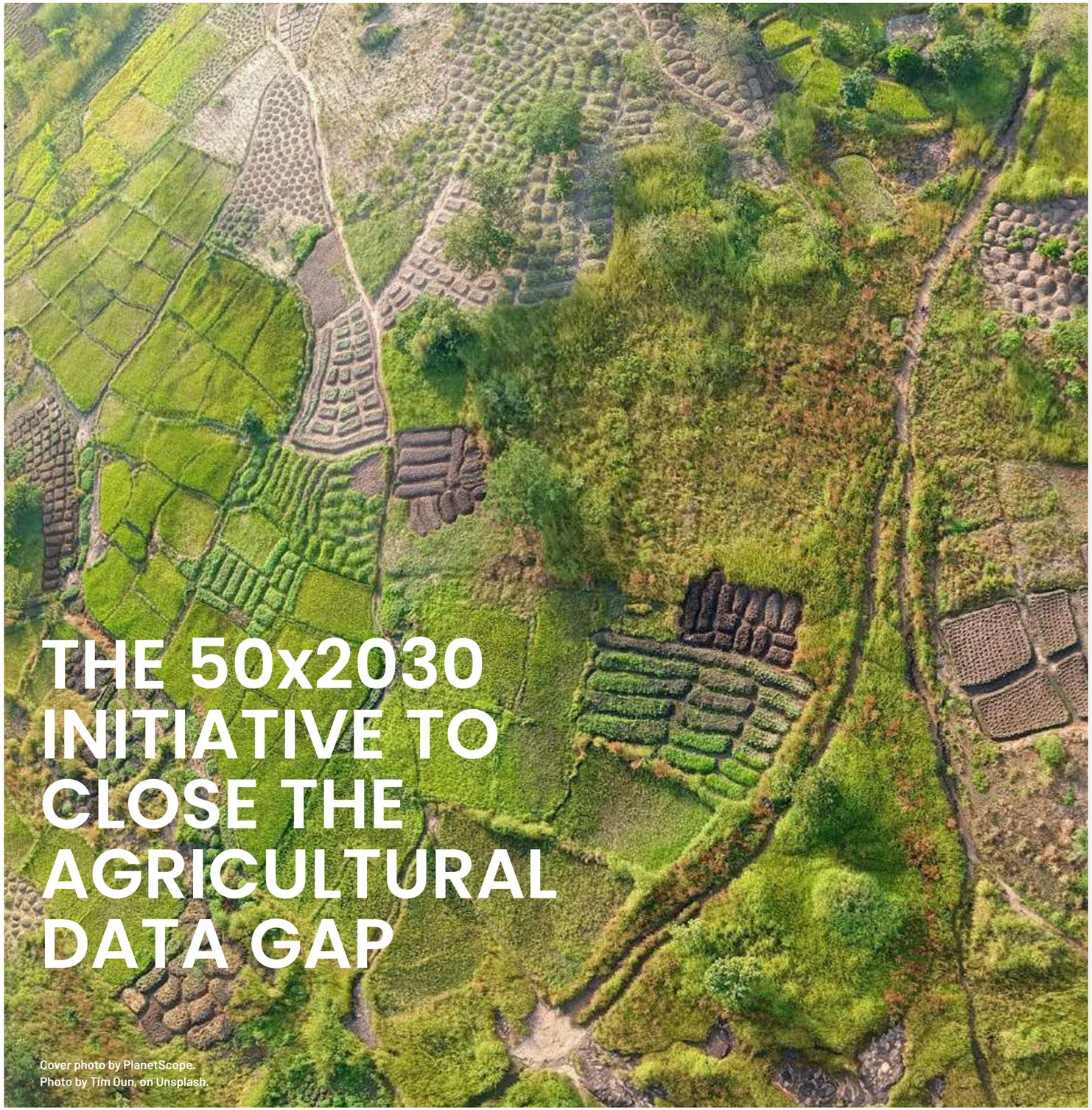
50x2030 ANNUAL REPORT

FY22 JULY 1, 2021 TO JUNE 30, 2022



THE 50x2030 INITIATIVE TO CLOSE THE AGRICULTURAL DATA GAP

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MESSAGE FROM THE PROGRAM MANAGEMENT TEAM

Good statistics are at the core of successful development strategies. The etymology of the word 'statistics' is akin to that of the 'state' and the two concepts are deeply intertwined. The state-building process that historically accompanied development has required countries to develop the capacity to count their own people and quantify the size of their economies. Indeed, state-building is a key component of the development process, and this ultimately depends on good statistics.

The COVID-19 pandemic and the global food crisis have further highlighted the importance of data and statistics. This is especially true in developing countries, many of which have been severely affected. There is much interest in the use of data — particularly agricultural data — to measure the severity of the shocks, the impact on countries and their capacity to respond. Agricultural data can help monitor the impact of crises in many of these countries, providing governments with reliable information on which to base policies for building resilience to shocks and strengthening food security.

The 50x2030 Initiative to Close the Agricultural Data Gap plays a key role in supporting low and lower-middle income countries (LLMICs) to improve their capacity to produce high quality agricultural data and make adequate use of it. Since its inception, 50x2030 has worked hard to promote evidence-based policy making as central to any conversation on development.

In FY22, the Program Management Team (PMT) of 50x2030 has undergone reorganization, with a new Program Manager appointed, and new staff joining. The change allowed the PMT to push forward in operationalizing the ambitions set forth by the Initiative. The PMT, with the strategic guidance of the Partnership Council (PC), focused on aggressive partnership with the World Bank Global Practices to secure International Development Association (IDA) resources in support of partner countries' survey programs. This resulted in an estimated USD 182 million in potential IDA funding for data operations in 30 partner countries. These promising results further motivated the PMT to expand country engagement to meet the Initiative's goal of bridging the global agricultural data gap by transforming data systems in 50 countries from sub-Saharan Africa, East Asia Pacific and South Asia, and Latin America and the Caribbean, by 2030.

Even during the pandemic, the 50x2030 Initiative implemented integrated and enhanced agricultural surveys and conducted capacity building activities to ensure greater use of this data for evidence-based decisions and policies in ten countries. As countries slowly eased their COVID-19 restrictions, the Initiative adopted a hybrid approach to supporting them, combining remote assistance with in-country missions. The Initiative continued to adjust its modalities to country needs and specificities. The urgent need for accurate and timely agricultural data to inform countries' recovery and rehabilitation efforts following the pandemic, and manage the food security crisis resulting from the war in Ukraine, gave the Initiative impetus to accelerate its support.

Thus, data production activities such as data collection, processing, tabulation, and dissemination have significantly advanced in partner countries. This resulted in the estimation of key SDG indicators on labor productivity (2.3.1) and income of small-scale food producers (2.3.2). It also resulted in the estimation of national indicators used to monitor development targets and report on country commitments, such as those of the Comprehensive Africa Agriculture Development Programme (CAADP).

Capacity building interventions were also identified, particularly the kinds of training and technical assistance needed to ensure wider use of the 50x2030 data by ministries of agriculture and other major users of agriculture data. A round of data use workshops were organized by the Initiative to define these needs. In a bid to showcase the value of using 50x2030 data in policymaking, the Initiative successfully convened its first fully-virtual 50x2030 Global Data Use Conference. It featured 26 sessions with a total of 16 hours of streamed content and 824 registered participants representing 100 countries and 384 institutions. Several policy research papers from the 50x2030 Research Grant Competition were presented in the Conference.

Also in FY22, the Initiative produced global public goods aimed at developing new and/or upgrading existing tools, methodologies, and guidelines that will help countries in implementing high quality surveys. Open-access research papers and technical notes for country teams were developed and published, illuminating areas and approaches for improving agricultural surveys and the resulting data. Ongoing methodological studies and analysis advanced throughout the period in multiple areas central to 50x2030 objectives, such as the integration of satellite and survey data, soil health, and measurement of high-resolution climate and weather data, which will feed into further guidance tools and publications in the coming year.

The Initiative's three-year start-up period has been challenging. But it has also been exciting and rewarding, enabling the Initiative to lay the foundations for the years ahead. The statistics and analytics produced by partner countries are at the heart of the answers to both emerging and entrenched challenges — from post-pandemic recovery to food insecurity, climate change and inequality — and 50x2030 is now well equipped to support these efforts. As the Initiative continues to navigate the ever-changing global and national landscapes, it will be ready and energized to rapidly scale up support to countries through deeper and expansive engagement with all partners, rigorous development of global public goods, and accelerated implementation of country activities. It is committed to bolstering partner countries' capacity to strengthen their agricultural data systems. This is the promise that the Initiative intends to deliver moving forward.

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50x2030 IN NUMBERS

MILESTONES AS OF JUNE 2022

5
Partner countries with government co-financing

7
Countries with SDG indicators produced

20
Agricultural surveys conducted

- Armenia: 1
- Cambodia: 4
- Georgia: 3
- Ethiopia: 1
- Malawi: 1
- Nepal: 2
- Senegal: 4
- Uganda: 4

9
Countries with 50x2030 Initiative agriculture data sets produced

8
Countries integrating an alternative data source

9,278
Datasets downloaded for all 6 countries

53
trainings organized or conducted in 8 countries

98
individuals trained

CURRENTLY ACTIVE COUNTRIES:

- Armenia
- Cambodia
- Ethiopia
- Georgia
- Malawi
- Nepal
- Nigeria
- Senegal
- Uganda

COUNTRIES IN ONBOARDING PHASE:

- Angola
- Benin
- Burkina Faso
- Cabo Verde
- Cote d'Ivoire
- Ghana
- Kenya
- Indonesia
- Liberia
- Mali
- Sierra Leone
- Tanzania
- Togo

TOTAL OF 3 SDG INDICATORS PRODUCED:

SDG 2.3.1 Volume of production per labour unit by classes of farming/pastoral/forestry enterprise size.

SDG 2.3.2 Average income of small-scale Producers.

SDG 5.a.1 Women's and men's land rights.

Data collected to support the compilation of 8 Comprehensive Africa Agriculture Development Programme (CAADP) indicators

- **31.I** Senegal
- **3.1II** Senegal, Uganda, Nigeria, Ethiopia, Malawi
- **3.1IV** Uganda, Nigeria, Ethiopia, Malawi
- **3.1VI** Uganda, Nigeria, Ethiopia, Malawi
- **3.2I** Senegal
- **3.2II** Senegal, Uganda, Nigeria, Ethiopia, Malawi
- **3.2III** Senegal, Uganda
- **4.1I** Senegal, Uganda

More than

9,400

unique visitors on 50x2030 website since inception of the programme

TOOLS & PUBLICATIONS:

16 Papers published

7 Technical notes and guidance documents published

2 Geospatial products published

16 Survey instruments published

9 Additional papers under development

5 Additional Technical notes under development

THE YEAR IN NUMBERS

182M USD
in IDA funding specified for 50x2030:

7
WB IDA projects

31
IDA countries targeted

5
Surveys conducted in 5 countries:

- **SENEGAL:** EAA 2021/22
- **GEORGIA:** GSAH 21
- **CAMBODIA:** CAS2021
- **ETHIOPIA:** ESS5
- **NEPAL:** CLIS 20-21

824
participants to Global Data Use Conference

Official Poster of the Global Data Use Conference featuring the Vice Prime-Minister of Georgia, H.E. Levan Davitashvili, who spoke during the opening session on 30 November 2021.

50x2030.org WEBSITE

1,211
unique visitors on 50x2030 website in FY22

3,507
file downloads on 50x2030 website in FY22

13
Papers published

2
Technical Notes published

FY2021–2022

PROGRAM OPERATIONS

OVERVIEW OF COUNTRY ENGAGEMENT

In FY22, the Program Management Team focused on engaging with new countries identified to have confirmed IDA and/or country funding. The onboarding process commenced in 11 countries[1], where a series of inception meetings and technical discussions were initiated. The majority of these countries have allocated budget for agriculture survey data collection activities under World Bank IDA regional and/or country statistics projects[2]. Various activities, mainly those relating to data production and a few on data use, were implemented in eight countries in FY22. Details of the activities in the partner countries are reflected in Section Updates on Country Work. It is important to note that some of the planned country engagement and implementation of activities for the period did not take place due to funding constraints and the need to prioritize countries with confirmed funding from IDA projects.

1 Pre-onboarding processes (e.g., inception meeting, roadmap preparation, IDA discussions, technical discussion on data production and data use, etc.) were launched for the following 11 countries during the reporting period: Angola, Benin, Burkina Faso, Cabo Verde, Côte d'Ivoire, Ghana, Indonesia, Kenya, Liberia, Sierra Leone and Tanzania.

2 World Bank Statistics Projects with budget allocation for the 50x2030 Initiative include the Harmonizing and Improving Statistics in West Africa (HISWA) and Central Africa (HISWACA), the East Africa Regional Statistics Program for Results, and The Angola Strengthening Statistical Capacity Project.

UPDATES ON COUNTRY WORK

The Initiative, through its Data Production and Data Use components, implemented a range of activities in partner countries during the reporting period, including survey operations (data collection, preparatory work, data processing and tabulation), capacity building (training, workshop), and data use assessment. Highlights of the activities undertaken by implementing partners are summarized by country in this section.

The road to Tatev Monastery, Armenia, photo by Armine Grigoryan / World Bank.

Armenia

- **SURVEY OPERATION:**
  AGRIS Core and Economy pilot modules data processing and tabulation finalized
- **DATA DISSEMINATION:**
  Results of AGRIS survey of agricultural holdings 2020 uploaded to the ARMSTAT Microdata Catalogue; final workshop presented the results from the four provinces (marzes) where the Ministry of Economy underlined the importance of this data for the proper formulation and evaluation of national agricultural policy
- **CAPACITY BUILDING:**
  Training delivered on data tabulation; DDI-training workshop

COUNTRY FEEDBACK: ARMENIA

ARMSTAT headquarters and province representatives expressed their great satisfaction with the new system of agricultural statistics surveys. They also expressed a willingness to continue the renovation of the agricultural statistics in Armenia through the 50x2030 Initiative.

Cambodia

- **SURVEY OPERATION:**
  Cambodia Agriculture Survey 2021 (CAS 2021) with Income, Labor and Productivity module completed
  - over 116,000 households screened, and over 17,000 household and juridical holdings interviewed
  - data collected to inform SDG Indicators 2.3.1 and 2.3.2, and economic sub-indicators of 2.4.1
- **DATA DISSEMINATION:**
  CAS 2020 final report published; aggregated tables on the CAMSTAT platform released (CAS 2020 microdata to be released by the end of 2022)
- **CAPACITY BUILDING:**
  adaptive solutions to build national capacity such as remote and on-the-job training sessions were implemented to address delays in the survey program due to COVID-19; data use community for users of agricultural and rural data is being pilot-tested
- **DATA USE ASSESSMENT:**
  report produced
- **PROGRAM PLANNING:**
  planning workshop conducted to identify data use activities including training to develop capacity to use agricultural data in Cambodia and creation of a Data Use Community
- **RESEARCH GRANT:**
  three Cambodian researchers were awarded grants for practical research applied to national policy making, program design or investment decisions
  - eight research proposals from Cambodia were received for the 2022 Research Grant Competition
  - research findings were presented at the 2021 Global Data Use Conference

Photo by Chor Sokunthea / World Bank.

Photo by Dramane Bako / ©FAO.

Ethiopia

- **SURVEY OPERATION:**
  ESS5 implemented at scale and expanded to include the urban agriculture module; the Agricultural Sample Survey (AgSS) 2021/22 and the Commercial Farm Survey (CFS) 2021/22 were conducted
  - survey instruments for AgSS (2022/23) round were reviewed to ensure that data related to costs, labor productivity (SDG 2.3.1) and farm income (SDG 2.3.2) is properly collected, while ESS5 instruments covered SDG 5.a.1.
  - preparation of survey instruments and refinement of survey methodologies commenced in relation to large pilot surveys of nomadic and transhumant livestock, and urban agriculture
- **DATA DISSEMINATION:**
  key findings of the AgSS 2021/22 and the CFS 2021/22 released
- **CAPACITY BUILDING:**
  theoretical and practical training conducted for the Ethiopian Statistics Service (ESS) staff to measure costs of agricultural production and to work on a standalone report
- **DATA USE ASSESSMENT:**
  the online survey was relaunched; interviews with key informants are ongoing
- **RESEARCH GRANT:**
  three Ethiopian researchers were awarded grants for practical research applied to national policy making, program design or investment decisions
  - twenty-four research proposals from Ethiopia were received for the 2022 Research Grant Competition
  - research findings were presented at the 2021 Global Data Use Conference

Georgia

- **SURVEY OPERATION:**
  Regular quarterly data collection implemented for the Survey of Agricultural Holdings (GSAH) for reference years 2020 and 2021, with a focus on improving the statistical infrastructure, data cleaning and validation processes, and dissemination; the preparation and implementation of the Production Methods and Environment (PME) rotating module were successfully carried out, including the development and testing of the questionnaire and the data collection of PME 2021
  - cleaning of the merged datasets from the GSAH and the PME module that would allow the calculation of SDG indicator 2.4.1 is ongoing

- **DATA DISSEMINATION:**
  SDG Indicators 2.3.1 and 2.3.2 were calculated and published; the dissemination policy was reinforced by the sharing of new annual indicators, such as those on labor force and farm expenditures

- **CAPACITY BUILDING:**
  Technical training on Data Dissemination Initiative (DDI) metadata conducted; anonymizing the microdata of one quarterly dataset is ongoing

- **DATA USE ASSESSMENT:**
  online survey and interview of key informants conducted

- **RESEARCH GRANT:**
  three Georgian researchers were awarded grants for practical research applied to national policy making, program design or investment decisions
  - six research proposals from Georgia were received for the 2022 Research Grant Competition
  - research findings were presented at the 2021 Global Data Use Conference, which also saw the participation of Georgia's Deputy Prime Minister, H.E. Levan Davitashvili

GEORGIA PREPARES PRELIMINARY ESTIMATE OF SDG INDICATOR 2.4.1 ON PRODUCTIVE AND SUSTAINABLE AGRICULTURE

Georgia is one of the Initiative's leading countries when it comes to estimating indicators relating to SDG 2 on Zero Hunger. Following the expansion and improvement of its annual Survey of Agricultural Holdings, which adopted the 50x2030 Agricultural Survey Program, it was able to make a preliminary estimate of the proportion of its agricultural area under productive and sustainable agriculture (SDG Indicator 2.4.1). This was in addition to estimates on labor productivity (2.3.1) and the income of small-scale food producers (2.3.2). Through its work with 50x2030, Georgia has been able to increase the scope of its national agricultural surveys and improve the quality of the data produced, with the results informing national agricultural policies and programs. The official estimates on SDG Indicator 2.4.1 are forthcoming.

Photo by Tomas Malik on Unsplash.

Madura Strait in Indonesia, photo by PlanetScope.

Indonesia

- **ONBOARDING ACTIVITIES:** inception meeting and pre-onboarding discussions commenced; support was provided to Badan Pusat Statistik (BPS) on questionnaire design (e.g., reviewing data needs, definitions, and questionnaire forms) and sampling methodology (e.g., target disaggregation levels, sample size calculations, and allocation of the sample size for different populations)

Kenya

- **ONBOARDING ACTIVITIES:** inception meeting and pre-onboarding discussions commenced; assistance was provided to Kenya National Bureau of Statistics (KNBS) to propose the sampling strategy and integration of census data with 50x2030 instruments

Photo by Curt Carnemark / World Bank

Photo by Simone D. McCourtie / World Bank.

Nepal

- **SURVEY OPERATION:** data processing and survey report finalized for the first Commercial Livestock Survey in the country
- **DATA DISSEMINATION:** results of the Agriculture Integrated Survey 2019, Chitwan (microdata) cataloged and disseminated via the CBS Microdata Library; dissemination of results for the Commercial Livestock Survey 2021 is still under discussion with Central Bureau of Statistics (CBS) and Ministry of Agriculture and Livestock Development (MoALD)

Nigeria

- **ONBOARDING ACTIVITIES:** assistance provided to the National Bureau of Statistics in the preparation of the National Agricultural Sample Census (NASC) (i.e., development, testing and finalization of the NASC listing questionnaire and the community-level questionnaire with the respective manuals); listing and community-level data collection organized; preparations are ongoing for the National Agricultural Sample Survey (NASS) to be implemented in FY23
- **CAPACITY BUILDING:** training of 165 trainers (primarily from NBS and the Ministry of Agriculture) and enumerators (more than 3000 interviewers) conducted

Cattle in Nigeria, photo by Abubakar Balogun on Unsplash

Senegal

- **SURVEY OPERATION:**
  the Annual Agricultural Survey 2021-2022 with the Income, Labor and Productivity (ILP) module was implemented allowing the computation of SDG Indicators 2.3.1 and 2.3.2, and the first compilation of SDG Indicator 5.a.1

- **DATA DISSEMINATION:**
  results of EAA 2020/21 disseminated; four annual survey datasets released through the Senegal Open Data platform and the National Microdata Archive

- **DATA USE ASSESSMENT:**
  questionnaire for the online survey and protocols for Key Informant Interviews (KII) finalized; online survey and KII conducted, with responses received from 113 respondents and 30 key informants respectively
  - meeting held with the IPAR think tank to discuss possibilities for collaboration
  - participated in the award ceremonies of the AgriData prize

- **RESEARCH GRANT:**
  three Senegalese researchers were awarded grants for practical research applied to national policy making, program design or investment decisions
  - ten research proposals from Senegal were received for the 2022 Research Grant Competition
  - research findings were presented at the 2021 Global Data Use Conference

Photo by Scott Wallace / World Bank.

Uganda

Photo by Social Income on Unsplash.

- **SURVEY OPERATION:**
  Data on agricultural productivity and incomes of small-scale food producers have been collected. These will be used to monitor SDG Indicators 2.3.1 and 2.3.2. Processing Annual Agricultural Survey (AAS) 2020/21 data and drafting the report were finalized; the Uganda Integrated and Harmonized Survey (UHIS) 2021/22 was launched, integrating the Uganda National Panel Survey and the Annual Agricultural Survey through the harmonization of survey instruments, integration of samples and alignment of field calendars
  - support was provided in the conduct of UHIS fieldwork planning and implementation, the monitoring and supervision of data collection, quality control for collected data, and data management
  - assistance was provided in the development of a data validation system (DVS) for identification and reporting of errors in the UHIS 2021, with a focus on improving the quality of the data. The DVS included all the quality checks already embedded in the CAPI system, plus a set of additional, more complex checks. If run in parallel with data collection activities, the DVS can help spot inconsistencies in the data while the enumerators are still in the field, allowing them to make corrections directly with the source (the farmer).

- **DATA DISSEMINATION:**
  report on the (AAS) 2019/20 finalized and launched; a set of interactive online tables produced and disseminated

- **DATA USE ASSESSMENT:**
  assessment report was produced, which mapped key actors and the constraints related to access, utilization, and demand for agricultural and rural data; a validation workshop was conducted, which saw the participation of data use stakeholders from the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF); the Uganda Bureau of Statistics (UBOS); donors and development sector organizations (USAID, FAO, World Bank, IFAD); researchers and academics; and the private sector.

- **RESEARCH GRANT:**
  three Ugandan researchers were awarded grants for practical research applied to national policy making, program design or investment decisions
  - thirty research proposals from Uganda were received for the 2022 Research Grant Competition
  - research findings were presented at the 2021 Global Data Use Conference

METHODOLOGICAL & RESEARCH WORK

FY22 HIGHLIGHTS — METHODS & TOOLS DEVELOPMENT

The 50x2030 Initiative prioritizes critical methodological research to produce more efficient and cost-effective tools and guidance, with the aim of improved agricultural and rural survey data at the national level. This is operationalized under the Methods & Tools Development component, through the validation of new technologies, exploration of ways to integrate survey data with other data sources, and improvement in questionnaire design. The following are outputs of the work during the reporting period which contributed to the increased effectiveness and visibility of the Initiative.

THE STATISTICAL JOURNAL OF THE IAOS DEVOTED A SECTION TO 50x2030

The work of the Initiative resulted in the publication of an open-access special section of the Statistical Journal of the International Association of Official Statisticians (IAOS) dedicated to 50x2030. Made up of eight papers, it covered the range of the Initiative's work with contributions from all components and the PMT. Among the papers were those on the Initiative and its approach, the experiences and challenges in collecting data for SDG2 Indicators, sampling design for integrated surveys, filling data gaps on individual land rights, improving post-harvest loss estimates, documenting the case of survey integration in Uganda, and how 50x2030 is facilitating data use for decision making.

ENSURING OUR RESEARCH IS AVAILABLE FOR ALL

The development of public goods, such as open-access research papers, facilitates the collection of higher quality data via 50x2030 Initiative survey programs and beyond. A total of 13 research papers were published over the course of the reporting period, including the eight published as part of the Special Section of the SJIAOS.[3] Seven additional pieces were underway and planned for completion in FY23, including one on the potential use of phone- and mixed-mode surveys for agricultural data collection. Additionally, the first two in the series of Technical Notes for Country Teams, which provide concise, implementation-focused guidance for data production teams on specific aspects of agricultural data collection, were published on non-standard units and post-harvest losses. Also, in an effort to ensure the 50x2030 questionnaire instruments reflect current best practices and user feedback, an updated version of the 50x2030 questionnaire package, including the technical guidance note on questionnaire design and the questionnaire instruments themselves, was developed to incorporate findings from methodological research conducted by the Initiative and published during the reporting period. The subsequent iteration of the questionnaire tools progressed during the period, with the primary improvement centering on the georeferencing protocols recommended by the Initiative, informed by research on the integration of surveys and satellites conducted under the Initiative.

3 The papers published in FY22 include:

- The eight papers of the special section of the SJIAOS (here)
- Is Dirt Cheap? The Economic Costs of Failing to Meet Soil Health Requirements on Smallholder Farms
- Non-Labor Input Quality and Small Farms in Sub-Saharan Africa: A Review
- Measuring Disaster Crop Production Losses Using Survey Microdata: Evidence from Sub-Saharan Africa
- Nonclassical Measurement Error and Farmers' Response to Information Reveal Behavioral Anomalies
- Survey Measurement Errors and the Assessment of the Relationship between Yields and Inputs in Smallholder Farming Systems: Evidence from Mali

COMBINING EARTH OBSERVATION WITH GROUND-LEVEL DATA

The Initiative's research on the integration of satellite and survey data advanced significantly during the reporting period. Building on previous work of the Initiative, which identified the optimal protocols for the collection of survey data to improve satellite-based crop type mapping models, the Uganda National Study on Objective Measurement in Agriculture (UNOMA) was designed and launched. The study, which is embedded in the 50x2030-supported Uganda Harmonized Integrated Survey, focuses on methodological questions around the integration of surveys and satellites for maize yield estimation, while also incorporating elements of methodological validation around crop variety identification and the measurement of crop damages and losses. Fieldwork for UNOMA will conclude in FY23. In addition to the launch of the rich methodological work of UNOMA, work progressed to expand the set of high-resolution, open access crop and maize area maps (for Ethiopia and Malawi). Efforts undertaken in FY22 will result in the publication of several additional high-resolution mapping products (to be completed in FY23), including yield maps for select crops and seasons for Ethiopia, Malawi, and Mali.

IMPACT OF TIME ON THE RECALL OF FISHERY INCOME

Recall bias can contribute significantly to measurement error in surveys. Typically, the longer the period of recall the greater the likelihood of error. Studies also tend to show that memory decay increases with longer recall periods and is greater for less salient events. The estimation of fishery income using survey data is particularly prone to this type of error. Through the 50x2030 Initiative, an experiment on recall bias in fisheries data collection is being conducted in Cambodia with the aim of determining a cost-effective recall period for collecting data on fishery catches, income and expenses. In addition, the study is testing the use of mobile phones for periodical collection of fishery data. The experiment was launched in FY22, and the conclusion is expected in FY23.

PARTNERSHIPS FOR BETTER DATA ON GENDER

Engagement with Emory University and IFPRI continued, with the development and validation of the Women's Empowerment Metric for National Systems (WEMNS). In the previous period, cognitive interviewing activities around the tool were finalized, which led to revisions to the questionnaire instrument. These were subsequently piloted successfully in Bangladesh, Malawi, and Nepal in August 2021. This, and the follow-up pilots implemented in March 2022, were conducted via phone surveys, given continued constraints related to COVID-19. A round of face-to-face pilots is planned for these countries. A single-round phone-based pilot was also implemented in Guatemala in Spring 2022.

BREAKING NEW GROUND ON SOILS, HEALTH, AND CLIMATE

The Initiative made great strides in research related to natural resources, including soil health and climate, and is poised to launch methodological studies in FY23. In preparation for methodological validation, the Soil Sessions were organized in November 2021 with experts and stakeholders aimed at identifying priority research areas related to soil health monitoring and innovative technologies that have the potential to transform the way soil data is collected in agricultural surveys. In parallel, various partnerships for research on soil health were explored, including with iSDA, ICRAF, LandPKS, the Micronutrient Action Policy Support (MAPS) program, academia, and the World Bank's Agriculture and Food Global Practice. A line of work was initiated following the Soil Sessions on the development of sampling strategies for soil analysis integrated into agricultural and rural surveys. Similar efforts were undertaken related to the measurement of high-resolution climate and weather data, and its impact on agricultural production, food security, and sustainability, among other outcomes. In preparation for methodological validation around the feasibility and sustainability of integrating objective measurements of climate and weather in agricultural and rural surveys, a review of the current evidence as well as the menu of tools available was undertaken, and data exploration and mapping of existing data from Ethiopia to inform sampling designs and the optimal site selection for weather sensors was conducted. Exploratory conversations were also held with leading technology providers (including Arable and Davis Instruments) and geospatial climate data producers (including SERVIR and CHIRPS). The research on natural resources prepared in FY22 will be a priority research agenda in the coming years.

RESEARCH SPOTLIGHT:

IMPROVING SURVEY METHODS TO MEASURE PRODUCTION LOSSES FROM DISASTERS

Each year, disasters cause billions of dollars in crop production losses. The quantity of calories associated with these losses could potentially cut undernourishment in half in low-income countries. These losses threaten the livelihoods of the poorest and are likely to be exacerbated by climate change in the future. Preventive action against disaster-induced damages and losses has been identified as key for economic development and reflected in Sustainable Development Goal 1.5.2 and Sendai Framework Indicator C.

A prerequisite for such action is the accurate, fine-grained measurement of crop production losses to inform official statistics and policies. While macrodata can miss the specific impacts of disasters on vulnerable populations, microdata is key to better understanding the nature and extent of shocks faced by smallholder farmers as well as the distributional patterns of disaster-induced impacts.

Crop losses due to disaster faced by smallholder farmers was explored by drawing on data from the Living Standards Measurement Study-Integrated Survey on Agriculture (LSMS-ISA), including a total of 130,000 plots on nearly 30,000 farms across six countries: Ethiopia, Malawi, Mali, Niger, Nigeria, and Tanzania (see the initial working paper). Here's what we learned:

1. **Crop loss from disasters is prevalent across countries** and **stems from a diverse set of shocks**. Overall, 44% of plots in the sample report crop loss. Farmers reported losing, on average, 47% of their harvest on plots affected by crop shocks. Farmers experience a diverse range of shocks, with drought being the most prevalent but pests and irregular rain also widespread.

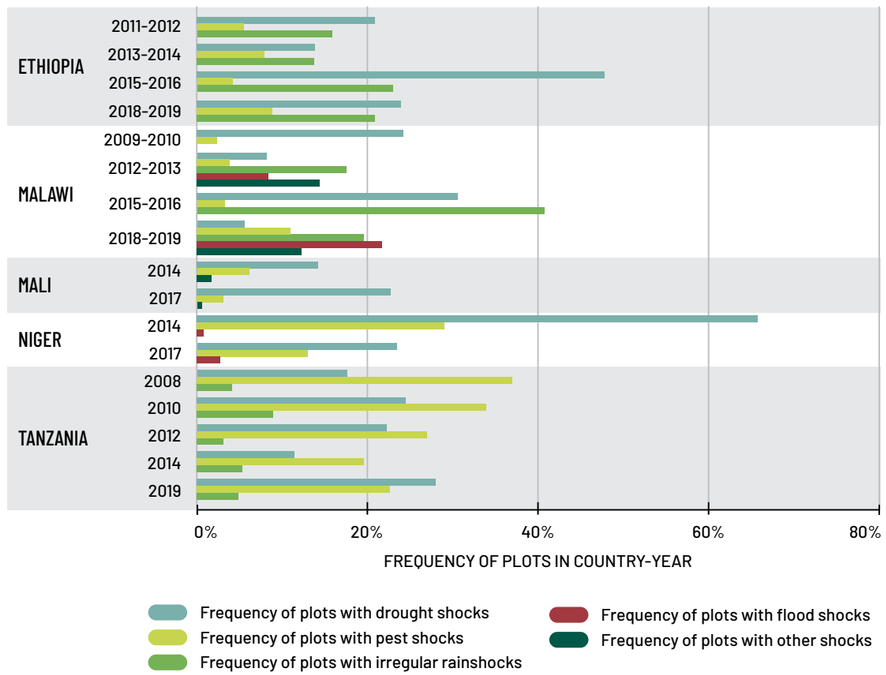
2. Estimating crop loss is a complex and cognitively challenging problem, and evidence suggests that **farmers' estimates of crop losses suffer from widespread measurement error**. Farmers' perceptions of disasters and their impacts on crop production are necessarily subjective. Conditions that one farmer perceives as a drought may be perceived as typical by another, for example. Reported losses, in turn, likely depend on the perceived severity of a disaster.

3. Conscientious **survey design and innovative measurement tools can help minimize measurement error**. Survey questions on crop production losses can be redesigned in an easy-to-understand manner to reduce cognitive burden. We also see potential in complementing face-to-face agricultural surveys with higher-frequency phone-based surveys, which can reduce recall burden for respondents and can be more flexible in timing to enable quick reaction to emergencies and disasters. Recent 50x2030 research explores the potential of phone-based surveys for agricultural data collection.

4. **Tools and technologies can complement subjective reporting by providing more objective measures related to the occurrence and impact of disasters**. In situ weather sensors installed in communities would allow for the monitoring of local weather-related shocks, objectively and in real time. Crop cutting, which enables more reliable estimates of crop yield and is currently implemented in some countries, can be scaled-up and protocols amended to capture production losses. Finally, remote sensing used alongside agricultural and household surveys for ground truthing and calibration can offer new ways of estimating disaster-induced crop production losses.

These findings, coupled with those from the methodological study on measuring damages and losses embedded in the Uganda National Study on Objective Measurement in Agriculture (UNOMA), will inform the **production of practical guidelines** for best practices in data collection for use by 50x2030 teams and beyond.

FIGURE 1. FREQUENCY AND BREAKDOWN OF CROP SHOCKS



OUTREACH & ADVOCACY

2021 GLOBAL DATA USE CONFERENCE

The Initiative convened the first 50x2030 Global Data Use Conference, held virtually from November 30 to December 2, 2021. The event featured 52 speakers — including the Vice Prime Minister of Georgia — and 26 sessions covering 16 hours of streamed content over three consecutive days. Over 820 people registered for the event, representing 100 countries and around 384 institutions[4].

THE CONFERENCE HAD THREE MAIN OBJECTIVES:

1. Raise awareness of and demand for the use of survey data to address development challenges, inform policies and programs, and provide solutions for investments.
2. Establish networks of decision makers among regions of the world that face similar challenges in achieving food security and sustainable agricultural growth.
3. Facilitate knowledge creation, learning exchange and capacity building.

The Conference showcased key examples of the application of 50x2030 survey data in partner countries, focusing on the results of the Research Grant Competition held in 2021, which could be used by decision makers for informed decision making.

Table 1 describes the thematic areas tackled in the various research papers as well as the originating countries that submitted them.

Through the research grant competition, grantees presented their findings — resulting from the use of 50x2030 data — to government officials and other stakeholders at national and international levels, with a view to influencing policy decisions. A few examples include:

- A digital copy of the research paper, *Determinants of adoption of climate smart and sustainable coffee production practices and its impacts on coffee productivity and coffee revenue,* was shared with the head of research at the Uganda Coffee Development Authority.
- A research paper was provided to a group of Cambodian scholars, including a senior representative of Cambodia at the WTO, an economist at the Institute of Capacity Development at the IMF, and a director at the Center for Policy Studies.
- Research findings and recommendations on the importance of developing comprehensive national migration and remittance policies were presented to the Ethiopian Ministry of Labor and Social Affairs.
- A workshop was conducted in Cambodia to engage the Ministry of Industry, Science, Technology, and Innovation, disseminate the research findings and influence policy recommendations.

TABLE 1

SESSION NAME (THEME)	NO. OF PAPERS	COUNTRIES
Towards commercialization	3	Cambodia and Uganda
Land rights and productivity through the gender lens	3	Uganda and Senegal
Looking at employment, migration, and resilience in rural and agricultural development	3	Ethiopia and Senegal
Adoption of improved agricultural practices	3	Georgia and Uganda
Using data to analyze agricultural productivity and crop distribution	3	Cambodia and Georgia
Improving rural welfare	3	Ethiopia and Uganda

4 Looking at the audience in broader terms, the registered participants were almost equally distributed among Data Producers (41%), Data Intermediaries (27%), and Data Users (32%), with 14% of the Registrants describing themselves as Decision Makers. Moreover, all the target sectors were well covered: Government (23%), Academia and Research (32%), Donor/Development Organizations (19%), Private Sector (9%) and Civil Society/Media (6%).

FROM RESEARCH TO POLICY MAKING: FINDINGS FROM THREE SELECTED PAPERS

Through in-country consultations, stakeholders — particularly those in the government and development sectors — suggested a number of priority research areas that could inform programming and policy making in their respective countries. Three such areas studied by three of the 2021-funded papers were the effect of environmental shocks on the resilience of rural households in Senegal, the determinants of nutrition and food security for rural households in Uganda, and gender and agricultural productivity in Senegal. The key findings and policy implications from these three selected Research Grant Papers presented at the first Global Data Use Conference are shown as follows.

***Agricultural household resilience strategies against climatic and health shocks: Drought and COVID-19 in the Niayes area of Senegal*, by Awa Diouf and Thierno Bocar Diop**

The study employed Senegal's 2019/2020 annual agricultural survey (*Enquête Annuelle Agricole*) to investigate the effectiveness of different household resilience strategies in the face of shocks. It found that, in response to recent droughts and the COVID-19 pandemic, exogenous resilience measures including provision of government and NGO assistance were more effective than endogenous ones, such as the undertaking of off-farm activities and the sale of farm assets. However, the authors also argued that exogenous support measures face two important limitations:

1. long-term sustainability, and
2. rendering vulnerable households dependent on external aid and exacerbating their vulnerability in the long run.

As such, the main policy implication is that the government and aid agencies must utilize mixed support measures that provide both direct aid to farmers and improve the enabling environment for resilience strategies such as off-farm income-generating activities (e.g., through credit, infrastructure, and education).

***Farm production diversity, household dietary diversity and nutrition: Evidence from Uganda's National Panel Survey*, by Haruna Sekabira et al.**

The study used data from the Uganda National Panel Survey to study the impact of animal and crop production diversity on the nutrition security of agricultural households. Looking at nutrition security indicators such as household dietary diversity scores (HDDS) and available energy, iron, zinc, and Vitamin A per adult, the researchers identified different ways in which these indicators are associated with the count of animal and crop species within an agricultural household. The animal species count is strongly associated with better HDDS, and energy and micronutrient sources from consumption of own-farm produce, while the crop species count is more strongly and positively associated with available energy and micronutrients, irrespective of the source (i.e., own farm or markets). Based on these findings, policies that encourage crop species diversification on farm are more effective in increasing nutrition security in Uganda because this results in farms producing a wider range of nutritious food.

***Differences in agricultural productivity among women and men on small-scale farms in Senegal: Contributions of agricultural innovations*, by Aboubacry Kane and M. M. Aidara**

Data from Senegal's 2019/2020 annual agricultural survey (Enquête Annuelle Agricole) was used to measure gender gaps in agricultural productivity and in the use of technological innovations. First, the authors found that plots managed by women are, on average, more productive than those managed by men, due to the fact that women typically cultivate smaller plots more intensively. With respect to the role of technology, the study found that 1) the use of agricultural innovations (e.g., certified seed, fertilizers, and motorized equipment) is significantly associated with increased agricultural productivity; and 2) agricultural innovations are more commonly used on plots managed by men compared to those managed by women. These findings show that there is an underutilization of women's productive capacities. To close this gap and unleash the productivity of Senegalese women farmers, the authors recommended facilitating access to land for women to enable them to cultivate larger areas; ensuring the availability of innovations and increasing women's ability to bear the cost of accessing and using them; and subsidizing motorized equipment for women.

Photo by Dibakar Roy, on Unsplash.

Photo by Annie Spratt on Unsplash.

OTHER EVENTS OF THE INITIATIVE

During FY22, the Initiative organized and was involved in a number of events, including:

AUGUST 18, 2021

50x2030 at the 31st International Conference of Agricultural Economists: Measurement Matters and Agricultural Economists Should Care: How the 50x2030 Initiative can make a difference

SEPTEMBER 30, 2021

50x2030 Seminar: Transforming Food Systems in Africa: Resilience through agricultural data

OCTOBER 6, 2021

50x2030 at World Data Forum: Showcasing how ground data can augment satellite and other tech-based data collection

GOVERNANCE & MANAGEMENT

RESOURCE MOBILIZATION

The PMT leads the Initiative's resource mobilization effort through donor outreach, partnership development, knowledge sharing and policy advocacy. The resource mobilization strategy reflects the initiative's components and budget line items: data production, associated technical assistance, methods and tools development, data use, program coordination and policy advocacy. The PMT adopts a two-stream approach: (i) IDA/IBRD to finance data production, and (ii) donor community/development partners to finance overall technical assistance efforts including methods and tools development, data use, program coordination and policy advocacy.

- **FINANCING THROUGH IDA/IBRD:**
  World Bank has large-scale investments in agriculture sector mainly in IDA as well as some IBRD countries. In recent years, there have been investments in data through regional and national statistics projects, especially in African countries. These IDA/IBRD-financed projects have scope for supporting data production activities such as surveys in the agricultural sector. Therefore, a major focus of the PMT is partnering with World Bank country operations, particularly with Agriculture and Food and Poverty and Equity Global Practices to access IDA/IBRD resources for data production.

  Starting in FY22, the PMT successfully mobilized $182 million of IDA resources for agricultural survey programs. This covers 30 countries with an average of four to five years of support, through partnering with six IDA-financed projects, four regional statistics projects, and two agricultural projects in Africa and South Asia.

- **DONOR COMMUNITY/ DEVELOPMENT PARTNERS:**
  The PMT reaches out to donors and bilateral development partners to meet the financing gap for overall technical assistance for data production, methods and tools development, data use and program coordination and policy advocacy. The PMT's outreach efforts begin with quantifying financing gaps, diagnosis of donor priorities, and mapping potential resource partners. These are followed by engagements with bilateral and multilateral agencies, and negotiations for long-term partnerships. Raising awareness of the program in global platforms, knowledge exchange and communication of results are key activities that complement as well as enable the PMT's resource mobilization efforts.

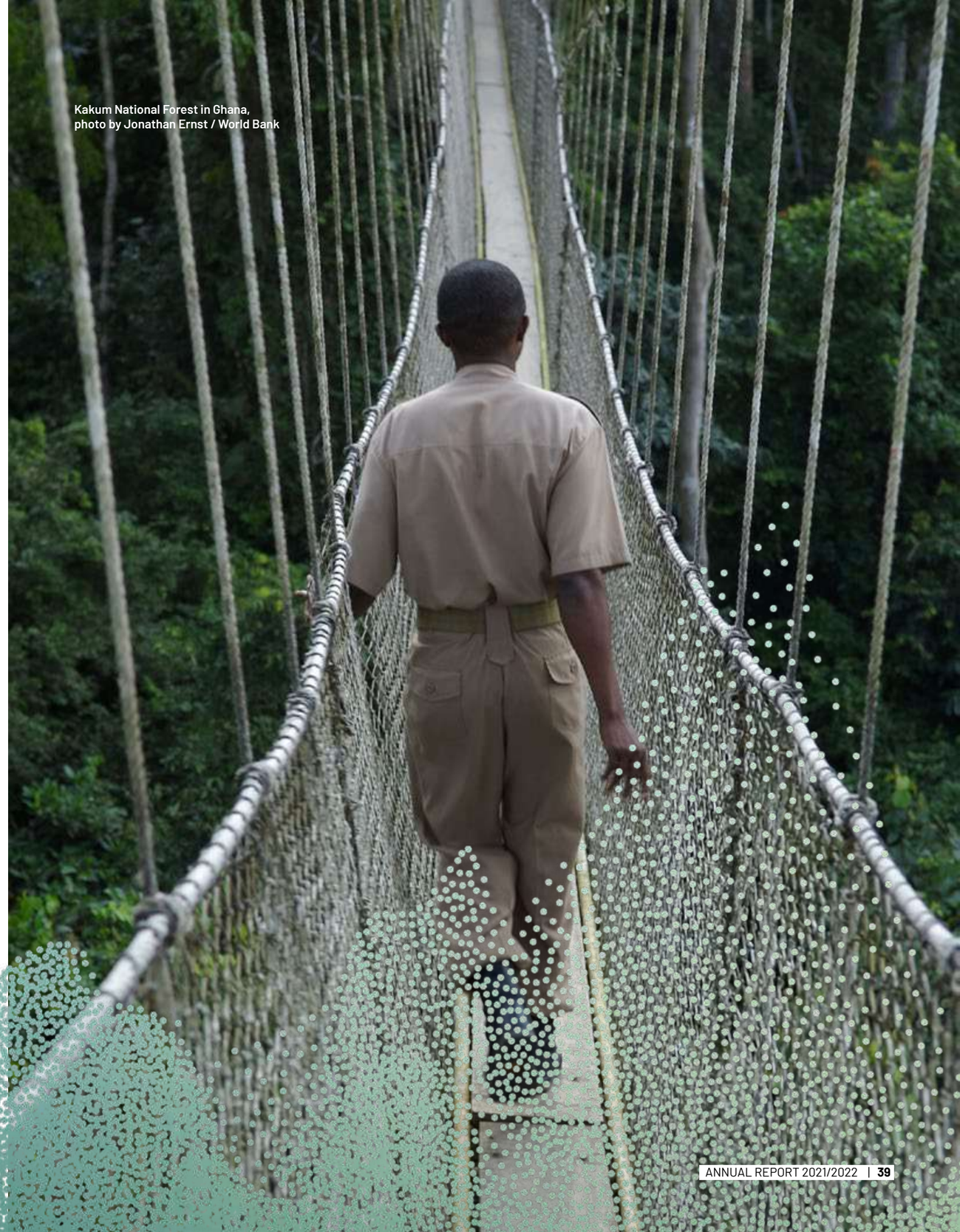
FORGING AHEAD

Significant milestones have been achieved during the period, including the establishment of key program protocols, processes, and systems that serve as guides for the operations of the Initiative. Technical guidelines on agricultural surveys and resources on methodological developments and tools have been produced. Initial implementation of data production and data use activities has commenced, and new country engagements have been launched.

In FY22, the PMT focused on deepening collaboration with the World Bank Global Practices to secure IDA project resources for survey data collection. Two regional IDA statistics projects have allocated approximately USD 40 million of funding for agriculture survey data collection that benefits nine countries (Burkina, Cape Verde, Côte d'Ivoire, Ghana, Kenya, Liberia, Sierra Leone, Tanzania, and Togo).

New rounds of discussion were also launched in order to include a 50x2030 component in other Statistical Capacity Building projects of the World Bank. This translated into the mobilization of an additional USD 120 million in IDA resources to cover 14 new initiative countries from sub-Saharan Africa. In this latter group of projects, the 50x2030 team took part in the project preparation process and has a dedicated component within the project. Outside sub-Saharan Africa, the Initiative is partnering with two new countries, Indonesia and Nepal, and there will be an incremental effort to diversify the outreach in different regions of the developing world.

Looking to FY23 and beyond, the 50x2030 Initiative will endeavor to expand its outreach within the World Bank and engage other Global Practices that might have an interest in agricultural statistics. Also, the team will expand its country engagement, strengthen partnerships with donors, intensify resource mobilization efforts, scale up implementation of activities in countries, widely disseminate the outputs and results of the initiative, deepen outreach, and contribute to global dialogue.



Kakum National Forest in Ghana, photo by Jonathan Ernst / World Bank

ANNEXES

ANNEX 1. METHODOLOGY-RELATED RESEARCH PAPERS & PUBLICATIONS

The following research papers and technical documents have been developed under the Methods & Tools Development component during the reporting period.

PAPERS

PUBLISHED IN FY22:

1. Closing the data gap in agriculture through sustainable investment in the data value chain: Realizing the vision of the 50x2030 Initiative (SJIAOS Special Section)
2. From agricultural statistics to zero hunger: How the 50x2030 Initiative is closing data gaps for SDG2 and beyond (SJIAOS Special Section)
3. The 50x2030 Initiative and production of SDG 2 indicators: Country challenges and experiences (SJIAOS Special Section)
4. Integrated sampling design for agricultural and socio-economic households surveys: Overview and application in Uganda Harmonized Integrated Survey (SJIAOS Special Section)
5. Individual land rights: Filling data gaps with the 50x2030 Initiative (SJIAOS Special Section)

6. Combining farm and household surveys with modelling approaches to improve post-harvest loss estimates and reduce data collection costs (SJIAOS Special Section)

7. The integration of socio-economic and agricultural surveys by national statistical offices: The case of the Uganda Integrated Household Survey (SJIAOS Special Section)

8. Facilitating data use for decision making: 50x2030's approach (SJIAOS Special Section)

9. Is Dirt Cheap? The Economic Costs of Failing to Meet Soil Health Requirements on Smallholder Farms

10. Non-Labor Input Quality and Small Farms in Sub-Saharan Africa: A Review

11. Measuring Disaster Crop Production Losses Using Survey Microdata: Evidence from Sub-Saharan Africa

12. Nonclassical Measurement Error and Farmers' Response to Information Reveal Behavioral Anomalies

13. Survey Measurement Errors and the Assessment of the Relationship between Yields and Inputs in Smallholder Farming Systems: Evidence from Mali

UNDER DEVELOPMENT IN FY22:

- From Necessity to Opportunity: Lessons for Integrating Phone and In-Person Data Collection for Agricultural Statistics in a Post-Pandemic World (published in early FY23)
- Measuring Land Tenure at the Individual Level: Lessons from Methodological Research in Armenia (published early FY23)
- Assessing Land Area from Space: Are Satellite Methods a Compliment to or Substitute for GPS Measurement?
- Paper on impact of survey design on measurement of individual land rights
- Paper #1 on the integration of surveys and satellites
- Paper #2 on the integration of surveys and satellites
- The relative accuracy of intercropped area computation based on farmer-reported information vis-à-vis comprehensive objective measurements of crop area coverage on intercropped plots
- Unearthing the drivers of the gender gap in agricultural productivity: Longitudinal evidence from Malawi
- Measurement error in farmer-reported information on cultivated crop varieties and attributes vis-à-vis objective identification

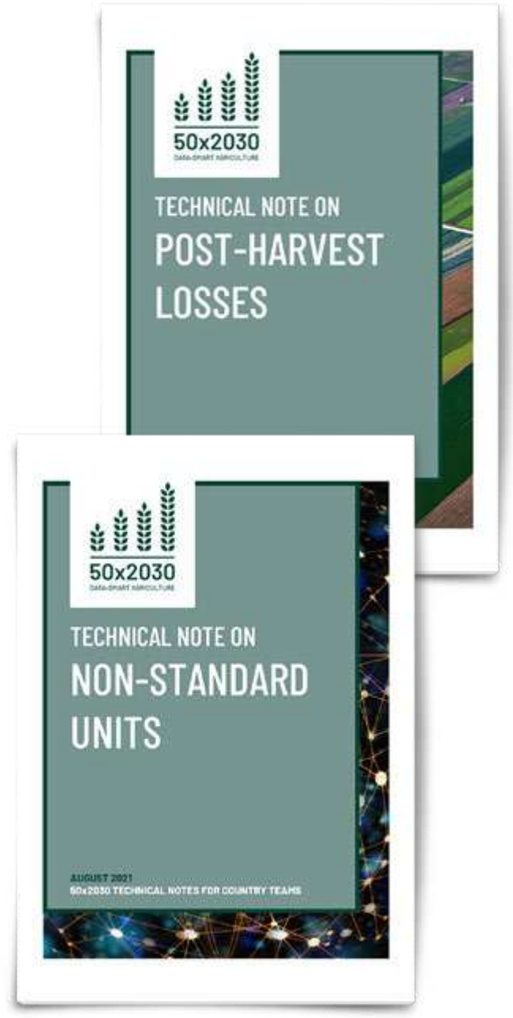
TECHNICAL NOTES & GUIDANCE DOCUMENTS

PUBLISHED IN FY22:

1. Technical Note on Non-Standard Units
2. Technical Note on Post-Harvest Losses

UNDER DEVELOPMENT IN FY22:

- Technical Note on Land Area Measurement
- Technical Note on Georeferencing in Household and Farm Surveys
- Guidance on use and adaptation of the survey management system
- Guidelines for the Integration of DNA Fingerprinting in National Surveys
- Guidelines and Data Collection Protocol for the Integration of Surveys and Satellites



LIST OF ABBREVIATIONS

AAS	Annual Agricultural Survey
AGRISurvey	Agricultural Integrated Survey
AgSS	Agricultural Sample Survey
ARMSTAT	Statistical Committee of the Republic of Armenia
BMGF	Bill & Melinda Gates Foundation
BMZ	Federal Ministry for Economic Cooperation and Development, Germany
BPS	Badan Pusat Statistik
CAADP	Comprehensive Africa Agriculture Development Programme
CAMSTAT	Cambodia National Indicator Reporting Platform
CAS	Cambodia Agricultural Survey
CBS	Central Bureau of Statistics
CFS	Commercial Farm Survey
CHIRPS	Climate Hazards Group InfraRed Precipitation with Station Data
CLIS	Commercial Livestock Integrated Survey (Nepal)
DDI	Data Dissemination Initiative
DVS	Data Validation System
EAA	Enquête Annuelle Agricole (Annual Agricultural Survey)
ESS	Ethiopian Socioeconomic Survey
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
GPS	Global Positioning System
GSAH	Georgia Survey of Agricultural Holdings
IAOS	International Association for Official Statistics
ICRAF	World Agroforestry Centre
IDA	International Development Association
IFAD	International Fund for Agricultural Development
IFPRI	International Food Policy Research Institute
ILP	Farm Income, Labor, and Productivity Questionnaire
iSDA	Innovative Solutions for Decision Agriculture
KII	Key Informants Interviews
LandPKS	Land Potential Knowledge System
LLMIC	Low and lower-middle income countries
LSMS-ISA	Living Standards Measurement Study-Integrated Survey on Agriculture
M&E	Monitoring & Evaluation
MAAIF	Ministry of Agriculture, Animal Industry and Fisheries
MAPS	Micronutrient Action Policy Support
MoALD	Ministry of Agriculture and Livestock Development (Nepal)
NASC	Nigeria Agricultural Sample Census
NASS	National Agricultural Sample Survey (Nigeria)
PME	Production Methods and Environment
PMT	Program Management Team
SAH	Georgia Survey of Agricultural Holdings
SDG	Sustainable Development Goal
SJIAOS	Statistical Journal of the International Association for Official Statistics
UBOS	Uganda Bureau of Statistics
UHIS	Uganda Integrated and Harmonized Survey Programme
UNOMA	Uganda National Study on Objective Measurement in Agriculture
USAID	United States Agency for International Development
WB	World Bank
WEMNS	Women's Empowerment Metric for National Systems

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