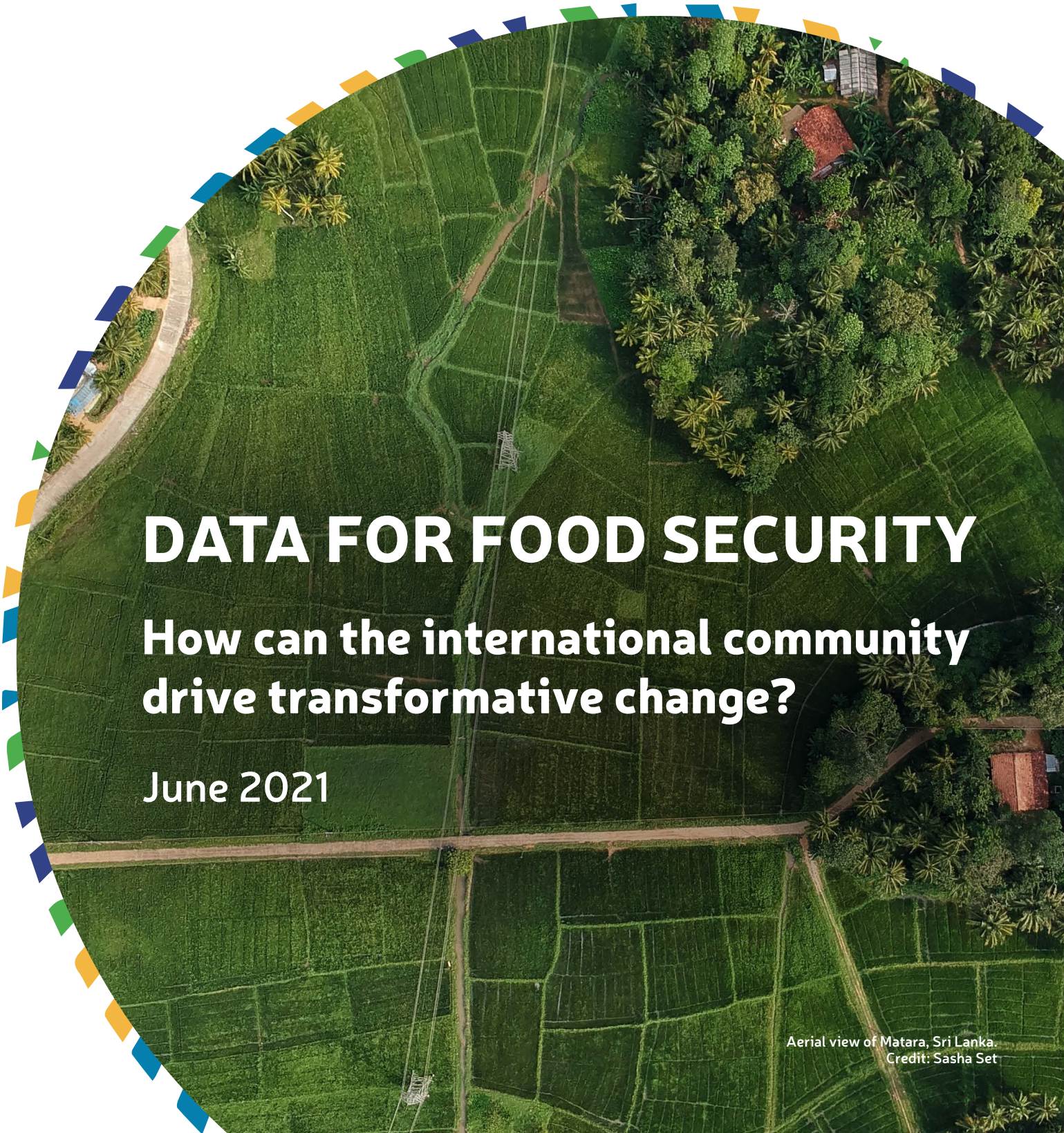
Global Partnership for Sustainable Development Data



DATA FOR FOOD SECURITY

How can the international community drive transformative change?

June 2021

Aerial view of Matara, Sri Lanka.
Credit: Sasha Set

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Acronyms

FAO	Food and Agriculture Organization
GSARS	Global Strategy to Improve Agricultural and Rural Statistics
IFAD	International Fund for Agricultural Development
IT	Information Technology
ODA	Official Development Assistance
SDGs	Sustainable Development Goals

Executive Summary

The COVID-19 pandemic has dramatically impacted the livelihoods and food security of people living in some of the world's poorest places and continues to do so. Unreliable, patchy, and out-of-date data on agri-food systems means that many countries are "flying blind" when it comes to developing evidence-informed policies for reducing hunger, improving food security and nutrition, and ensuring sustainable food supplies. Despite global commitments, there has been chronic underinvestment in data and statistics at the country level. Governments, donors, and international organizations are not keeping pace with the need for effective data systems to drive transformational change for inclusive, sustainable and equitable agri-food systems.[1]

From December 2020 to April 2021, the Global Partnership for Sustainable Development Data convened a series of informal dialogues and key informant interviews with experts from over forty organizations, including Rome-based member states, donor agencies, international organizations, the private sector, civil society, and country partners in Africa and Latin America.[2] Stakeholders exchanged experiences on how to scale up investment and increase the effectiveness of collaboration on data and statistics for agri-food systems and shared perspectives on what the international community can do to support and accelerate progress. This report summarizes key findings from those discussions.

Digitalization and the use of new technologies and alternative data sources, such as satellite imagery and citizen-generated data, are accelerating collaboration on agri-food systems. However, lack of investment in national data and statistics systems is hindering countries from harnessing this potential. Donors are facing challenges in financing agricultural data and statistics as historic investments have been ineffective and unsustainable.

"Data and statistics are like oxygen for the economic development of developing countries. Without good data and statistics, you cannot make it."

– Senior Official National Bureau of Statistics Tanzania

[1] According to the FAO Strategic Framework (2022-2031), the agri-food system "covers the journey of food from farm to table - including when it is grown, fished, harvested, processed, packaged, transported, distributed, traded, bought, prepared, eaten and disposed of. It also encompasses non-food products that also constitute livelihoods and all of the people as well as the activities, investments and choices that play a part in getting us these food and agricultural products."

[2] A list of organizations is attached in Annex 2.

Effective collaboration is fundamental for the modernization of statistical production and for enhancing trust and legitimacy of data and statistics in the food and agriculture sector. When stakeholders along the data value chain collaborate, the result is more and better data produced, more relevant and timely insights for decision-makers, and better use of the available resources, as well as enhanced digitalization.

This requires inclusive and multi-stakeholder approaches that can enhance trust and support data governance and sharing. The Food and Agriculture Organization (FAO) can play a vital role in this area but is facing challenges that need to be addressed in the financing, visibility, and effectiveness of its data and statistical work and country-level support.

Key findings

1. **Lack of investment in national foundational data and statistics systems is the biggest challenge countries are facing.** Many low- and lower-middle-income countries do not have sufficient financial resources to produce agri-food data and statistics, and investing in this area is rarely a political priority for donor organizations.

2. **Investments in agri-food systems data and statistics face effectiveness and sustainability challenges.** Limited coordination internally and among development partners on agricultural data and statistics has contributed to a proliferation of initiatives and data collection activities that risk duplication or may undermine country-led efforts to use data to inform decision-making on agri-food system policies.

3. **Inclusive and multi-stakeholder approaches are critical for data governance and sharing.** Establishing dialogue between stakeholders—both producers and users of data, state and non-state actors—increases trust and is a precondition for finding good governance solutions for collaboration on data and setting up suitable data-sharing infrastructures.

4. **Digitalization and the use of alternative data sources are key enablers of more effective collaboration in data and statistics for agri-food systems.** The use of new technology and alternative data sources is accelerating innovation and development in general and within the agri-food sector in particular, bringing different stakeholders together around a transformative agenda. Traditional data sources such as household surveys and agricultural censuses are required to harness this potential.

5. **The FAO has a well-recognized mandate as a producer, convener, and standard-setter on data and statistics for agri-food systems and could play a vital role in this area.** However, it is facing challenges in the financing, visibility, and effectiveness of its data and statistical work and country-level support.

The report sets out a number of emerging recommendations on how stakeholders can improve collaboration on data and statistics for agri-food systems at national and international levels. Key recommendations are highlighted on the next page.

Golden dust rises from a field as a farmer tills it with his plough animals.
Credit: United Nations Photo/John Isaac

Key recommendations

1. **Governments and donors should scale up and improve the effectiveness of investments in data and statistics for agri-food systems.**

- Raise awareness among senior decision-makers within their organizations at the national and global levels on the value of data and the benefits of investing in robust national data and statistics systems.
- Support the development of national data systems, statistical capacity, and digital skills that enable countries to meet and monitor the Sustainable Development Goals (SDGs).
- Accelerate action to support FAO's digital transformation by ensuring more predictable and sustainable investment and support for its data and statistics activities.

2. **Governments should improve collaboration on data and statistics for agri-food systems at national and subnational levels.**

- Invest domestic resources in the digitalization of data collection and production activities.
- Develop national data strategies for collaboration on agri-food system data, including guidelines for data sharing and use, legal mandates, and the roles and responsibilities of different actors in the data value chain, including donors and international organizations.
- Adopt an inclusive and multi-stakeholder approach that strengthens data governance and sharing, and establish mechanisms to connect data producers with data users including affected communities.

3. **The FAO should improve the visibility and effectiveness of its data and statistical work and country-level support.**

- Develop a clear vision and integrated data strategy on innovation and digital transformation, supported by a framework for strategic oversight and data governance.
- Provide guidance and thought leadership to the international community on how new and traditional data sources should be integrated and future-proofed.
- Promote the establishment of a platform or mechanism for international organizations, and particularly Rome-based agencies (RBAs) to regularly interact with members on data and statistics issues related to agri-food systems.

4. **Donors should take steps to improve coordination on data and statistics for agri-food systems.**

   - Support data collection activities that align with countries' priorities and join up data and statistics investments for improved outcomes.
   - Establish a community of practice to share stories of impact to build the case for supporting data and statistical systems as a strategic investment to drive food systems transformation.
   - Explore options for improving donor harmonization on results monitoring frameworks.

5. **Non-governmental stakeholders should improve collaboration on data and statistics for agri-food systems.**

   - Support national priorities and country-led efforts to use data to inform decision-making on agri-food systems policies, including sharing good practice on responsible data sharing and use.
   - Explore opportunities to collaborate with state actors and international organizations on supplementing and validating official data sources, including facilitating access to new and alternative sources of data.
   - Strengthen and scale up support for statistical capacity-building and digital skills to use new data sources.

Introduction

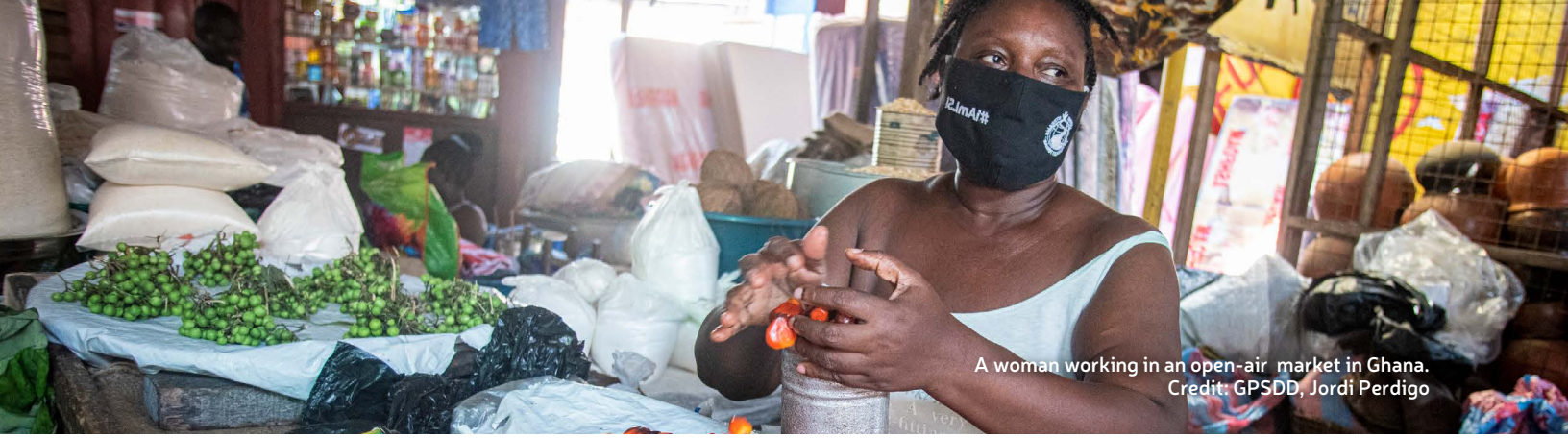
"The international community needs to understand what we do, why and where at the country level to support agricultural transformation, and hit hunger on the head. How can we make sure populations are food secure? How can we identify the most vulnerable? This needs a more structured dialogue to surface whether data is lacking, poor, or out of date, and where further investment is required to fill those data gaps."

—Senior official, UK Foreign, Commonwealth and Development Office

Every year governments in low and lower middle-income countries invest millions of dollars in agriculture without accurate and reliable information.[3] This blind approach leads to losses in productivity and income, contributes to environmental degradation, and perpetuates hunger and poor nutrition, particularly among the most vulnerable. An estimated 690 million people around the world are hungry at the time of this report's publication, an increase of 60 million people over the past five years, and it is predicted that the COVID-19 pandemic may have pushed an additional 83 million-132 million into chronic hunger in 2020.[4]

[3] It is estimated that nearly $190 billion is invested in low- and middle-income countries without sufficient and reliable data. See FAO, The Future of Food and Agriculture: Trends and Challenges (Rome, 2017). http://www.fao.org/3/i6583e/i6583e.pdf

[4] FAO, IFAD, UNICEF, WFP, and WHO, The State of Food Security and Nutrition in the World 2020: Transforming Food Systems for Affordable Healthy Diets (Rome, 2020).



A woman working in an open-air market in Ghana.
Credit: GPSDD, Jordi Perdigo

The COVID-19 pandemic has increased the demand for more accurate, timely data on both its health and socio-economic impacts. It has also exposed the shortcomings of global and national data and statistical systems and the chronic underinvestment in this area in low- and lower-middle-income countries. Timely, accurate, and reliable data and tools will be critical to enable decision-makers to understand the benefits and costs of policy interventions, balance trade-offs and take informed decisions to ensure a more equitable, inclusive, and sustainable agri-food systems transformation and to achieve the SDGs by 2030.

Innovations in digital technology and the use of alternative data sources have decreased the cost and increased the speed of data collection and use.[5] Countries are combining satellite and ground data with weather forecasts to project food production and get early warnings of potential crop failure in order to better plan support to small-scale farmers and vulnerable communities.[6] Harnessing this potential requires increased investment by donors and governments and a more effective approach that strengthens foundational data systems and governance frameworks and supports local knowledge and capacity development.

This report aims to:

1. Explore how stakeholders are collaborating on the production and use of agri-food systems data at the country level, identifying what is driving success or hindering progress.
2. Assess trends in donor financing for data and statistics for agri-food systems, examining challenges and incentives for increasing investment and the unique role of the FAO.
3. Propose recommendations on what the international community can do to support and accelerate progress in this area.

The paper is informed by a desk-based literature review and a series of informal dialogues and key informant interviews with Rome-based representatives from European and G77 countries, senior officials from major donor agencies and international organizations, and key experts from ministries of agriculture, food and the environment, National Statistical Offices, the private sector, and civil society in Africa and Latin America over the period of December 2020 to April 2021.

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[5] Karen Bett, "Agriculture Data Shaping Policy and Changing Lives in Kenya and Tanzania" (GPSDD, May 31, 2019). https://www.data4sdgs.org/resources/agriculture-data-shaping-policy-and-changing-lives-kenya-tanzania

[6] NASA Harvest, "Using Satellites and Machine Learning to Protect Food Security in Eastern Africa," EurekAlert! (February 15, 2020). https://www.eurekalert.org/pub_releases/2020-02/uom-usa021520.php

Chapter 1: Why does data matter for agri-food systems transformation?

Without the right data it is impossible to formulate evidence-based policy, know if interventions are having the desired impact or unintended consequences, or track changes over time. For example, measuring the productivity and incomes of small-scale food producers is critical for tracking progress toward SDG target 2.3, which aims to double agricultural productivity and increase the incomes of small-scale food producers by 2030. Globally, data on the productivity of small-holder farmers is available in only 11 countries and data on the livelihoods of small-holder farmers is available in just 38 countries.[7] Understanding the impact of policies on different population groups is essential for meeting the commitment to leave no one behind. However, less than 10 percent of countries are able to collect or publish agri-food systems data at the required level of disaggregation.[8]

Initiatives such as the FAO-led Global Strategy to improve Agricultural and Rural Statistics (GSARS) and 50x2030, implemented by the International Fund for Agricultural Development (IFAD), FAO and the World Bank, are playing a key role in bridging some of these data gaps and supporting the capacity of low and lower-middle-income countries to produce and use foundational agricultural data for policy making and SDG monitoring. At the same time, advances in technology are also changing the way that data is collected, shared, and used. Governments and non-state actors are increasingly using digital technologies and adopting new and alternative data sources and approaches to fill data gaps, provide insights on complex development challenges, and support innovation.

An analysis of data needs and gaps on agri-food systems is outside the scope of this report and will vary from country to country, however Annex 1 provides some indicative examples (both from traditional and alternative data sources), of the types of data and statistics that can be used to support decision-making for food security and nutrition and to inform policies for the transformation of food systems.

Estimating the value of data to calculate a return on investment and incentivise investment is notoriously complex (see Box 1). Nevertheless, new partnerships are being developed, such as the

[7] FAO, Tracking Progress on Food and Agriculture-Related SDG Indicators 2020 (Rome). http://www.fao.org/sdg-progress-report/en/

[8] FAO, Guidelines on Data Disaggregation for SDG Indicators Using Survey Data (Rome, 2021). http://www.fao.org/3/cb3253en/CB3253EN.pdf

A farmer working in the fields of Baguio, Benguet, Philippines.
Credit: Nathaniel Sison

Africa-Europe Digital Economy Partnership, which places the data economy at the heart of digitalization efforts. More work will be needed in terms of investment, capacity development, governance structures, technical infrastructure and sharing and integrating data in an inclusive and equitable manner to ensure that all countries can benefit from these opportunities. The 2021 World Development Report has called for a new social contract for data, founded on value, trust and equity, which supports integrated national data systems and requires proper financing and incentives to produce, protect, and share data and bridge the digital divide.[9]

Box 1: Assessing the value of data

The economic value of Landsat satellite data has been estimated at $2 billion/ per annum; however, this does not take into consideration the broader economic, societal, or environmental benefits.[10] The European Data Strategy predicts the value of the EU's data economy to be EUR 829 billion by 2025. Value of Data Case Studies highlight the impact of data and show that investing in data systems, capacities, technologies, and processes is relatively inexpensive, and often lead to long-term cost efficiencies as well as sustained social impacts and positive development outcomes. In general, access determines how much of the potential value of data can be unlocked and who can benefit from that data.[11]

[9] World Bank, World Development Report 2021: Data for Better Lives, (Washington, DC, 2021). https://www.worldbank.org/en/publication/wdr2021

[10] Holly M. Miller, et al., Users, Uses, and Value of Landsat Satellite Imagery: Results from the 2012 Survey of Users (US Geological Survey, 2013). https://pubs.er.usgs.gov/publication/ofr20131269

[11] Open Data Institute and the Bennett Institute for Public Policy, "The Value of Data Summary Report/2020." https://www.bennettinstitute.cam.ac.uk/media/uploads/files/Value_of_data_summary_report_26_Feb.pdf

Chapter 2: What is the state of financing for data and statistics?

The 2030 Agenda for Sustainable Development recognizes the critical role of data in providing actionable information to meet the SDGs and to monitor their progress. It includes the commitment to strengthen country capacity, including through technical and financial support and by strengthening national statistical capacities and systems.

In 2017 the Development Cooperation Report highlighted the need for stronger political leadership, greater investment, and more collective action by development actors to bridge the data divide for development.[12] However, the current investment in data and statistics is insufficient to meet SDG needs. While demand for high-quality data and statistics has never been higher, total official financial assistance has remained stagnant over the period 2010-2018, representing an average 0.33% of ODA and amounting to $624 million in 2018. It is estimated that official development assistance (ODA) for data and statistics will need to at least double to 0.7% per year ($1.3 billion) to finance the modernization and strengthening of national data and statistical systems.[13] A predicted overall reduction in donor budgets owing to COVID-19 risks reducing support for aid to data and statistics even further.

The Bern Network on Financing Data for Development is calling for bilateral and multilateral donors, foundations, and global funds to commit to increasing financial support to data and statistics and to leverage sectoral data investments and make them more sustainable by connecting them to national data and statistical systems (see Box 2).

2.1 Main funding modalities for agricultural data and statistics

Most low- and lower-middle-income countries struggle to mobilize domestic resources to finance the production and use of agri-food data and statistics, and as a result, particularly in Africa, there is an overreliance on external funding, which creates important risks for the resilience of

[12] OECD, "Development Cooperation Report 2017: Data for Development" (Paris, OECD Publishing, 2017). https://www.oecd-ilibrary.org/development/development-co-operation-report-2017_dcr-2017-en

[13] Total cost estimates range from $2.9 billion to $5.6 billion per annum for low- and low-middle-income (IDA) and upper-middle income (IBRD) countries. Rachel Calleja and Andrew Rogerson, Financing Challenges for Developing Statistical Systems, PARIS21 Discussion Paper No. 14 (January 2019), and Bern Network, "Financing More and Better Data." https://paris21.org/sites/default/files/2019-01/Financing%20challenges%20for%20developing%20statistical%20systems%20%28DP14%29.pdf

Box 2: The Bern Network on financing data for development

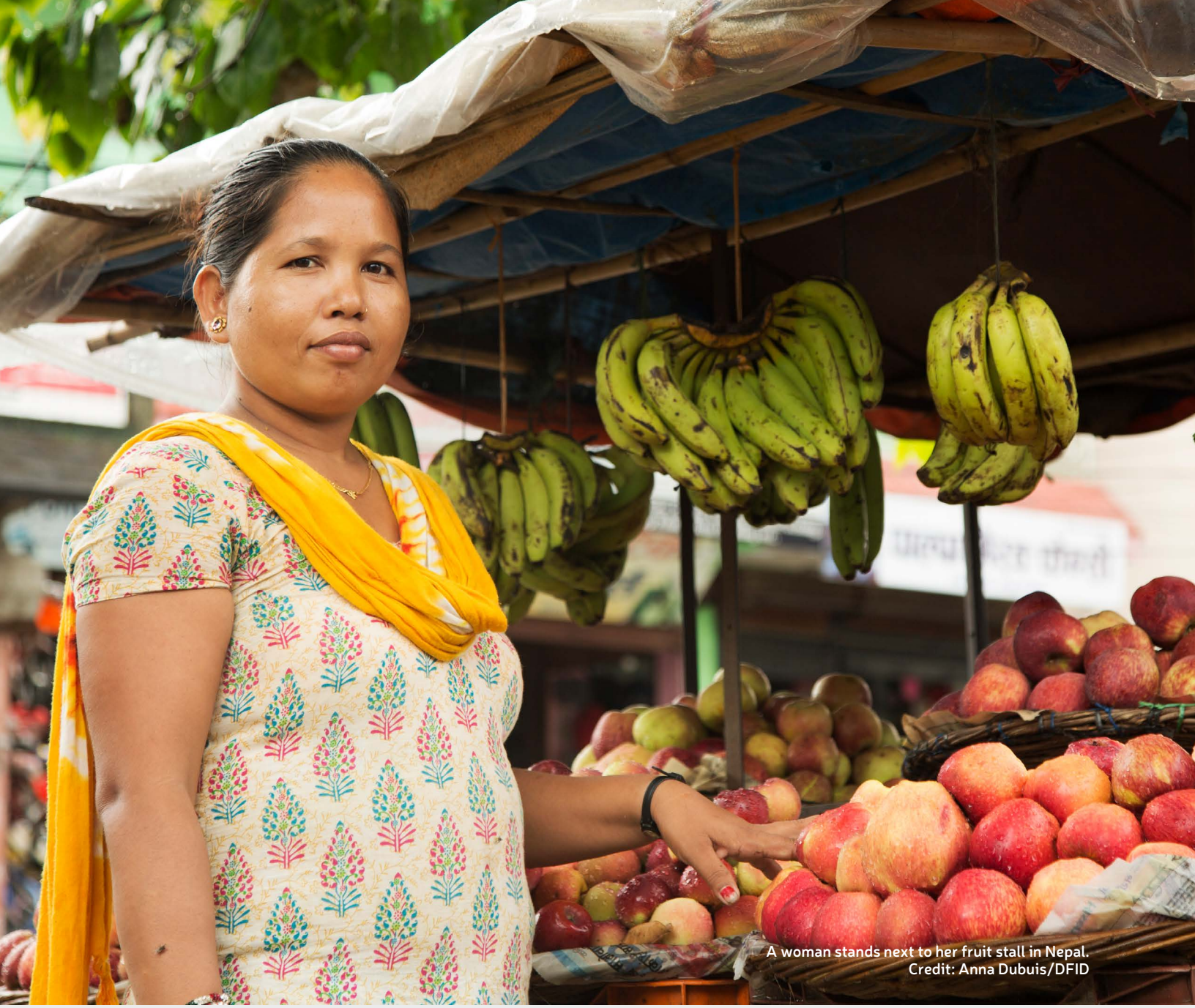
The Bern Network is an open, multi-stakeholder alliance that promotes more and better financing for development data to advance the 2030 Agenda for Sustainable Development. The Network is developing a Clearinghouse for Financing Development Data, an online platform to help countries, donors and development partners identify funding opportunities, bring projects to scale, advocate for support to data and statistics and connect to new partners.

countries' statistical production systems. For example, there is wide variation in donor support for agricultural data and statistics in terms of policy priorities, modalities, channels, and cooperation partners among the donor agencies interviewed for this report. Funding for agricultural data and statistics is usually a mix of bilateral and multilateral support, very often linked to donor policy objectives or results-monitoring frameworks, changing aid allocation modalities, and delivery mechanisms. These can range from contributions to multilateral organizations or non-governmental organizations, technical or capacity-building support by national statistical offices, and contributions to pooled programs.

The FAO was one of the top ten providers of support to data and statistics from 2016 to 2018 and is one of the main channels through which donors finance and implement countries' statistical capacity-building for agriculture.[14] The organization has a key mandate and essential role in supporting collaboration on data and statistics at both the global and country levels. The organization supports efforts to develop, disseminate, and implement international standards and guidelines for statistical activities. This enables data to be comparable across countries so that it can be used to compare performance and monitor progress on the SDGs. FAO also supports countries to build their statistical capacities and systems. The GSARS, Technical Cooperation Programmes, the "Voices of the Hungry" project,[15] and the Integrated Agricultural Survey System are the main investment mechanisms.

The World Bank, FAO, and the IFAD are increasing efforts at inter-agency collaboration on agricultural data and statistics. The agencies are jointly implementing the 50x2030 initiative, which aims to increase the capacity of 50 low and lower-middle-income countries to produce and use agricultural data for policy making and SDG monitoring over the next 10 years via a modular survey approach. The initiative uses an innovative funding mechanism, by leveraging donor funding to mobilize domestic resources and governments are required to share and assume full financial and technical responsibility over the long-term. In addition efforts are being made to maximise synergies between capacity-building initiatives in the sector, see Box 3.

[14] Lange, S. (2020), "Key trends in development co-operation for national data and statistical systems", OECD Development Policy Papers, No. 31, OECD Publishing, Paris, https://doi.org/10.1787/1ce044d2-en
[15] http://www.fao.org/in-action/voices-of-the-hungry/en/



A woman stands next to her fruit stall in Nepal.
Credit: Anna Dubuis/DFID

Box 3: Increasing synergies on capacity-building for agricultural data and statistics

GSARS lays a foundation to strengthen the capacities of countries to produce, analyse, and use data, including eligible 50x2030 countries. Countries' eligibility depends on income classification, regional affiliation and agricultural statistical capacity. At the time of writing, nine countries participating in GSARS were in the process of being officially onboarded in the 50x2030 programme and at least 10 additional countries manifested a strong interest to candidate to the next application window. This means that by July 2021 at least 80-90% of GSARS countries will be in the process of joining the 50x2030 initiative, thus guaranteeing a strong synergy between the two initiatives.

Chapter 3: How are stakeholders collaborating on agri-food systems data at the country level?

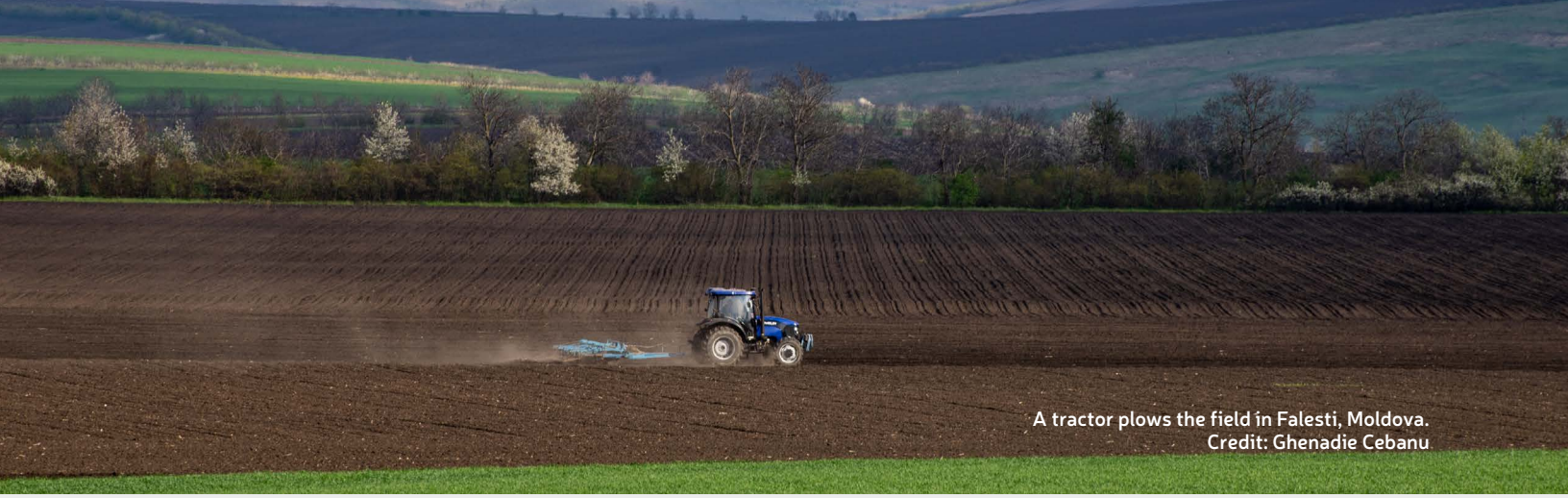
Effective collaboration is fundamental for the modernization of statistical production and for enhancing trust and legitimacy of data and statistics in the food and agriculture sector. When stakeholders along the data value chain collaborate, the result is more and better data produced, more relevant and timely insights for decision-makers, and better use of the available resources, as well as enhanced digitalization.

There is a growing body of evidence, as outlined below, showing how country partners from inside and outside governments are collaborating to share and use data to design food security interventions, provide climate-smart agricultural services to small-holder farmers, and predict the socio-economic and environmental impact of food and agricultural policies.

- In Ghana, where the agricultural sector employs more than half of the country's labor force, the Ghana Statistical Service set up a multi-stakeholder data collaborative, bringing together public and private actors to enable the use of mobile technology and data on weather patterns and crop market prices to provide climate-smart agricultural services to farmers.[16]
- In Tanzania, the Ministry of Agriculture, Livestock and Fisheries and FAO worked together with farmers and the Tanzania Bureau of Statistics to use data to improve the uptake of extension services and livestock vaccination.[17]
- In Kenya at the start of the COVID-19 pandemic, government and non-government stakeholders worked together to find data-driven solutions to enable the Ministry of Agriculture to track the availability of food staples at the subnational level and identify appropriate responses (see Box 4).

However, while advances in digital technology are improving data quality in agriculture and land management systems, they cannot fully replace some of the core building blocks of national data and statistical systems, such

[16] Sarah Burns and Claire Pei, "How Climate-Smart Agricultural Services Can Improve Lives" (GPSDD, 2021). https://www.data4sdgs.org/news/how-climate-smart-agricultural-services-can-improve-lives
[17] Bett, "Agriculture Data."



A tractor plows the field in Falesti, Moldova.
Credit: Ghenadie Cebanu

Box 4: Real time agriculture data for COVID-19 response in Kenya

During the pandemic, Kenya's Ministry of Agriculture set up a Food Security War Room and deployed a mobile-based Food Staples Survey to track the availability of food stocks from stockists, farmers, traders, and other agricultural food operators in the country at the subnational level. The data was used to guide decision-making on food availability and prices, communicate to the public on supplies, distribute relief food to vulnerable communities and support value-chain actors to take advantage of trade opportunities.[18] More importantly it enabled the government to re-think its strategic approach to how data can and should underpin agricultural transformation.

as household surveys or agricultural censuses.[19] This is because the alternative data sources and new methods often require integration with traditional data or validation against these datasets to be useful and usable. For example, traditional survey data can help to ensure that identification of crops and estimates of crop yields using satellite imagery are valid. Box 5 provides some examples of alternative and traditional data sources.

The Africa Regional Data Cube, now known as Digital Earth Africa, piloted the use of Earth observation (EO) data and satellite technology to support Ghana, Kenya, Sierra Leone, Senegal, and Tanzania as they develop policies for agriculture, food security, deforestation, urbanization, and water access. In Senegal, by combining EO data with traditional data on agricultural productivity, the Ministry of Agriculture was able to identify regions that were at high risk for low or no agricultural productivity due to scant, delayed, or no rainfall and, in partnership with FAO, provide climate resistant crops to farmers.[20]

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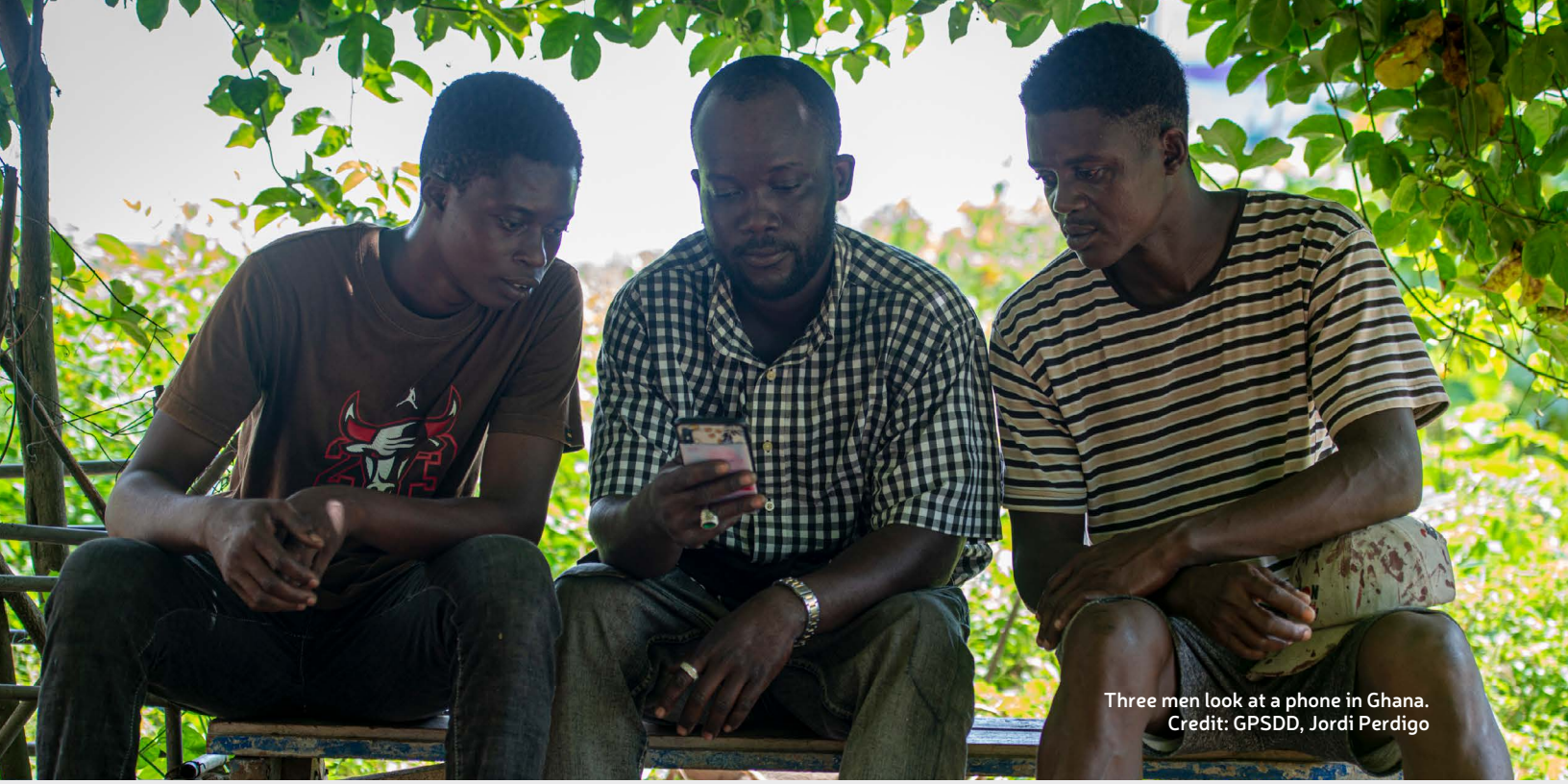
[18] GPSDD, "Real-Time Agriculture Data for COVID-19 Response in Kenya: Lessons to Build the Case for More and Better Financing for Agriculture Data" (2021). https://www.data4sdgs.org/resources/real-time-agriculture-data-covid-19-response-kenya-lessons-build-case-more-and-better

[19] Bern Network, "Financing More and Better Data to Achieve the SDGs" (2019). https://paris21.org/sites/default/files/2019-07/BernDraftReport_SoftCopy_FINAL.pdf

[20] Charu Vijayakumar, "Africa Regional Data Cube: Pilot Use Cases Report: Senegal" (GPSDD, 2020). https://www.data4sdgs.org/resources/africa-regional-data-cube-pilot-use-cases-report-senegal



Three men look at a phone in Ghana.
Credit: GPSDD, Jordi Perdigo

Box 5: Examples of alternative and traditional data sources[21]

Alternative Data Sources	Traditional Data Sources
• Earth observation from satellite imagery • Spatial data infrastructure (road and water networks, geographic information systems) • Citizen-generated data produced through citizen-science initiatives, social media • Official sensor networks (weather, air pollution) • Commercial data (mobile phone records, financial data) • Big data and metadata generated and processed by automated algorithmic processing	• Household and farm surveys • Agricultural censuses • Administrative data (compiled by governmental ministries, departments and agencies) • Civic Registration and Vital Statistics

[21] Steffen Fritz, et al. "Citizen Science and the United Nations Sustainable Development Goals," Nature Sustainability (October 2019). https://www.researchgate.net/publication/336375789_Citizen_science_and_the_United_Nations_Sustainable_Development_Goals

Chapter 4: What are the key challenges for effective collaboration on agri-food systems data?

"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."
—Senior official, Arab League

Stakeholders identified five key challenges as hindering the effectiveness of collaboration on agri-food systems: (1) low political visibility and lack of prioritisation, (2) lack of sustainable investment in data and statistics, (3) weak coordination and political economy challenges, (4) lack of statistical capacity and digital skills to use new technologies, and (5) limited access to new sources of data.

4.1 Low political visibility and lack of prioritization

While most donors provide some financial and technical support on data and statistics, either as bi-lateralor multi-lateral aid or South-South cooperation, very few prioritize this as an area of investment in their overarching cooperation strategy or policy framework. Investing in data and statistics is often seen as a secondary good with a limited direct impact on development outcomes.[22] This combined with the political impetus to demonstrate visibility towards domestic audiences in shorter time frames means that this issue is rarely a priority for the donor community. As a result, there is often no development data focal point within donor organizations and activities are fragmented and spread over different divisions, ministries, or national statistical bodies, creating silos.
Partner country experts recognized that governments may also not realize the value of agricultural or food data or may have limited incentives to invest in data and statistics. This may be the case if the data being produced is not what policymakers want or need for decision-making. One country partner highlighted that in his country most agricultural data and statistics focus on productivity, while there is a demand for more information on food security and food systems. If policymakers are unable to use

[22] OECD (2021), Data for Development Profiles: Official Development Assistance for Data and Statistical Systems, OECD Publishing, Paris, https://doi.org/10.1787/84baa8f3-en.

the data available to answer their questions, they will underestimate the value of data and importance of investing in the area. This points to the need for more dialogue and collaboration between data producers and data users.

4.2 Lack of sustainable investment in data and statistics

Lack of investment in agri-food systems data and statistics was by far the biggest challenge identified by country partners. Many low- and lower-middle-income countries do not have sufficient financial resources for producing agri-food data and statistics, and surveys and censuses are often delayed due to lack of funds. This has profound consequences for the timeliness and usefulness of the data available. Lack of financing is also detrimental to digitization of the sector. While digitization efforts can bring costs down in the medium to long term, upfront investment is required, which many countries cannot afford. This lack of investment also affects the ability to upskill and train public authorities tasked with data collection and analysis.

Nevertheless, the sustainability and long-term financing of digital tools to support the collection and use of data and statistics on agri-food systems must be carefully considered. While collaboration with the private sector can help establish digital and data platforms, their long-term functioning and funding must be assured. Stakeholders from several countries agreed that there is an over reliance on donors for funding and sustaining digital innovation, particularly in Africa, which creates important risks for the resilience of a country's statistical systems. Countries dependent on external funding may tend to prioritize short-term projects that reflect donor priorities, rather than work toward their own long term strategic objectives and institutional development.[23]

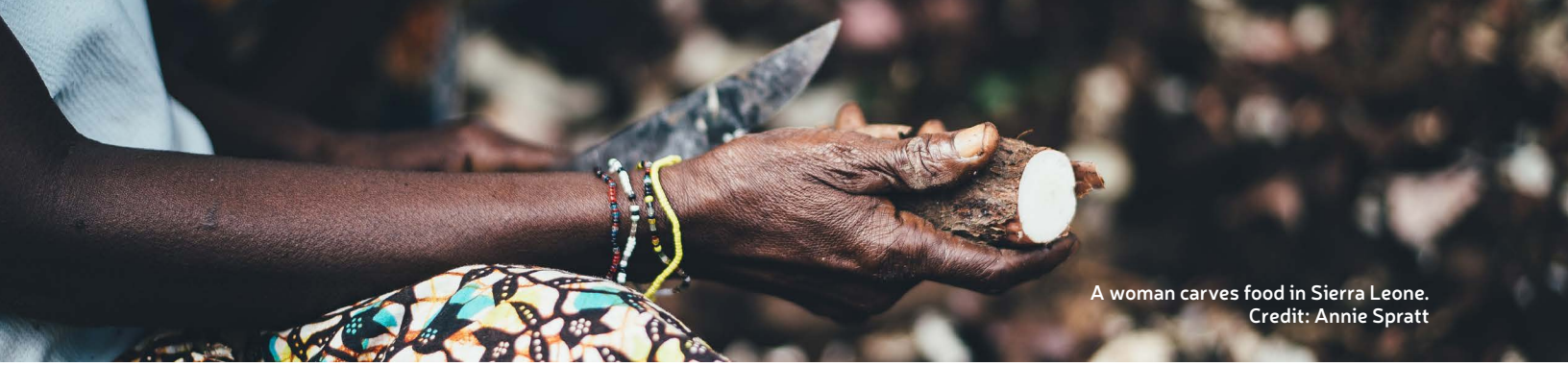
Several experts argued that investments in national data and statistics systems should be financed from domestic resources. Others highlighted the potential role of ODA to catalyze greater investment by showing proof of concept and delivering capacity building support until domestic financing can be scaled-up. The 50x2030 Initiative employs an innovative funding mechanism that leverages both donor and domestic resources to build survey systems that produce foundational agricultural data.

4.3 Weak coordination and political economy challenges

There was consensus among stakeholders that weak or limited coordination on data and statistics for agri-food systems is impacting the effectiveness of collaboration. Among the donor community, this has meant a proliferation of initiatives and data collection activities that risk duplication or may not necessarily align with countries' priorities. Donors acknowledged that these investments often reflect their organization's internal policy priorities and strategic interests and are likely to support their own data needs for planning or results monitoring. As a result, many donors are struggling to understand what others are doing on data and statistics for agri-food systems, both globally and at the country level, to share knowledge and good practice on different approaches and to make strategic choices on their investments.

Country partners agreed that discussions on the use of data and statistics or capacity-building needs are often absent from sectoral dialogues on food and agriculture or from national planning or coordination processes,

[23] Lange, "Key trends."



A woman carves food in Sierra Leone.
Credit: Annie Spratt

or if included, limited to SDG monitoring. Countries may face political-economy challenges. For example, ministries of food and agriculture may be disempowered within national systems, given the pressure for political control on the release of data and statistics by central governments. There may also be disincentives for governments to produce high quality data and statistics if their use could negatively impact on external financing allocations.

4.4 Lack of 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 (i.e., concerning statistical methods and approaches) and upskilling linked to the adoption of new technologies are very much needed. Initiatives which include a capacity building dimension can have a positive impact for data producers and improve collaboration among stakeholders in the agricultural data ecosystem. Initiatives such as GSARS and 50x2030, which produce more cost-effective tools and methodologies for data collection and analysis, play a critical role in this respect.

4.5 Limited access to new sources of data and lack of guidance on good practice

Country partners highlighted that limited access to new and innovative sources of data, such as EO and big data, also constitutes a challenge. Most low- or lower-middle-income countries do not have direct access to these data sources, nor the infrastructure and capacity to store, process, and analyze them. As a result, they rely on intermediaries for accessing and analyzing this information, which can impact on continuity of access, sovereignty, and the sustainability of financing.

From a donor perspective, a lack of guidance on approaches and examples of good practice means that donors that do invest in statistics and data often struggle to understand how to optimize their investments; whether they should, for example, invest in existing systems or survey capacity, or explore opportunities in the development of new tools and technologies such as remote sensing, artificial intelligence (AI) or big data. More guidance is required on how new and traditional data sources should be integrated, for example remote sensing and AI with surveys or the use of real-time data for predictive analytics. Investment decisions on data and statistics need to be "future-proofed" by identifying future digital and data needs and how tools and methods may evolve to address them.

Chapter 5: What are the main enablers for effective collaboration on agri-food systems data?

"Country policymakers are making decisions every day with very inaccurate data and analysis. As donors, we can't expect that to keep happening; the more we empower countries to make good decisions, the better"
–Senior Official USAID

Stakeholders identified four key enablers as supporting the effectiveness of collaboration on agri-food systems: (1) increased domestic demand and country ownership, (2) support for digital transformation, (3) focus on a multi-stakeholder and inclusive approach to data governance and sharing, (4) an understanding of users' needs and the establishment of feedback and dissemination mechanisms.

5.1 Increased domestic demand and country ownership

Donors recognized that they do not have sufficient understanding of national needs, where in-country capacity on data and statistics for agri-food systems requires strengthening or where the integration of new data sources with traditional data can be leveraged to support better decision-making. They also acknowledged that they have a responsibility to support country-led efforts to use data to inform decision-making on agri-food system policies. Strengthening country data systems is a key part of this.

There was consensus among stakeholders that demand for better data and statistics by policymakers in partner countries, as evidenced by the development of a well-defined national strategy on agri-food systems data and statistics can enable actors to align around a common vision, demonstrate country ownership and trigger donor investment. Strong leadership by a national focal point, clarification of the legal mandates and roles and responsibilities of different actors in the data value chain, both within government and in partnership with government are all key enablers for establishing coordination and collaboration mechanisms among stakeholders.

"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 the Kenya Ministry of Agriculture

5.2 Support for digital transformation

All stakeholders recognised digitalization of data collection and production as one of the main enabling factors for collaboration on data and statistics for agri-food systems. The use of CATI methodologies[24] for data collection in agricultural surveys has allowed for faster and better data production. Alternative data sources can fill data gaps and provide new analysis and insights. For example, EO data can provide near real-time insights on productivity or pest control so that farmers can improve crop productivity and their livelihoods.

In the context of COVID-19, countries that are already well-advanced in digitalization efforts did not experience significant delays or challenges in their agri-food statistical activities, as they were able to gather data remotely. However, as several country experts highlighted, to be successful, digitalization efforts in the agri-food sector require the availability of solid digital infrastructures such as internet connectivity, hardware and software for data processing, and investments in IT tools and upgrades. Central governments and international organizations can play a pivotal role in supporting their establishment.

5.3 Focus on a multi-stakeholder and inclusive approach to data governance and sharing

There was consensus among stakeholders that an inclusive and multi-stakeholder approach, bringing together producers and users of data, state and non-state actors, is essential for effective collaboration on data and statistics. Establishing dialogue between stakeholders on how data should be collected, analyzed, and used increases trust and is a precondition for finding good governance solutions for collaboration on data and setting up suitable data sharing infrastructures at the national level.

Non-state actors are both data producers and users and are actively engaged in accelerating the development of innovative approaches and methods. Many companies or industry associations have large volumes of data which could be shared responsibly and used to supplement or validate official data. Civil society organizations can play a key role in ensuring that everyone is counted–– women, girls, ethnic minorities, socio-economically disadvantaged and other vulnerable populations––including via the production and use of citizen-generated data.[25]

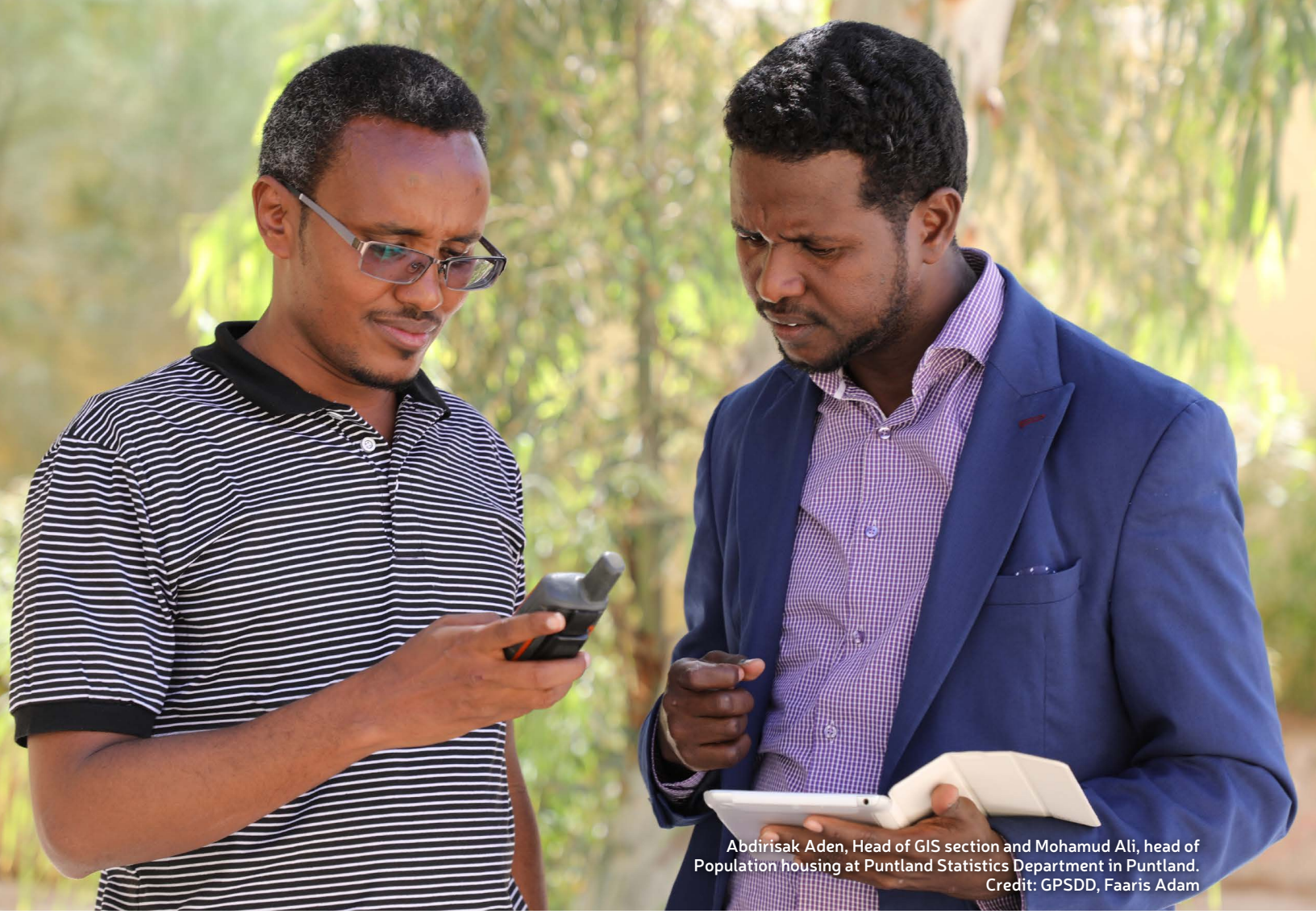
Increased digitization also risks widening the digital divide, as low income, digital literacy, or lack of access to technology can impact people's ability to access digital services and underscores the importance of ensuring the inclusion of small-scale producers and vulnerable groups in decision-making on the production and use of data and statistics both globally and at country level.

5.4 An understanding of users' needs and the establishment of feedback and dissemination mechanisms

"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 non-profit organization operating in the agri-food sector

[24] Computer Assisted Telephone Interviewing
[25] Karina Cázarez-Grageda et al. "Re-using citizen-generated data for official reporting" (PARIS21, 2020)



Abdirisak Aden, Head of GIS section and Mohamud Ali, head of Population housing at Puntland Statistics Department in Puntland. Credit: GPSDD, Faaris Adam

Identifying all data users and their needs is crucial for producing useful statistics. Mechanisms need to be established between the relevant government agency and users of agri-food data, including research institutes, farmers organizations, and civil society. Doing so can help ensure that the data being provided meets users' needs along the entire statistical production value chain, from data collection to dissemination. Ensuring data is made available to non-governmental stakeholders, including the private sector, can help ensure uptake and contribute to strengthening data quality through feedback loops.

Data collected at the country level should also inform global analysis, and its value should be more clearly articulated as part of global policy debates. Donors are both producers and users of data and a major incentive for them to increase investment in this area is the use of national data for better analysis to understand where needs are greatest to support a more effective allocation of resources and to track progress. Indeed, recognizing that supply-side efforts focused on data production alone are unlikely to increase evidence use in decision-making, 50x2030 has a workstream dedicated to promoting the use of data and evidence generated under the Initiative to inform decisions that will spur agricultural growth.

Chapter 6: What is the role of the FAO on data and statistics for agri-food systems?

The FAO is custodian for 21 of the SDG indicators; data and statistics on food and agriculture lie at the heart of its mandate and strategic goals as a provider of global public goods in this area for the international community. Its statistical functions cover four main areas: (1) data collection, processing analysis, and dissemination; (2) the development of methods and standards; (3) statistical capacity development; and (4) statistical coordination and governance.[26]

Since 2009, the FAO has undergone a process of internal and external reforms to improve the harmonization, coordination, and quality of data and statistics (see Box 7). The organization is taking steps to modernize its approach to the collection and use of data and statistics by supporting countries in the use of new and alternative data sources, placing digital transformation at the top of its agenda and identifying data as an accelerator for reform in its next 10-year Strategic Framework.

There is an opportunity for the FAO to strengthen its role in supporting more effective collaboration on data and statistics for agri-food systems. However, stakeholders recognize that the organization is facing several challenges hindering progress. These include: (1) inadequate financing for data and statistics activities, (2) limited support for national priorities and capacity-building, (3) the need to modernize and future-proof the organizational approach to data and statistics, and (4) the need to strengthen collaboration and strategic partnerships on data and statistics.

6.1 Inadequate financing for data and statistics activities

Financing for the FAO's agricultural data and statistics activities is currently inadequate. The organization's internal statistical governance and functions regarding the collection, curation, and dissemination of the FAO data, carried out by the Office of the Chief Statistician, the Statistical Division, and some statistical units located in technical divisions are considered to be part of its core budget and financed by its regular program of work. With zero nominal growth since the previous biennium, the FAO's budget has effectively been cut. As a result, most of the FAO's non-core activities for data and statistics, such as technical and capacity-building support to

[26] FAO, FAO Statistical Programme of Work, 2020-2021 (Rome, 2020). http://www.fao.org/3/ca9734en/CA9734EN.pdf

Box 6: Statistics at the FAO

Since 2014, the FAO has been implementing a statistical quality assurance framework that has improved the quality of corporate statistical processes. In 2016 it established the Office of the Chief Statistician, with responsibility for providing strategic vision for the work of FAO in statistics. Major efforts have been made to improve corporate data dissemination policies and platforms, including new open data and microdata dissemination policies. The FAO is highly regarded by the United Nations Statistical Commission for the role it plays in developing methodology for the SDG indicators under its custodianship. This was reflected by its contribution to the "Voices of the Hungry" which has improved the availability of reliable food and nutrition security statistics around the world.

countries, methodological work to support digital transformation, and innovative data approaches, are financed outside the regular budget and are dependent on the mobilization of additional voluntary resources.

The FAO relies on a handful of donors committed to investing in agricultural data and statistics to provide external funding from voluntary contributions.[27] This has an impact on the predictability and sustainability of FAO's work on data and statistics. Decreases in voluntary contributions by bilateral donors owing to the impact of COVID-19 on ODA will only exacerbate this situation.

6.2 Limited support for national priorities and capacity-building

The FAO is required to produce high quality statistics and analysis to support global SDG implementation efforts and the transformation of agricultural and food systems through the efficient and sustainable management of natural resources. FAO statistics rely mainly on official data from its members so weak in-country coordination and statistical capacity impacts data quality. In addition, budget constraints (both assessed and voluntary contributions) have reduced the FAO's capacity to implement a more comprehensive and long-term strategy to support national institutions build their statistical capacities and systems that would produce better quality data and statistics over time. A lack of core funding and a subsequent dependency on external project funding for statistical capacity-building has meant that activities have not always been systematic, well-coordinated or sustainable.[28] This approach may have also weakened the levels of trust and collaboration between partner country members and the organization.

There was broad consensus among stakeholders that the FAO should play a more proactive role in strengthening countries'

[27] FAO, Resources Partnerships Impact 2019 (Rome, 2019). http://www.fao.org/3/ca4851en/CA4851EN.pdf
[28] FAO, Evaluation of FAO's Statistical Work, Thematic Evaluation Series (Rome, 2020). http://www.fao.org/3/ca9461en/CA9461EN.pdf

capacities for generating agricultural data and statistics in accordance with national priorities and for supporting country-led efforts to use data to drive more effective decision-making at the country level.

6.3 The need to modernize and future-proof the organizational approach to data and statistics

The international statistical community has recognized the need to strengthen national ownership of the production, dissemination, and use of data for sustainable development alongside a process of modernization that facilitates the application of new technologies and new data sources to mainstream statistical activities.[29]

The FAO is taking steps to integrate this approach into its program of work on data and statistics. The organization has developed a new strategy for the modernization of statistics for 2020-2025, which was presented at the UN's Statistical Commission in March 2020. The strategy aims to support countries in the use of new/alternative data sources and establish a Data Innovation Lab for the development of new methods of data integration. The lab will provide the data for the Hand-in-Hand Initiative, which has a GIS data-platform to match external investment with national needs, with a focus on countries with the highest levels of poverty and hunger. Few of the donors interviewed were aware of the FAO's statistical modernization strategy.

6.4 The need to strengthen collaboration and strategic partnerships on data and statistics

Some donor organizations expressed concerns that multilaterals in general (and including the FAO) are not responding to the realities of decreasing aid budgets. Multilateral organizations will need to get better at targeting their capacity and resources where it is needed most, identifying their respective added value, and working together in partnership, rather than competing for funds. The overall reform of the UN development system, which aims to improve country-level coordination, supported by the appointment of a single, independent Resident Coordinator for all UN agencies is reinforcing this trajectory.

While data demands are great and increasing, several donors interviewed highlighted that capacity in this area does not need to reside solely with one agency. They would welcome FAO playing a stronger role in convening and facilitating partnerships on agri-food data and statistics at global and country levels and as part of a collaborative, multi-stakeholder approach. Collaboration on data is a key driver for digital transformation and innovation. This approach will become increasingly important for supporting the capacity of national statistical systems to leverage the use of alternative data sources and digital technology.[30]

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[29] High-level Group for Partnership, Coordination and Capacity-Building for Statistics for the 2030 Agenda for Sustainable Development, Cape Town Global Action Plan for Sustainable Development Data (UN Statistics Division, 2017). https://unstats.un.org/sdgs/hlg/cape-town-global-action-plan

[30] Jenny Oldfield, "Five Ways Data Is Bolstering African Countries' Resilience to the Pandemic and Other Global Shocks" (GPSDD, April 1, 2021). https://www.data4sdgs.org/index.php/news/five-ways-data-bolstering-african-countries-resilience-pandemic-and-other-global-shocks

Chapter 7: How to strengthen FAO's role on data and statistics for agri-food systems?

Stakeholders identified three areas of opportunity which could enable the FAO to strengthen its role on agricultural data and statistics: (1) provide thought leadership on the use of innovative sources of data, (2) articulate a vision for digital transformation within the sector, and (3) broker inclusive partnerships on data and statistics.

7.1 Provide thought leadership on the use of innovative sources of data

Stakeholders acknowledged the opportunities that advances in innovation and digital technology are providing, for example around big data and geo-location, which can improve data quality in agriculture and land management systems. Organizations are keen to understand where data gaps are, how these could be potentially filled with new sources of data alongside official statistics, and how better collection and use of data can lead to impact in international cooperation and in implementation of the SDGs.

The FAO is already making a significant contribution on the use of innovative sources of data. However, a more integrated and strategic approach, working in partnership with other stakeholders to identify and explore new sources and methods, demonstrate impact, share knowledge with members, and respond to concerns around issues of data access, ownership and privacy would enable the organization to play a more visible and stronger thought leadership role in the sector.

7.2 Articulate a vision for digital transformation in the sector

The effectiveness of digital technologies and digital transformation strongly depends on data and data technologies. Governments and international organizations have a responsibility to ensure that they have a clear data strategy and predictable legal frameworks that can spur innovation (especially for purposes in the public interest), mitigate risks, and earn people's trust.

The FAO's Director General has put digital transformation on the top of the organization's agenda and has identified data as an accelerator for reform. Many providers viewed the Hand-in-Hand Initiative as a step in the right direction. FAO's data strategy

A woman farmer near Nepalgunj in Western Nepal.
Credit: Robert Stansfield/DFID

process, statistical modernization efforts, and the International Platform for Digital Food and Agriculture are opportunities for the organization to articulate its vision for improving the production, analysis, and use of data and statistics as part of the new Strategic Framework, Medium-Term Plan and Programme of Work and Budget and how, looking to the future, it sees its role evolving.

7.3 Broker inclusive partnerships on data and statistics

The Food Systems Summit is an opportunity to kickstart a major shift in approach which places effective data systems, statistical capacity, and digital skills at the heart of agri-food systems transformation. There is an opportunity for the FAO to play a more convening, facilitating, and standard-setting role by working in partnership with other stakeholders to support this process.

Conclusions and recommendations

The COVID-19 pandemic and its socio-economic implications have intensified the urgency of not only scaling up financing for data and statistics at both the country and global levels, but also ensuring that financing is spent more efficiently and effectively.

Stakeholders are keen to understand where data gaps are, how these could be potentially filled with innovative sources of data, and how better collection and use of data can support the implementation of the SDGs and lead to better development outcomes. Current financing models are inadequate and there is a need to explore options for a new approach to financing data and statistics in the agri-food sector that supports country leadership, fosters greater alignment with country priorities and drives coordination among donors.

Effective collaboration on data by stakeholders is fundamental for the modernization of statistical production and enhancing trust and legitimacy of data and statistics in the food and agriculture sector. However, support to date has faced challenges surrounding prioritization, coordination, country ownership, and sustainability, which have limited its effectiveness.

The 42nd Session of the FAO Conference, 2021 Food Systems Summit, the G20, and the Committee for World Food Security's HLPE Report on Data collection and analysis tools for food security and nutrition are key opportunities for the international community to scale up investment and improve the effectiveness of collaboration on data and statistics for agri-food systems. This requires action in several key areas:

1. **Governments and donors should scale up and improve the effectiveness of investments in data and statistics for agri-food systems.**

- Raise awareness among senior decision-makers within their organizations at the national and global levels on the value of data and the benefits of investing in robust national data and statistics systems.
- Prioritize and/or integrate agri-food data and statistics within cooperation strategies, sectoral dialogues on agriculture and food systems, national planning processes, and global forums.
- Support the development of national data systems, statistical capacity, and digital skills that enable countries to meet and monitor the SDGs.
- Accelerate action to support FAO's digital transformation by ensuring more predictable and sustainable investment and support for its data and statistics activities.

2. **Governments should improve collaboration on data and statistics for agri-food systems at national and subnational levels.**

- Invest domestic resources in the digitalization of data collection and production activities.
- Develop national data strategies for collaboration on agri-food system data, including guidelines for data sharing and use, legal mandates, and the roles and responsibilities of different actors in the data value chain, including donors and international organizations.
- Adopt an inclusive and multi-stakeholder approach that strengthens data governance and sharing, and establish mechanisms for feedback on data quality and dissemination.
- Explore mechanisms that ensure that information produced on agri-food systems meets users' needs by connecting data producers with academia, policymakers, service providers, affected communities, and other data users.
- Ensure the sustainability and long-term financing of digital and data platforms.

3. **The FAO should improve the visibility and effectiveness of its data and statistical work and country-level support.**

- Develop a clear vision and integrated data strategy on innovation and digital transformation, supported by a framework for strategic oversight and data governance.
- Foster an environment that helps countries strengthen statistical capacity and digital skills, national coordination, and governance on data collection and use across institutions.
- Provide guidance and thought leadership to the international community on how new and traditional data sources should be integrated and "future-proofed" to identify prospective digital and data needs and how tools and methods may evolve to address them.
- Advocate for and articulate the value of country-level data for informing global analysis, and demonstrate and communicate how stakeholders' use of agri-food systems data is supporting data-driven decision-making and contributing to better outcomes.
- Promote the establishment of a formal platform or mechanism for international organizations, particularly Rome-based agencies, to regularly interact with members on agri-food data and statistics issues.

4. **Donors should take steps to improve coordination on data and statistics for agri-food systems.**

- Support the alignment of data collection and capacity strengthening activities with countries' priorities.
- Establish a community of practice to share stories of impact to build the case for supporting data and statistical systems as a strategic investment to drive food systems transformation.
- Explore options for improving donor harmonization on results-monitoring frameworks to avoid duplication and facilitate coordination around support to countries' foundational data systems.

5. **Non-governmental stakeholders should improve collaboration on data and statistics for agri-food systems.**

- Support national priorities and country-led efforts to use data to inform decision-making on agri-food system policies.

- Explore opportunities to collaborate with state actors on supplementing and validating official data sources.
- Share good practice on responsible data sharing and use at national and international levels.
- Strengthen and scale up support for statistical capacity building and digital skills to use new data sources.
- Facilitate access to new and alternative sources of data.

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This is an independent report. The analysis presented and views expressed within it are the responsibility of the Global Partnership and do not necessarily reflect those of the contributors or their organizations.

Annex 1: Indicative examples of available data and statistics for agri-food systems

Theme	Traditional data collection mechanisms	Examples of alternative data collection mechanisms
Monitor the food insecurity of vulnerable populations	Surveys (large scale surveys/household surveys/targeted surveys)[31]	*Geospatial Information Systems (GIS) - Remote sensing* The AfriCultuRes project provides an integrated agricultural monitoring and early warning system based on remote sensing data to support improved decision making on food security for eight countries in Africa.
Track food stocks & food prices	Surveys (cost of cultivation surveys/ business surveys / market surveys / consumer price indexes)[32]	*Crowdsourcing & citizen generated data* The Food Price Crowdsourcing Africa tool collected real time price data during the COVID-19 pandemic in North Nigeria based on citizen generated data.
Monitor agricultural trade /shipping	Customs statistics[33] / administrative data	*Sensors Data – GIS data* Port calls and trade volume dashboards can be generated based on ships' Automated Identification Systems (AIS) which are a signaling (sensor) system for vessels to share information about their location, speed, status etc.[34]

[31] Examples include the Food Insecurity Experience Scale survey module (FIES-SM) or the 50x2030 survey instruments.
[32] Methodologies for calculating grain stock surveys are examples of traditional data collection mechanisms.
[33] Agricultural trade statistics are mainly based on the International Merchandise Trade Statistics (IMTS) Methodology which leverages data from customs offices and economic operators.
[34] For more details on the AIS data, see the UN Statistics Wiki AIS Handbook.

Track agricultural production (crops, livestock, fisheries, forestry) and incomes of small-scale food producers	Agricultural surveys / farm and agricultural censuses[35]	*Web scraping & Earth Observation (satellite and in situ measurements)* The FAO's Data Lab produces agricultural production statistics based on web scraping techniques. The FAO has carried out a joint initiative on EO-assisted crop monitoring for the generation of official statistics in developing countries, such as Senegal and Uganda, through satellite data and in situ measurements.
Track agricultural labour	Farm surveys / Labour surveys / Agricultural censuses[36]	Citizen generated data Companies like Esoko have developed crowdsourced/farmer-based data collection methods which can be used to gather data directly from farmers on different areas (i.e. employment, market prices).
Monitor environmental impacts (soil, water, fertiliser and pesticide pollution, biodiversity)	Land surveys / soil and water sampling / farm surveys / household surveys[37]	*Earth observation (Satellite data) and crowdsourcing* The Africa Regional Data Cube (ARDC)/ Digital Earth Africa currently supports five countries in accessing EOs data for environmental monitoring. Crowdsourcing techniques can be used to gather information on pests and diseases directly from farmers.[38]
Understand Nutritional status	Surveys (household and ad hoc surveys)[39]	Web scraping Web scraping techniques are currently used to extract information on nutrition and availability of products from supermarkets' websites.[40]

[35] See the 50x2030 survey instruments
[36] More details on methodology for calculating labour statistics can be found on ILO's website.
[37] See the 50x2030 survey instruments as a reference
[38] See Crowdsourcing for agricultural applications : a review of uses and opportunities for a farmsourcing approach, 2017, https://orbi.uliege.be/bitstream/2268/215253/1/Minet_COMPAG_2017_postprint.pdf
[39] See the 50x2030 survey instruments as a reference
[40] See for instance Nutrient composition databases in the age of big data: foodDB, a comprehensive, real-time database infrastructure, 2019, https://pubmed.ncbi.nlm.nih.gov/31253615

Annex 2:
List of participating organizations

1.	The Arab League
2.	Bangladesh - Permanent Representation to the FAO
3.	Belgium - Ministry of Foreign Affairs
4.	Canada - Global Affairs Canada (GAC)
5.	Capo Verde - Permanent Representation to the FAO
6.	Colombia - National Administrative Department of Statistics (DANE)
7.	The Bill and Melinda Gates Foundation (BMGF)
8.	Development Gateway
9.	Digital Agriculture Association
10.	Egypt Permanent Representation to the FAO
11.	European Commission
12.	Food and Agriculture Organization (FAO)
13.	Germany - Ministry of Foreign Affairs
14.	Ghana - Permanent Representation to the FAO
15.	Ghana - ESOKO
16.	Ghana - Ministry of Food and Agriculture
17.	Ghana Statistical Service (GSS)
18.	India - Permanent Representation to the FAO
19.	Indonesia - Permanent Representation to the FAO
20.	Kenya - Permanent Representation to the FAO
21.	Kenya Ministry of Agriculture

22.	Mercycorps
23.	Namibia Statistics Agency (NSA)
24.	The Netherlands - Ministry of Foreign Affairs
25.	New Zealand - Ministry of Foreign Affairs
26.	Nigeria - Permanent Representation to the FAO
27.	Private Sector Mechanism of the Committee on World Food Security
28.	Puntland State of Somalia - National Bureau of Statistics
29.	Sénégal - Permanent Representation to the FAO
30.	Sénégal - Feed the Future Senegal Policy Systems Services
31.	Sénégal - Initiative Prospective Agricole et Rurale (IPAR)
32.	Sénégal - Ministry of Agriculture
33.	Sierra Leone - Ministry of Agriculture and Forestry
34.	Switzerland - Swiss Agency for Development Cooperation (SDC)
35.	Tanzania - National Bureau of Statistics
36.	Thailand - Permanent Representation to the FAO
37.	Togo - Ministry of Environment
38.	United Kingdom – Foreign, Commonwealth and Development Office (FCDO)
39.	Uganda - Ministry of Agriculture
40.	United States - USAID
41.	World Bank
42.	Zanzibar - Ministry of Agriculture