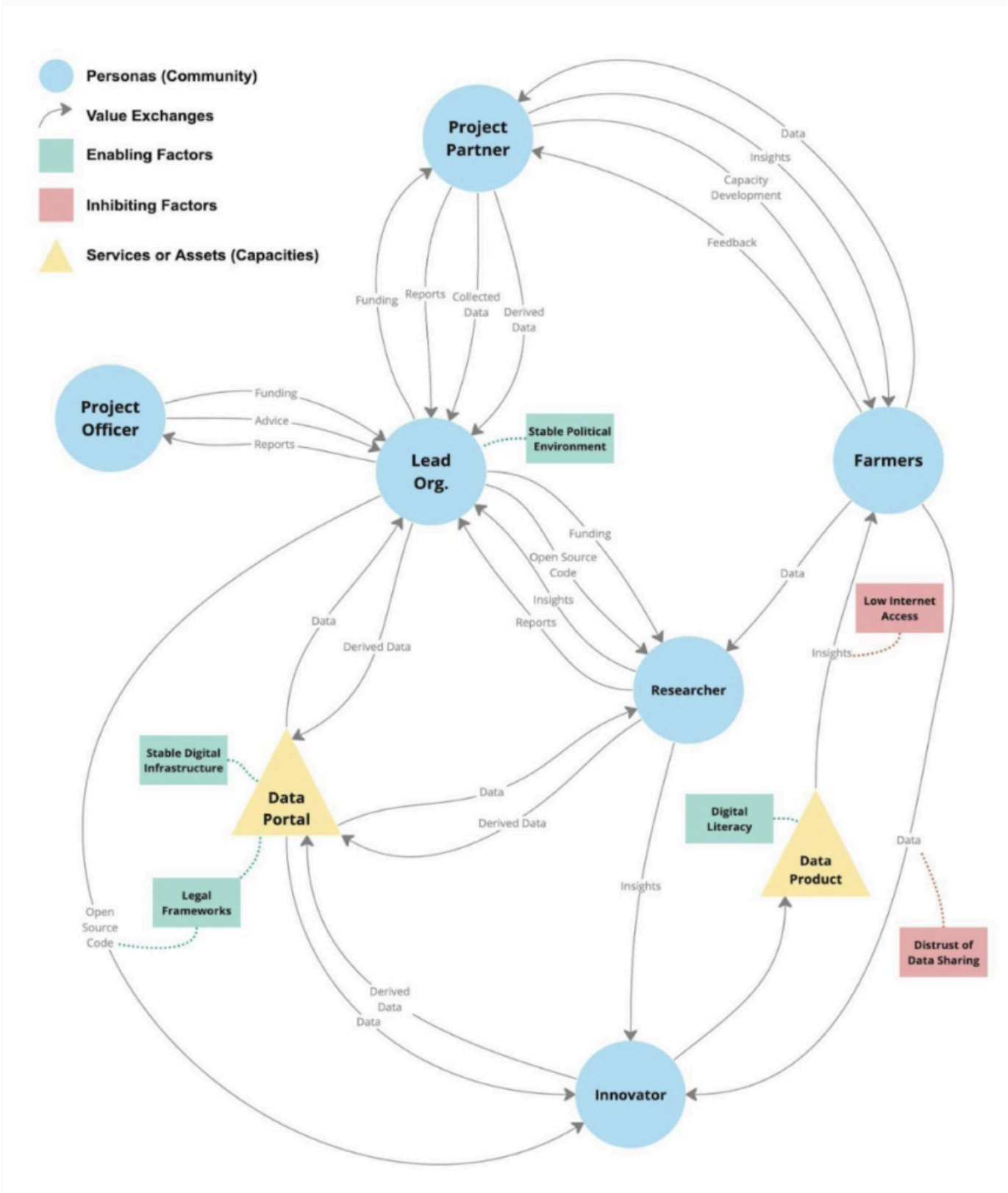
4) Refer to the investment type examples to help you complete your map.




5) Refer to the links for additional examples of ecosystem maps:

Ecosystem map of a typical agronomy project.

Ecosystem map developed by CABI, and featured by Kumu. This visualizes the current state and future vision of a geospatial platform, and was part of an investment on climate-smart landscapes for promoting sustainability of Pacific Island agricultural systems.

6) The document created from all the activities under Step 2 is meant to be a live document. As the investment develops and more information becomes available, the project lead should continue to update it and share it with their Investment Program Officer (PO) and relevant partners. Updating your worksheet gives you the opportunity to assess the new impacts and make changes to your project plans.

# Investment types

# Overview

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## Every investment project is unique

The application of the six steps will vary accordingly. To provide examples that align with your project, common characteristics of AgDev investments were researched and three 'investment types' were developed.

# AgriConnect: a digital solutions investment

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AgriConnect expected to encounter issues during data collection from data sources that are not FAIR. To overcome these challenges, it identified data blockers and levers that facilitate the access to necessary data. Where data is available, especially sensitive or proprietary data, AgriConnect will lead the generation of data sharing agreements to encourage data owners to share their data with AgriConnect, to ensure that the project maintains FAIR compliance, and to reassure data owners that their data will be protected.

AgriConnect decided to develop a comprehensive data ecosystem map.

### Implementation phase

Through close collaboration with data scientists, IT specialists, legal experts, researchers and stakeholders from the agricultural sector, the team worked diligently to ensure that all components of the data ecosystem map were included and aligned with the FAIR Principles. The team conducted regular workshops and interviews to collect necessary data from all participants for creating the data ecosystem map. During those workshops, the team used a tool for ecosystem mapping to ensure all the insights were included.

### Outcomes

This initiative fostered stakeholder engagement and a culture of data sharing and collaboration, leading to innovative solutions to complex agricultural challenges. It also encouraged other organizations to adopt best practices in data stewardship. By prioritizing the FAIR Principles and

implementing a comprehensive strategy focused on technical excellence and open access, AgriConnect has not only enhanced the utility of its new digital platform, but also paved the way for a more collaborative and innovative future in agricultural data management. This case study shows the transformative power of adhering to FAIR principles in building effective and sustainable data ecosystems.

# AgroThrive: a policy and advocacy investment

*©Gates Archive/Thomas Omondi*

AgroThrive's work includes access to credit and affordable financing options for agricultural inputs, infrastructure development (transportation and storage facilities), educational opportunities for smallholders, fostering of technical advancements, climate resilience, and land tenure security. Each of these should also be viewed through an intersectional lens, with special attention given to the inclusion of traditionally marginalized communities. It will also work with officials to increase the state's implementation capacity by helping to improve government planning, accountability, delivery of services, and sector coordination.

AgroThrive decided to develop a comprehensive data ecosystem map.

### Implementation phase

Through close collaboration with social scientists, policy experts, government officials, researchers and stakeholders from the agricultural sector such as farmers and agribusiness, the team worked diligently to ensure that all components of the data ecosystem map were included and aligned with the FAIR Principles. It conducted regular workshops and interviews to collect necessary data

from all participants for creating the data ecosystem map. During those workshops, the team used a tool for ecosystem mapping, to ensure all the insights were included.

### Outcomes

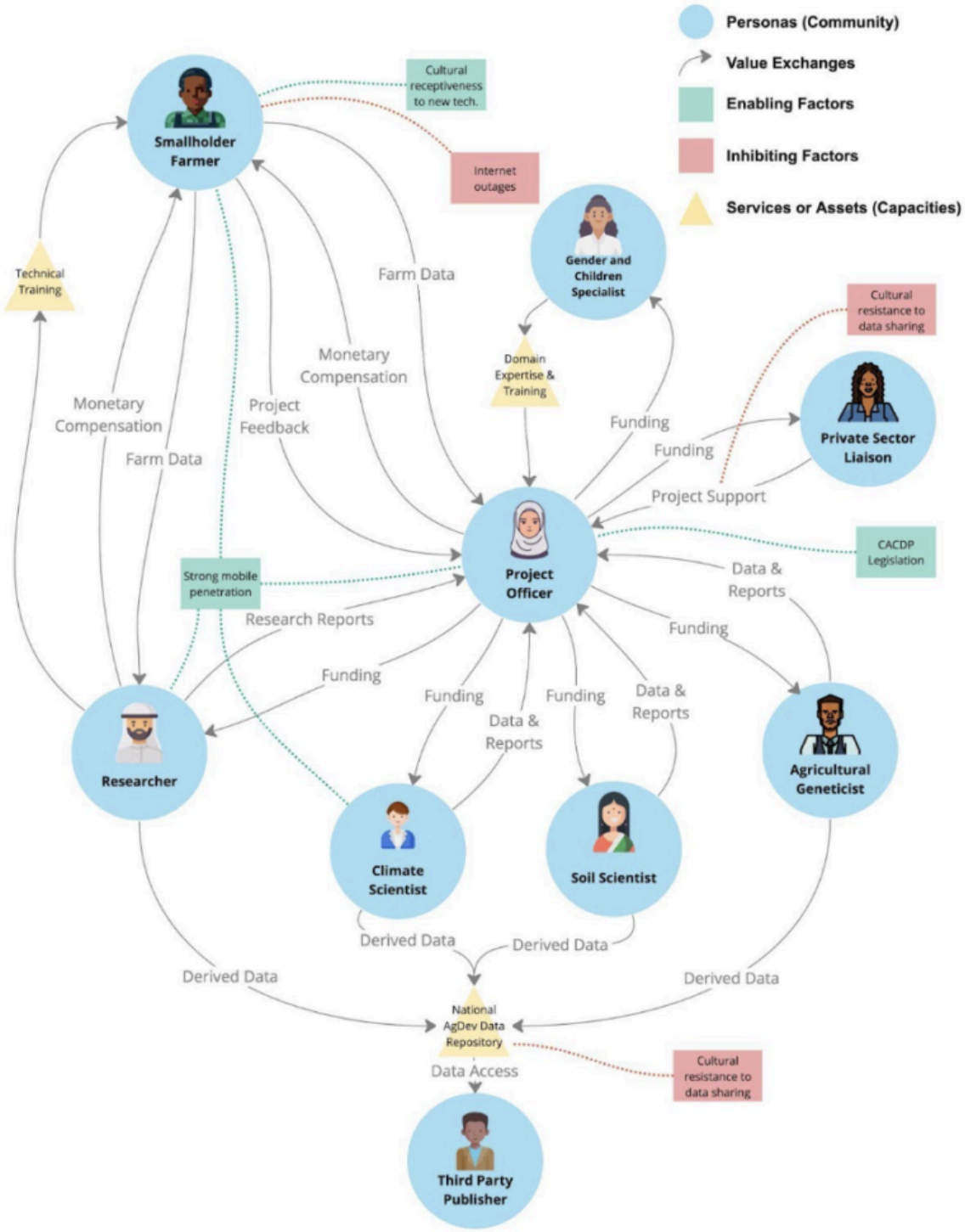
This initiative fostered stakeholder engagement and a culture of data sharing and collaboration, leading to innovative solutions to complex agricultural challenges. It also encouraged other organizations to adopt best practices in data stewardship. By prioritizing the FAIR Principles and implementing a comprehensive strategy focused on technical excellence and open access, AgroThrive has not only enhanced the quality of policy recommendations, but also paved the way for a more collaborative and innovative future in agricultural data sharing for policy design and evaluation. This case study shows the transformative power of adhering to FAIR Principles in building effective and sustainable data ecosystems.

# NGBT: a field research investment

*©Gates Archive/Esther Mbabazi*

NGBT's work will involve both small and large data points, including (but not limited to) historical and current weather data, data on current crop yields and production, land use for agricultural purposes, and government data on the population involved in the production of the target crop.

To understand how agricultural data is collected, shared and utilized across the industry, NGBT decided to develop a comprehensive data ecosystem map.




## Implementation phase

NGBT collaborated closely with climate scientists, soil scientists, agricultural geneticists, women and child experts, government agencies and stakeholders from the agricultural private sector. The team worked diligently to ensure that all components of the data ecosystem map were included and aligned with the FAIR Principles. It conducted regular workshops and interviews to collect necessary data from all participants for creating the data ecosystem map. During those workshops, the team used a tool for ecosystem mapping, to ensure all the insights were included.

## Outcomes

This initiative fostered stakeholder engagement and a culture of data sharing and collaboration, leading to innovative solutions to complex agricultural challenges. It also encouraged other organizations to adopt best practices in data stewardship. By prioritizing the FAIR Principles and implementing a comprehensive strategy focused on technical excellence and open access, NGBT has not only enhanced the utility of its research, but also paved the way for a more collaborative and innovative future in agricultural data management and, ultimately, open science practices. This case study shows the transformative power of adhering to FAIR Principles in building effective and sustainable data ecosystems.

## Ecosystem mapping enabled Program Managers and grantees to home in on existing best practices that can be utilized in different geographies and sectors.

CABI International – the ACIAR case study

**Learn more**

FAIR Process Framework has been developed by the Enabling Data Access (EDA) project team at CABI and is funded by the Bill & Melinda Gates Foundation to support the foundation's Open Access Policy. The FAIR Process Framework is a tool to assist partners in developing data access and management plans (DMAPs) that incorporate FAIR and responsible data practices. 