Global Partnership for Sustainable Development Data

From local needs to local knowledge: better data to end hunger

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Person walking through a rice field in Indonesia.
Credit: Levi Morsy

Introduction

The role of agri-food data and statistics as enablers for development and prosperity

Without accurate and reliable information on agriculture, governments risk investing millions of dollars in the wrong priorities. This leads to losses in productivity and income, perpetuates hunger and poor nutrition—particularly among the most vulnerable—and contributes to environmental degradation.

The COVID-19 pandemic has increased the demand for better data on health, agriculture, and socio-economic systems and demonstrated how governments can and should coordinate data collection, access, and sharing. At the same time, it has exposed the shortcomings of national data and statistical systems and the chronic underinvestment in this area, particularly in low and lower-middle-income countries. Timely, accurate, and reliable data to inform decision-making will be a critical driver for more equitable, inclusive, and sustainable food systems transformation and achieving the Sustainable Development Goals (SDGs) by 2030.

Innovations in digital technology and the use of alternative data sources, such as satellite or citizen-generated data, are helping to fill data gaps and enabling decision-makers to target policies and resources more effectively to support vulnerable communities. Harnessing this potential requires increased investments and a more coordinated and collaborative approach which strengthens national data and statistics systems and supports local knowledge and capacity development.

Agriculture has a major impact on social, economic, and environmental outcomes in many countries. It is an engine of growth for households and a source of employmentand a key driver of food security for countries. Agriculture is also integral to many environmental challenges as farming and livestock cultivation affect land degradation, water use and misuse, pesticide pollution, greenhouse gas emissions, and climate change. Availability and use of good agri-food data and statistics contribute to harnessing the economic and societal opportunities linked to the agricultural sector and limiting negative effects on the environment.

Importance of effective collaboration for the production and consumption of agri-food statistics

Effective collaboration is pivotal to the modernization of statistical production to enhancing trust in the legitimacy of data in food and agriculture sectors. When stakeholders along the data value chain work together, it results in more and better data, more relevant and timely insights for decision-makers, and better use of available resources. Furthermore, as the World Development Report 2021 explains,

"A multistakeholder approach to data management and governance can help institutions keep pace with an ever-evolving data ecosystem and enhance their legitimacy, transparency, and accountability."[1] Therefore, effective collaboration along the data value chain is key to ensuring that good agri-food data and statistics are produced and consumed by all stakeholders.

Additionally, from an agri-food systems data[2] perspective, effective and well-resourced collaboration can substantially support the achievement of the SDGs, as showcased by ongoing projects in Africa and Latin America detailed in this paper. Understanding what drives and what hinders effective collaborations and what the roles of different stakeholders are along the data value chain is important from both national and international perspectives.

Paper overview

The Global Partnership for Sustainable Development Data (hereafter, Global Partnership) is working with partners and allies to build support for more effective financing and collaboration on data and statistics in the food and agriculture sector in the lead up to the **2021 Food Systems Summit**, and the Committee on World Food Security's High Level Panel of Experts (HLPE) report on **data collection and analysis tools for food security and nutrition**.

In April and May 2021, the Global Partnership brought together strategic partners from Africa and Latin America to exchange perspectives on effective collaboration on agri-food data and statistics at the country level, share successes, and increase understanding about what the international community can and should do to support and accelerate progress in this area.

Through key informant interviews and a peer exchange, the Global Partnership consulted a total of 30 experts from 10 countries[3], drawn from ministries of agriculture, food, and the environment, national statistical offices (NSOs), the private sector, and civil society. The peer exchange was also an opportunity for countries to share experiences with one another.

This paper provides a summary of the insights gathered through these activities and includes examples of good practices shared by stakeholders. These insights point to:

- Five key drivers and challenges for effective collaboration for agri-food systems data.
- The roles of diverse stakeholders in supporting effective collaboration.

These country partner insights shaped findings and recommendations in the **Data for food security** report published June 30, 2021 which articulates ways that the international community can improve data for food systems transformation.

[1] World Development Report 2021, Data for Better Lives, World Bank, Chapter 8: Institutions for Data Governance.
[2] According to the Oxford Dictionary of Human Geography, "agri-food systems" (also referred to as agro-food systems) includes "the totality of actors involved in the production, distribution, and consumption of food, the relations between them, and the regulatory apparatus governing these arrangements."
[3] Ghana, Senegal, Togo, Sierra Leone, Puntland State of Somalia, Kenya, Tanzania, Namibia, Uganda, and Colombia. The Global Partnership for Sustainable Development Data extends our sincere appreciation to the country partners who participated in interviews and the peer exchange for their contributions to this report.

A variety of produce in a market in Kenya. Credit: Photos By Beks

The five drivers of effective collaboration on agri-food systems data

Strategy and leadership

The existence of a defined strategy for the production and use of agricultural data is a crucial driver of effective collaboration. Such a strategy should aim to:

a. List and support the implementation of national priorities.

b. Clarify the roles of different stakeholders in the data value chain both within and in partnership with governments.

c. Identify a lead organization responsible for overall implementation.

Strategy roadmaps provide clarity and vision to guide activities and outline the roles and responsibilities of leading and supporting organizations. Such clarity facilitates effective collaboration by stakeholders united through common objectives and concrete outcomes.

The Kenyan experience as shared by the head of the Agriculture Transformation Office (ATO) within the Ministry of Agriculture is a good example of this. In Kenya, the digitalization and coordination of agricultural sector data are anchored in the country's 10-year Agricultural Sector Growth Transformation Strategy (ASGTS), adopted in the context of the devolution efforts. The ASGTS strategy highlights seven digital use cases and priorities based on the SDGs, as shown in Table 1.

Table 1:
Kenyan Agricultural Sector Growth Transformation Strategy (ASGTS) use cases

ASTGS Anchor	Digital use cases to champion until 2023, in line with ASTGS
Increase small-scale farmers' income.	1. Accelerate farmer registration and target eligible farmers with e-incentives using digital tools* and analytics to improve tracking and direct payments to providers.
	2. Improve farmer practices (e.g. input use) by providing farmers with customized e-extension that incorporates current and predictive data (e.g. agro-weather analytics, pest-disease trends, prices).
Boost household food resilience.	3. Monitor emergency food reserve stocks with digital tools* (e.g. ID barcodes), and then improve overall national food balance sheet data to determine future quantity of stock using satellite data and predictive analytics on production, trade, climate.
	4. Make more dynamic trade and price stability decisions using the digital food balance sheet and an Early Warning System (EWS) for food price inflation.
	5. Improve value chain selection with an agricultural land optimization model that responds to the specific outcomes and incorporates climatic expectations and resilience data.
Provide cross-cutting support.	6. Drive monitoring and evaluation with a dashboard to streamline data collection and verification of 10 KPIs linked to the seven use cases (in this table).
	7. Establish standards and protocols for a shared data platform to facilitate more evidence-based interventions among all players.
**Digital tools alone are insufficient to solve all the challenges, but they will support more holistic solutions.*	

Source: presentation by Thule Lenneiye, Coordinator at the Agriculture Transformation Office Ministry of Agriculture Kenya, April 22, 2021.

The ASTGS is backed by a digital transformation roadmap. Kenya's Ministry of Agriculture is working with the private sector to build an interoperable system integrating data and services from public sources (such as Kenya's National Bureau of Statistics) and non-governmental sources of earth observation data. The vision for this platform is to become a resource center for all stakeholders working in agriculture, not

only for government officials but also for academics, donors, those working in non-governmental organizations (NGOs), and other interested parties.

"The existence of an overarching policy framework and strategy, which can be broken down with action plans and more specific initiatives, constitutes one of the main drivers in Kenya for establishing effective collaboration amongst stakeholders."

– Senior official from Kenya Ministry of Agriculture

The importance of having a clear strategy is further confirmed by experiences in Tanzania and Togo. In Tanzania, the government in 2014 developed a five-year agricultural statistics strategic plan with the support of the Food and Agriculture Organization (FAO) that included all statistical activities planned within the timeframe. This plan along with the Tanzanian Statistics Master Plan, which establishes a legal mandate for the National Bureau of Statistics to collaborate with stakeholders in public and private spheres, enabled the establishment of collaborative mechanisms—especially between the Ministry of Agriculture and international organizations. Developing the strategic plan took a collaborative approach as well, including consulting with a wide variety of stakeholders. A second plan is currently being drafted based on lessons learned through the initial plan, and consultations with stakeholders are ongoing.

Togo's head of the Project for the Improvement of the Environmental Information System (Projet d'Amélioration du Système d'Information Environnemental au Togo-PASIET) emphasized the importance of elaborating on a strategic plan and developing a clear vision in planning activities over multiple years. Togo's strategy was developed within the FAO-led project, Global Strategy to Improve Agricultural and Rural Statistics (GSARS), which has also facilitated country progress in terms of collaboration around agricultural data.

In addition to having a strategic plan, experts highlighted the importance of a clear mandate to produce statistics with specific responsibilities assigned to stakeholders. The relevance of a directive for statistical offices to produce authoritative agricultural statistics came across in multiple interviews. Experts highlighted that the absence of a clear mandate for a specific agency to produce data opens the door to different organizations producing contradictory statistics, which can be confusing for data users. This was the case in Tanzania in the 1980s and '90s, for instance. The experiences of Senegal, Sierra Leone, and Ghana also confirmed that collaboration between stakeholders is more easily achieved when there is a clear leading organization and roles with clear expectations.

Relations between stakeholders can be formalized through specific agreements or remain more informal. In Sierra Leone, for instance, the Ministry of Agriculture and NSO have a memorandum of understanding that clarifies roles and responsibilities in the production of agri-food systems data. In other contexts, collaboration along the data value chain takes a more informal shape but is nonetheless clearly organized and rooted in national roadmaps and strategies.

Data platforms for people: putting people at the heart of collaboration

The human dimension of collaboration must come first when developing technical and data-centric initiatives in order to build sustainable and effective data sharing platforms and technology infrastructures. An inclusive approach that brings together both producers and users of data is key to

identifying good governance solutions for collaboration and data-sharing. Establishing dialogue among stakeholders increases trust and is a precondition for identifying and setting up suitable data-sharing infrastructures at the national level.

Senegalese think tank Initiative Prospective Agricole et Rurale's (IPAR) experience through the **AgriData project** revealed that several organizations were producing data independently without interacting. In response, IPAR brought together data producers from both official (Division of Analysis, Forecasting and Agricultural Statistics, *Direction de l'Analyse, de la Prévision et des Statistiques Agricoles DAPSA*, within the Ministry of Agriculture) and non-official sources (NGOs working on citizen-generated data, academia). This allowed IPAR to:

a. Understand "who was doing what" and "which data was available where" in this previously compartmentalized context.

b. Anticipate discussions around governance and collaboration structures and prevent any misunderstanding on leadership.

c. Share experiences and test ideas for collaboration.

As a second step, the AgriData project combined existing data within a single platform to facilitate use and consumption by policymakers. This project demonstrated the importance of solving governance issues first before digging into the technical aspects of data collection, aggregation, and sharing.

Kenya's experience during the COVID-19 crisis confirms the importance of multi-stakeholder platforms. At the beginning of the pandemic, Kenya set up a Food Security War Room with over 50 partners from development agencies, civil society, international organizations, and the private and public sectors. These stakeholders collaborated to share data and information and geotrack markets to ensure food security during the pandemic in the context of mobility restrictions. In this case, as in Senegal, establishing relations among actors was the first essential step to addressing issues of data sharing, governance, and technical aspects.

As these examples suggest, one cannot start from building a technical data-sharing platform and expect that stakeholders will join in to share data. On the contrary, starting by establishing a dialogue between the right stakeholders facilitates trust and leads to technical solutions that are subsequently used by all stakeholders.

Understanding users' needs and establishing feedback mechanisms

Another key lesson relates to the need to understand users and establish communication and feedback mechanisms to share their needs and requirements with data producers.

The Ministry of Agriculture of Ghana through the Statistics Research and Information Directorate (SRID), the institution in charge of statistical production, explained how identifying all data users and their needs as well as consulting with them on an ongoing basis was key to producing useful statistics. Users of agricultural data in Ghana include not only the government but also academia, donors, and farmers' organizations. SRID created several discussion sub-groups focused on different data themes. Stakeholders provide feedback so that SRID can improve over time. Feedback is provided both before the data is released and after so that there is an alignment of expectations between producers and users all along the data lifecycle.
The same lesson emerges from the

aforementioned AgriData project in Senegal. A key takeaway from this project concerned the need to align data supply and demand and to understand users' needs. The project showed the importance of brokers capable of translating policymakers' needs into concrete demands for statistical offices and data producers.

"If the data does not help policymakers to carry out their tasks, it will remain simply unused. Therefore, data producers must build a good dialogue with policymakers and data users more in general and capture their evolving needs and preferences."

– Deputy Director from a Senegalese nonprofit organization operating in the agri-food sector

Representatives from Tanzania's National Bureau of Statistics also emphasized the role of feedback mechanisms between data producers and users. In particular, they highlighted the need to disseminate data and make data available to non-governmental stakeholders, including in the private sector. Data dissemination can help ensure uptake and contribute to strengthening the quality of data through feedback loops.

Overall, experts agreed that users' needs must be considered at every point along the statistical production value chain—from data collection to dissemination—and that aligning demand for and supply of data is key to uptake and consumption.

Statistical capacity and digital skills to use new technologies

Investments in capacity building are pivotal for effective collaboration. Experts agreed that both general capacity-building activities (e.g. those concerning statistical methods and approaches) and upskilling linked to the adoption of new technologies are very much needed. Initiatives such as the FAO-led **Global Strategy to Improve Agricultural and Rural Statistics (GSARS)** and **50x2030** are useful in this context. Countries' experiences also confirm the positive impact of capacity-building on collaboration.

In Senegal, according to stakeholders, the AgriData project illustrated the need to invest in building capacity and in integrating new technologies and data sources such as drones and earth observation data. Ghana's experience highlighted the importance of support for capacity development from donors and multilateral organizations. Through partnerships with FAO and GIZ[4], the Ghanaian Ministry of Agriculture strengthened employee skills, improved equipment and developed, and deployed a new (CATI-based) methodology for data collection in agricultural surveys. This new methodology allows faster and better data production—almost in real-time. These positive results were the result of effective collaboration between development partners and national stakeholders.

As these and other examples suggest, projects and initiatives that include capacity-building dimensions have a positive impact on data producers and strengthen collaboration among stakeholders in agricultural data ecosystems.

Digital infrastructure and digital transformation

Digitalization of data collection and production also emerged as one of the main enabling factors for collaboration on agri-food data and one of the key ingredients that sets up data producers for success. In the context of COVID-19, countries that were

[4] More information on GIZ's activities in Senegal is available **here**.

Aerial view of Lake Retba, Senegal.
Credit: Curioso Photography

already advanced in their digitalization efforts avoided large delays and other challenges in maintaining agri-food statistical activities thanks to their ability to gather data remotely.

In Ghana, the Ministry of Agriculture is currently working with the World Food Programme to monitor food security and nutrition through remote data collection. Farmers are contacted via phone and their data is aggregated by the Ministry of Agriculture information and technology (ICT) unit. This contactless data collection method allowed Ghana's statistical activities to continue throughout lockdown periods. Similarly, in Colombia, data collection activities continued during COVID-19 lockdowns by switching from in-person interviews to phone interviews and online surveys. Conversely, countries in which data collection activities remained paper-based saw significant delays in the production of agricultural statistics during the COVID-19 crisis. This was the case in many Arab League countries, for instance.

As stated by multiple experts, successful digitalization efforts in the agriculture sector require solid technological infrastructure including, notably, internet connectivity, hardware and software for data processing, and investments in technological tools and upgrades. Countries that invest in such infrastructure can collaborate more effectively with various stakeholders. Experiences from the private sector show, for instance, that countries in which mobile phone penetration rates are higher can leverage better remote (i.e. phone-based) data collection opportunities. In this respect, experts agreed that central governments and international organizations play a pivotal role in establishing capable technological infrastructure.

The five challenges for effective collaboration for agri-food systems data

From discussions with country partners, five main challenges for effective collaboration on agriculture and food systems data emerged.

Lack of investment in agri-food systems data and statistics

Lack of investment stands out as the biggest challenge faced by countries, as most developing countries do not have sufficient financial resources to produce agri-food data or statistics. Particularly, the availability of resources for carrying out large agricultural surveys and agricultural census is a struggle in most countries. Surveys and censuses are often delayed due to lack of funds. This has profound consequences on the timeliness of available data.

Lack of funding is also detrimental to the digitalization of the sector. While digitalization can reduce costs in the medium- to long-term range (i.e. by enabling remote data collection), many countries cannot afford the upfront investment required for digitalization. Such lack of investment, however, not only affects data collection activities but also more generally impacts the quality and availability of data, the data infrastructure, and the ability to train and upskill public authorities tasked with data collection and analysis. There is a pressing need to close this investment gap to enable countries to take advantage of new technologies and data sources, such as satellite and citizen-generated data.

Resilience in digital innovations

Sustainable and long-term financing for agri-food data collection and publication emerged as a significant challenge in most countries. Furthermore, while private sector agencies can help to establish tools like data platforms, short-term collaborations do not guarantee the functionality of or funding for technological solutions in the long run.

Several experts mentioned that the sustainability of project outcomes was the biggest issue they faced. Projects funded by international organizations and donors can produce effective and innovative results, but these activities tend to stop when a project ends due to the absence of in-country sustainable financing. As a result, data platforms, technological tools, and collaborative approaches developed during these projects are often short-lived.

Stakeholders from several countries agreed that—particularly in Africa—there is an over-reliance on donors to fund and sustain digital innovations, risking the resilience of a country's statistical production systems. They argued that financing for data and statistics should be ensured through national resources

and that the dependency on donors creates a risk of financing projects and initiatives that do not correspond to country priorities even as projects of importance from the national perspective are underfunded or discontinued.

Lack of statistical capacity and digital skills

Skills related to agricultural surveying and using administrative data for agricultural statistics are often lacking at the country level and need to be strengthened. Furthermore, digital skills and the ability to use new technologies for data collection and analysis need to be improved both within and outside of the public sector. This lack of knowledge and capacity affects data quality, especially during the transition phases from paper-based to digital data collection. Countries recognized the struggle to upskill their administrations in charge of agri-food data and statistical production and the need for international support in this area.

Related to this is the issue of talent retention in the public sector. Skilled professionals who have received training often leave the public sector because they find more attractive job offers elsewhere. This makes workforce upskilling an even more challenging task for public administrators.

Misalignment between existing data and data needed by policymakers

It often occurs that the data that is available is not what policymakers need. Such data, therefore, remains underused.

"For instance, most agricultural data and statistics focus on agricultural production while there is a demand for more information on food security and food systems."

– Director, Ghana Ministry of Food and Agriculture

This creates a cycle: Since policymakers cannot answer their questions with available data, they underestimate the importance of investing in creating more and better data as a result. In this context, connecting data producers with academics, policymakers, and other users is crucial to produce information that meets users' needs.

Similarly, while feedback mechanisms are an important enabler of effective collaboration, they also present challenges in some countries, especially in terms of how feedback is provided to farmers who share their data to produce statistics. Without an effective feedback mechanism in place, the links between the data collected and outcomes are not clear. This can generate "survey fatigue" among farmers and damage stakeholders' trust.

This lack of alignment combined with weak feedback mechanisms affects coordination and hampers statistical production and usability of data across sectors.

Insufficient access to new sources of data

Limited access to new and innovative sources of data such as earth observation and 'Big Data' also constitutes a challenge in countries. According to experts, most developing countries have neither direct access to these data nor the infrastructure and capacity to store, process, and analyze them. Thus, they rely on the private sector to access such information—an issue that raises questions of continuity, sovereignty, and financial implications.

Two men working in a field in Ghana. Credit: GPSDD, Jordi Perdigo

Roles of stakeholders in supporting effective data collaboration on agri-food systems

Country partners agreed that the production and use of agricultural and food systems data involve many stakeholders from different sectors who each play an important role in the data value chain. Organizational structures, institutions, and practices vary in every country. As such, the responsibility for developing and overseeing strategies and roadmaps for effective collaboration on agri-food systems data relies on different organizations (i.e. ministries of agriculture, statistical offices, or national governments) depending on the national situation.

Nonetheless, some shared expectations concerning the main stakeholders that are most frequently involved in the production and consumption of agri-food statistics can be identified. Table 2 summarizes the potential roles and activities of different stakeholder groups at the country level that emerged during the consultation process with partners.

Table 2: Roles and activities of potential stakeholders in producing agri-food systems data

Stakeholder	Roles and activities
National governments	• Provide the enabling environment for data collaboration, such as leadership in developing a national data strategy, guidelines for data sharing and use, directing organizations to lead on data collection and production, and prioritizing areas for collaboration. • Ensure sufficient budget is available and increase investments in surveys and other data production methods. • Provide support in areas such as standards, data anonymization, and security together with NSOs (see below). • Ensure a robust and up-to-date technological infrastructure is available (internet access, data warehouses).
Ministries of agriculture	• Plan data collection needs and activities in collaboration with all relevant stakeholders. • Collaborate closely with the NSOs to ensure the data meets users' needs. • Coordinate among producers and users of data.
Ministries of environment	• Produce data and analysis on sustainability and on the impact of agriculture and food systems on the environment
National statistical offices	• Work with ministries to provide common methodologies, concepts, and definitions for collecting indicators specific to policymakers' and other stakeholders' needs. • Coordinate with other stakeholders to produce statistics. • Define standards and set benchmarks for what constitutes good statistical procedures and help other bodies to collect data that meets international standards and identify capacity gaps. • Ensure that country master sampling frames (surveys and census) are available and accessible.
Private-sector actors	• Create the ICT tool to enable easy data collection and sharing. • Engage in all the steps of the statistical value chain, from production to dissemination. • Strengthen alignment with government standards so that ICT products and services are usable by governments and fit for purpose. • Whenever possible, share their data with public authorities.

Cassava farming in Sierra Leone. Credit: Annie Spratt

Stakeholder	Roles and activities
Academic institutions and researchers	• Collect data from all stakeholders to carry out analysis and leverage available knowledge. • Provide theoretical knowledge and models which can be used to analyze data as well as knowledge of specific contexts.
Donors and international organizations	• Support governments in implementing data strategies and align priorities with government investments and strategies. • Support in-country data collaboration. • Support investment in digital infrastructure. • Support institutions that generate agriculture and food systems data. • Provide methodological and technological support for capacity building. • Encourage governments to invest additional resources in the production of agricultural statistics. • Ensure coordination among development partners.
Civil society networks and organizations	• Maintain the production of ground truth data (citizen-generated data) and hold governments accountable for the data they produce and publish. • Ensure adequate policy and legal frameworks exist to protect citizens' rights. • Use data provided by official sources and provide feedback to improve its accuracy and utility. • Support capacity building and use of data for their constituencies. • Carry out research and test new approaches for data collection and analysis (as entities that are less risk-averse than governments). • Provide support in areas such as experimentation and interoperability.

Women carrying firewood in Sierra Leone.
Credit: Annie Spratt

Conclusion

The insights from country partners gathered in this paper highlight that, despite significant gains in strengthening agriculture and food systems data, more needs to be done and challenges persist. Agriculture has a huge impact on social, economic, and environmental outcomes and is an engine of growth for households and countries. This signifies the importance of ensuring that the sector has robust systems and processes that inform policy decision-making.

Country stakeholders who engaged in generating this paper understand what effective collaboration for agriculture and food systems data looks like, namely: a strategy and roadmap with clear roles and responsibilities, putting people at the heart of collaboration around data, understanding user needs, investments in capacity building, and sufficient and suitable technological infrastructure. The success of these ingredients is anchored in having sufficient financial resources to enable the generation of more and better agriculture and food systems data. Sufficient funding emerges among the primary incentives for and drivers of collaboration among stakeholders to pool often-scarce, available resources. As one senior Arab League official explained: "If governments do not allocate funding for an important topic such as agriculture and food statistics, they cannot expect their sustainable development objectives to be achieved. Even small investments matter, but countries must show that they are committed to developing better agricultural and food systems and find incentives from within to improve in these areas."