



Food and Agriculture Organization
of the United Nations

Agricultural Science and Technology Indicators (ASTI) Webinar Series - 1

ASTI Update & Data Collection Process 2025

August 2025



Introduction



Overview of the ASTI project



UN-CEAG Guidelines to develop Agricultural Science and Technology indicators



FAO Questionnaire on ASTI Data Collection 2025



Online Community of Practice on ASTI



Q&A and next steps

What is ASTI?

A global reference on agriculture R&D investments and capacity of NARS

Over two decades the ASTI program, formerly managed by the International Food Policy Research Institute (IFPRI), collected institutional investment and human resources data from agricultural R&D agencies in developing countries worldwide. ASTI has now transitioned to FAO.

Why ASTI: quantitative data are essential for agriculture development to:

- analyze trends in agricultural R&D capacity, investments, and outputs
- better coordinate agricultural R&D across institutes, regions, and commodities
- identify gaps
- set future investment priorities

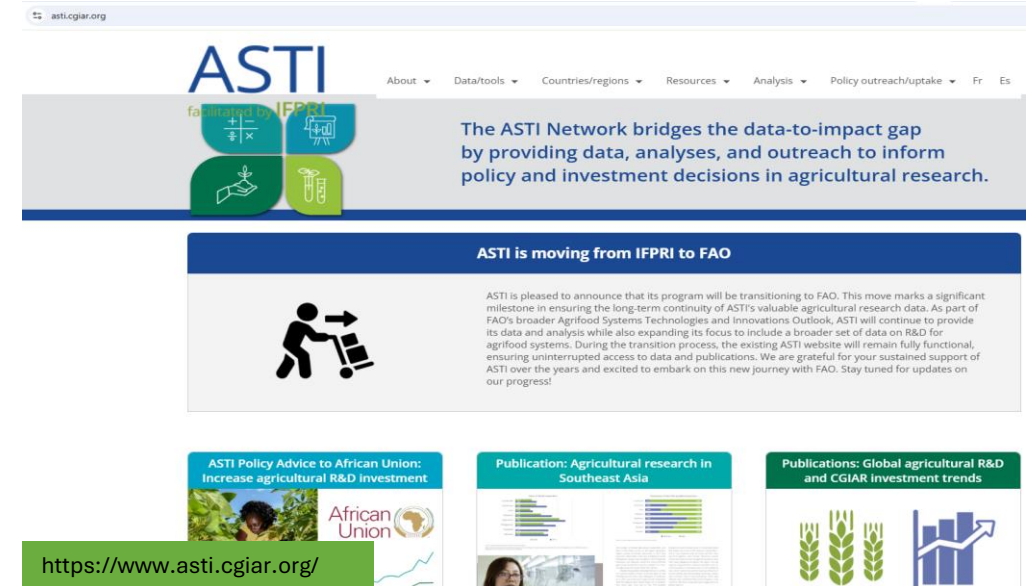


Users of ASTI

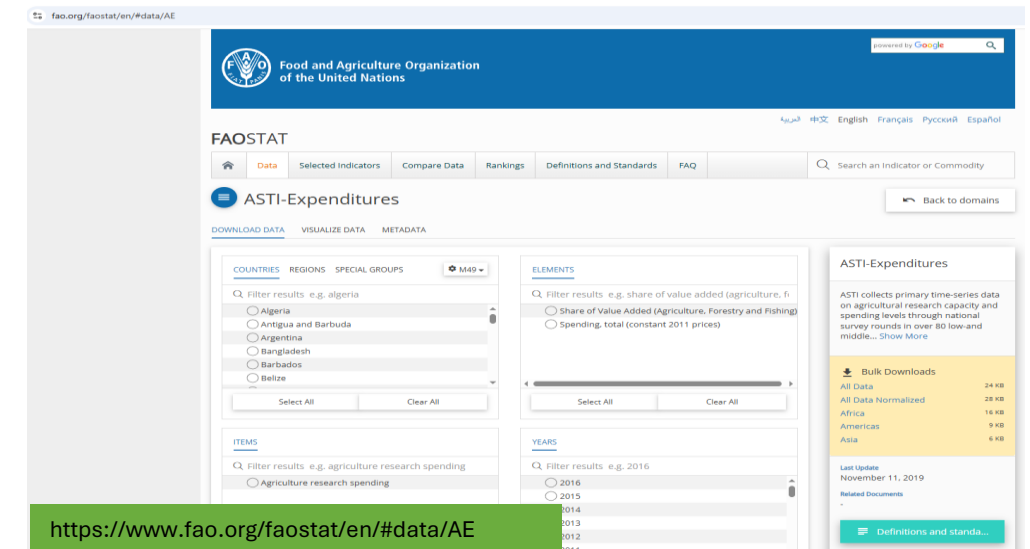


The ASTI survey and implementation methodology

- The methodology of the ASTI survey aligns with the Frascati Manual (OECD), which ensures compatibility of the data over time.
- The scope of ASTI is basic and applied research and experimental development (R&D) for primary production.
- Agricultural R&D (adopted by ASTI): Crops, livestock, forestry, fisheries, natural resources, and the socioeconomic aspects of primary agricultural production. On-farm storage and processing of agricultural products.
- Some of ASTI datasets will now be integrated into FAOSTAT



The screenshot shows the ASTI website header with the logo "ASTI facilitated by IFPRI". The navigation menu includes: About, Data/tools, Countries/regions, Resources, Analysis, Policy outreach/uptake, Fr, and Es. A banner states: "The ASTI Network bridges the data-to-impact gap by providing data, analyses, and outreach to inform policy and investment decisions in agricultural research." Below this, a blue box announces: "ASTI is moving from IFPRI to FAO". It features an icon of a person with a shopping cart and text explaining the transition to FAO's broader Agrifood Systems Technologies and Innovations Outlook. At the bottom, there are three featured publications: "ASTI Policy Advice to African Union: Increase agricultural R&D investment", "Publication: Agricultural research in Southeast Asia", and "Publications: Global agricultural R&D and CGIAR investment trends". A URL bar at the bottom shows <https://www.asti.cgiar.org/>.

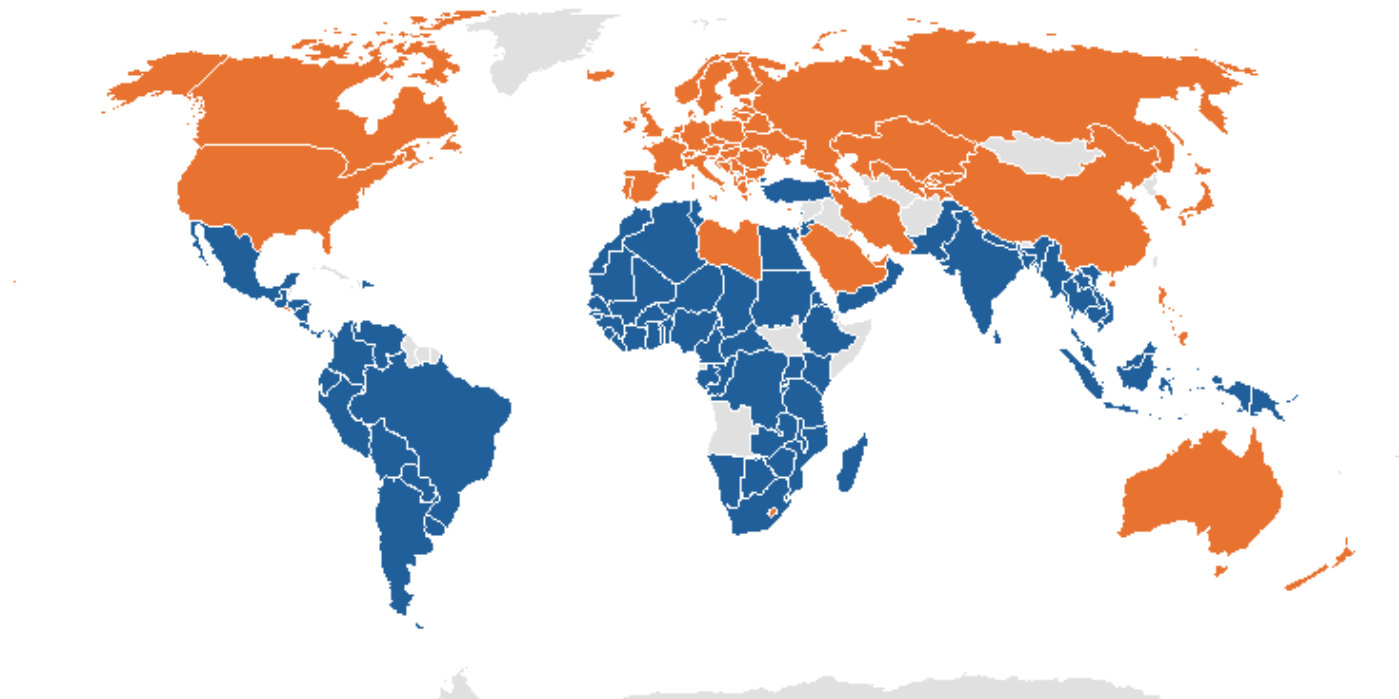


The screenshot shows the FAOSTAT website header with the logo "Food and Agriculture Organization of the United Nations". The navigation menu includes: Data, Selected indicators, Compare Data, Rankings, Definitions and Standards, and FAQ. A search bar is present. The main content area is titled "ASTI-Expenditures" and includes a "Back to domains" link. Below this, there are four panels: "COUNTRIES" (with a list of countries including Algeria, Antigua and Barbuda, Argentina, Bangladesh, Barbados, and Belize), "ELEMENTS" (with radio buttons for "Share of Value Added (Agriculture, Forestry and Fishing)" and "Spending, total (constant 2011 prices)"), "ITEMS" (with a list of items including "Agriculture research spending"), and "YEARS" (with a list of years including 2016, 2015, 2014, 2013, 2012, and 2011). A "Bulk Downloads" section on the right lists various data files and their sizes. A URL bar at the bottom shows <https://www.fao.org/faostat/en/#data/AE>.

ASTI coverage

IFPRI collected Ag R&D data in collaboration with NARIs from ~100 LMICs directly from 3,100 Ag R&D agencies

Eurostat, OECD and other middle&high-income countries collect R&D data using R&D surveys or admin data



FAO plans to extend the coverage of the dataset to all member countries

ASTI dataset and outputs

FIGURE 2 | Long-term trends in agricultural researchers and research spending, 1981–2013

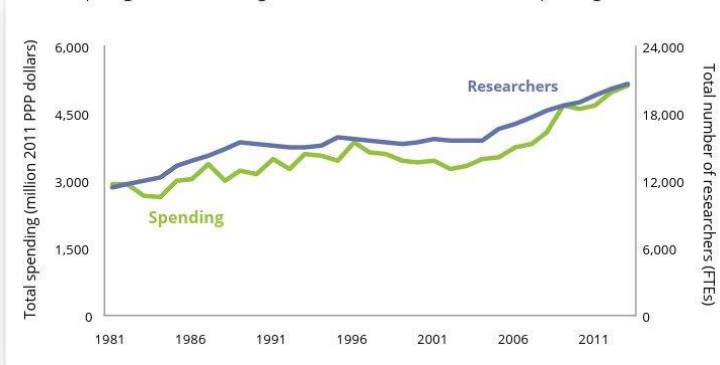
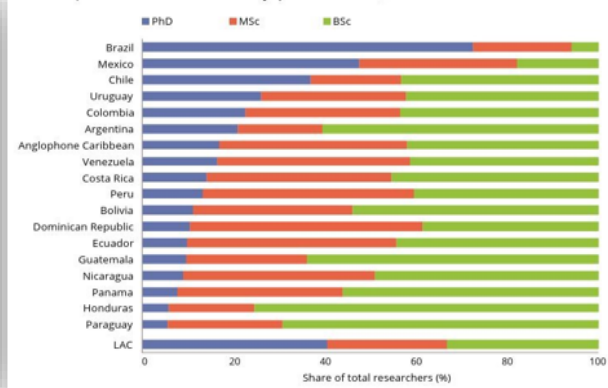


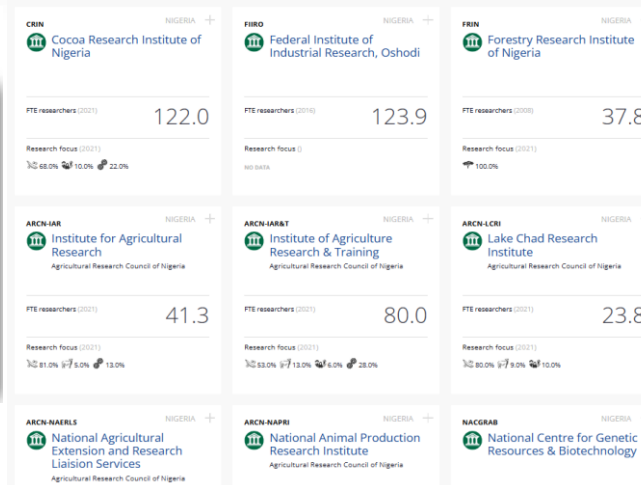
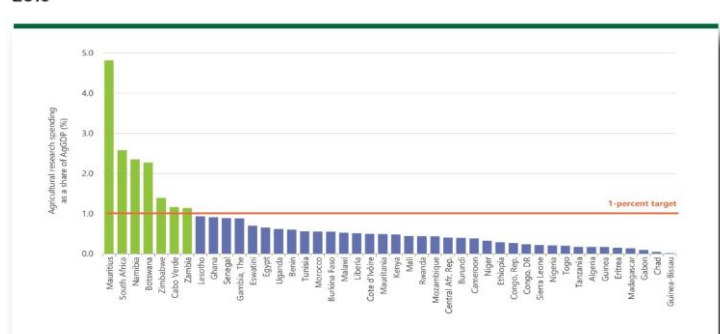
FIGURE 7 | Distribution of researchers by qualification level, 2012/2013



FAO-ASTI dataset

- Ag R&D total spending (by cost category)
- Ag R&D staff (by degree and gender)

Figure 7—Country-level agricultural research spending as a share of agricultural GDP, 2016



FAO Outputs

- Country Tier I indicators in FAOSTAT
- Agency directory in STI portal

FAO-ASTI project: Institutionalization & sustainability

- ❖ Goal: to standardize, harmonize, and improve the overall quality, timeliness, and completeness of the ASTI dataset, while making it more sustainable and country owned.
- ❖ Harmonization and standardization, as well as country ownership and institutionalization through UN system mechanisms, including regional and global statistical commissions

2023

- Comprehensive assessment of the ASTI Program
- Roadmap for the integration of ASTI into FAO

2024

- Piloting the new ASTI data collection approach
- Review of the pilot outcomes to formulate recommendations in a lessons learned report
- Draft a set of Guidelines for the production of ASTI by countries

2025

- Global rollout: regular annual data collection round of Tier 1 variables across all FAO members
- Institutionalization of ASTI at the national and global level
- Dedicated in-country technical assistance and engagement with existing R&D data systems

UN Committee of Experts on Agricultural and Rural Statistics (UNCEAG) Workstream on ASTI

The Programme of Work (2024–2027) of the Committee discussed at the 55th session UN Statistical Commission (UNSC) created a workstream on Agricultural R&D Indicators, with the aim of producing guidelines for data collection, and review and harmonize methodologies.

To guide the in-country data collection and production of harmonized and comparable indicators to monitor NARS...

The UN-CEAG *Guidelines for developing ASTI* is currently undergoing a global consultation process (June- mid-August 2025) and proposed for endorsement by the UNSC in 2026



Food and Agriculture Organization
of the United Nations

English



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Global Consultation on the Guidelines for Developing Agricultural Science and Technology Indicators (ASTI)

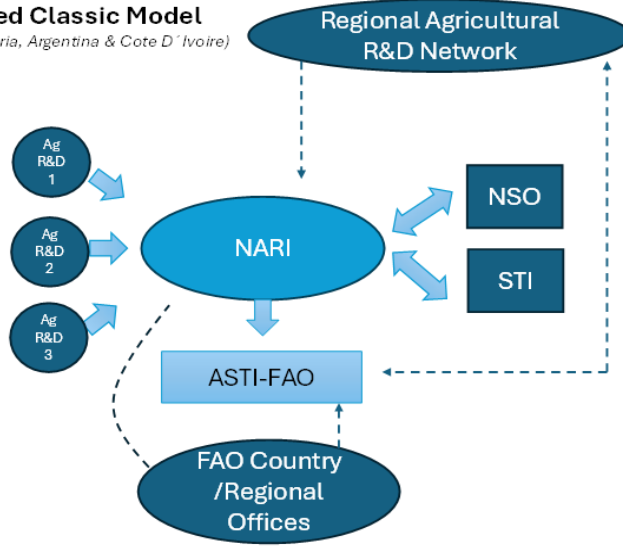
>> CONTRIBUTE UNTIL 15 AUGUST 2025

The draft of the *Guidelines for Developing Agricultural Science and Technology Indicators* is available for your reading. To take part in this consultation, please download and complete the Comment form below and send it to FAO-ASTI-Questionnaire@fao.org no later than 15 August 2025.

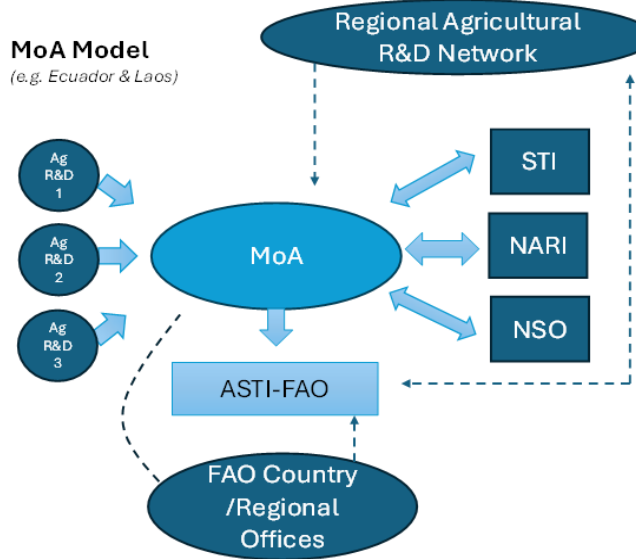
- [Download the proposed ASTI Guidelines](#)
- [Download the Annex: ASTI questionnaire template](#)
- [Download the Comment form](#)

New ASTI production models

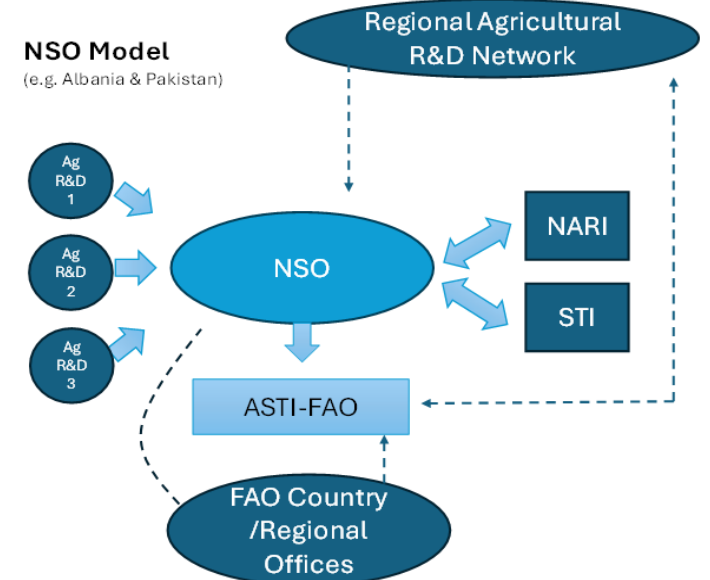
Revised Classic Model
(e.g. Nigeria, Argentina & Cote D'Ivoire)



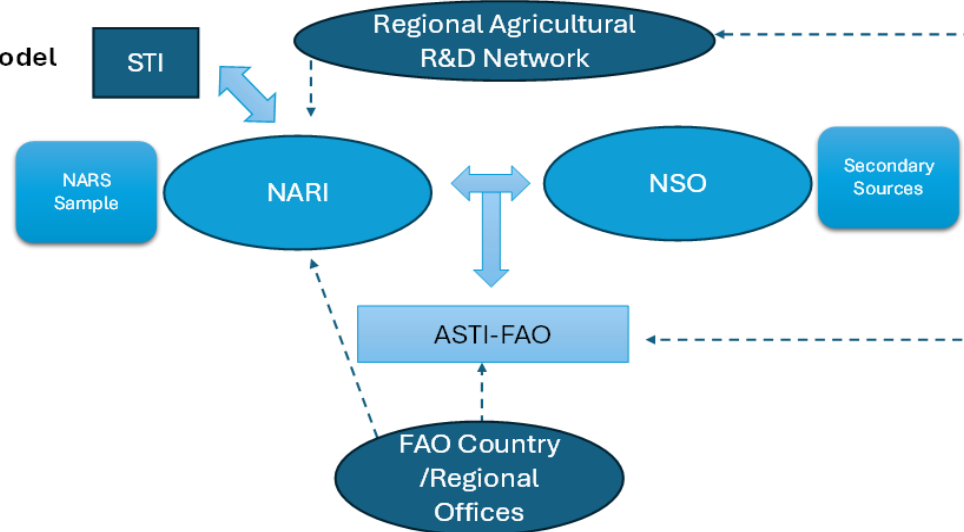
MoA Model
(e.g. Ecuador & Laos)



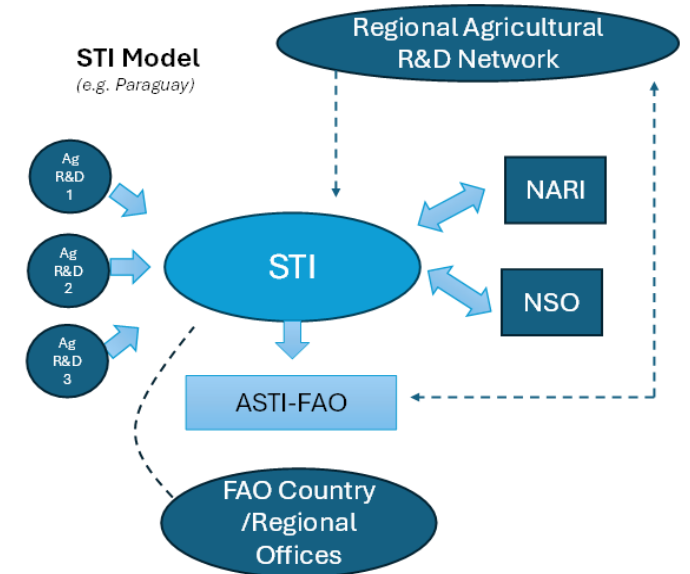
NSO Model
(e.g. Albania & Pakistan)



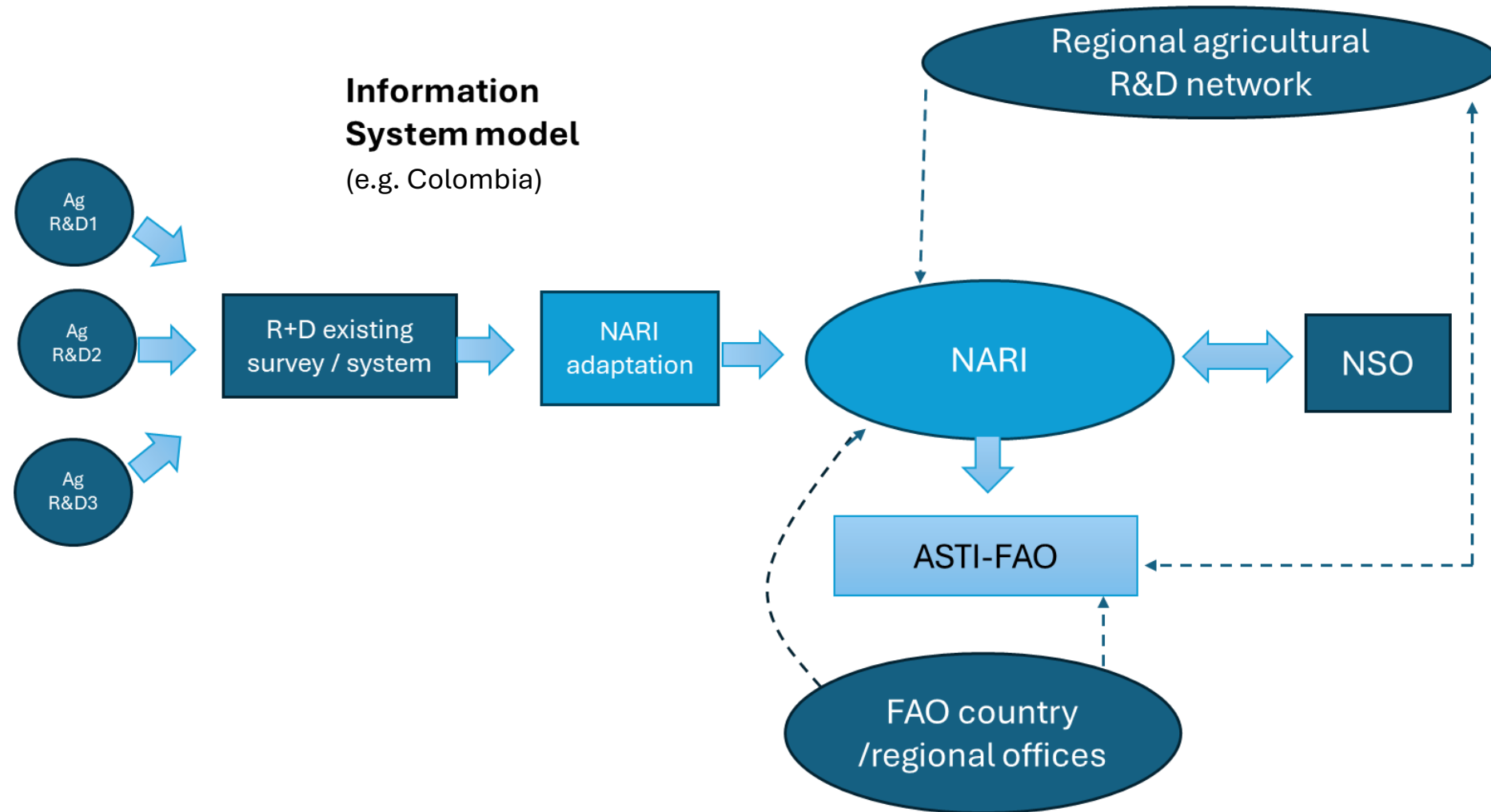
Hybrid Model
(e.g. Malaysia)



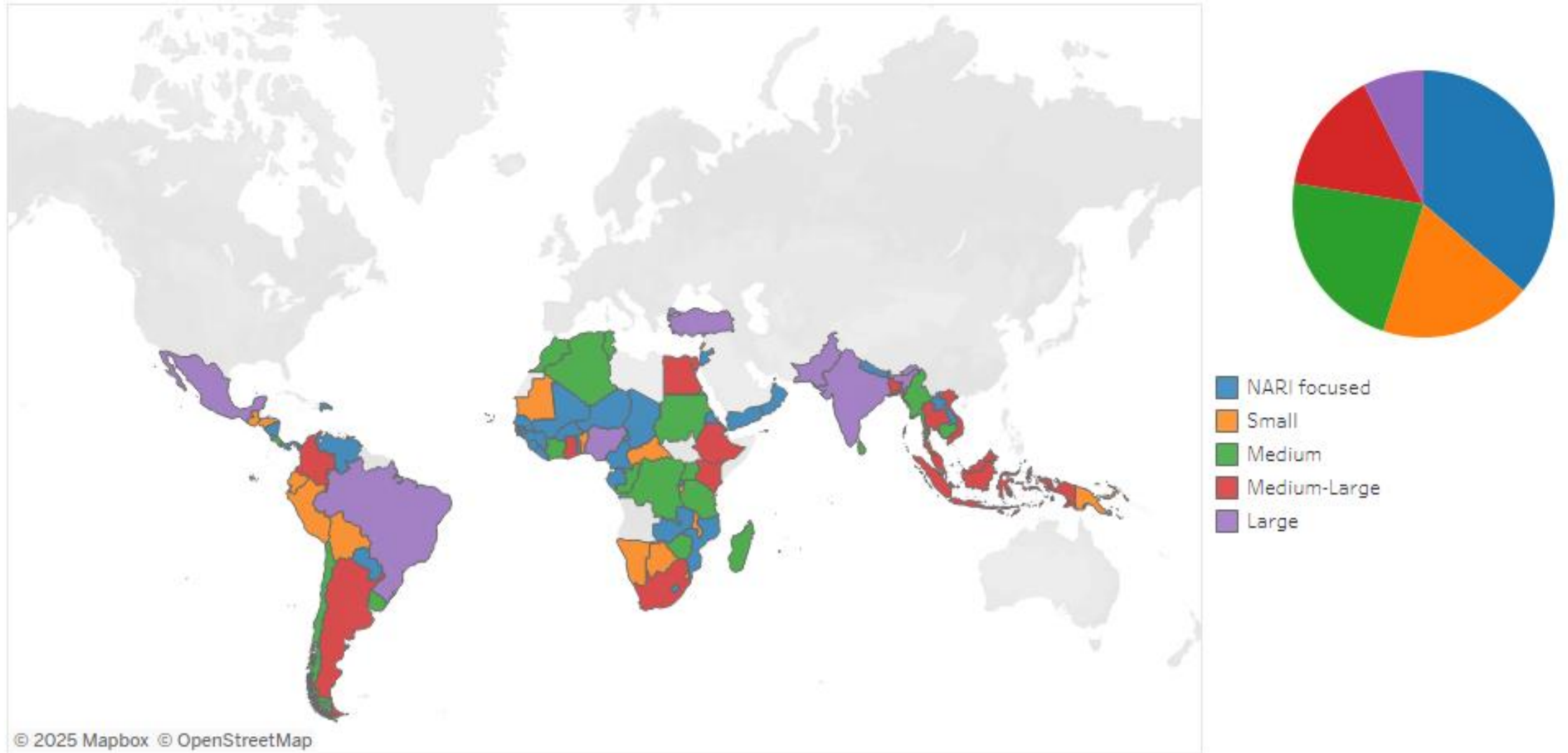
STI Model
(e.g. Paraguay)



Model for ASTI institutionalization



ASTI Countries by National Agricultural Research System size



Proposed approach to the in-country implementation

Rationalizing a differentiated data collection frequency

Tier 1: Core aggregates

Investments and human resource capacity variables will be collected through FAO questionnaires administered on an annual basis (i.e. total spending, total researchers)

These data will be disseminated through FAOSTAT

Tier 2: Detailed and granular variables

A comprehensive questionnaire could be distributed every 3-5 years to collect a more in-depth detailed indicators (e.g. gender, commodity focus, research outputs, qualitative data, etc.)

Structural data to be collected according to national needs

FAO questionnaire dispatched in July 25

Only Tier 1 indicators will be collected in the global roll-out

Tier 1:
Basic
aggregates

Main indicators:

- 1) Total agricultural research expenditure at constant prices.
- 2) Agricultural research expenditure as a percentage of the value added of agriculture, forestry and fisheries.
- 3) Total full-time equivalent agricultural researchers.
- 4) Full-time equivalent agricultural researchers per 100 000 farmers

These data will be disseminated through FAOSTAT

 Food and Agriculture Organization of the United Nations		FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS – STATISTICS DIVISION	
Questionnaire on Agricultural Science and Technology Indicators (ASTI)			
Name of country:		Country code:	
National reporting office and name of contact person			
Informant's name:		Mr./Mrs./etc.	
Informant's surname:		Title of post:	
Institution or office:		Division:	
Address:		Unit:	
Tel.:		Secondary email:	
Email:		URL	
Purpose of the questionnaire:	The information collected will illustrate trends and gaps in your country's agricultural research system, generate information for decision-making, and help establish agricultural research priorities that lead to increased income, improved food security and nutrition. Users of ASTI results include national ministries of agriculture and finance, regional and subregional research organizations and international institutions and donors.		
The questionnaire consists of 6 pages: Cover Instructions Definitions Data (2 sheets: HR-Researchers FTE; Financial resources FTE) Metadata			

Overview of definitions used to clarify the scope

General definitions for national agricultural R&D

- **Agricultural R&D (adopted by ASTI):**
 - Crops, livestock, forestry, fisheries, natural resources, and the socioeconomic aspects of primary agricultural production.
 - On-farm storage and processing of agricultural products.
 - *Excludes: off-farm postharvest and food processing research.*
- **National Research:**
 - Domestically targeted research activities funded or executed by (local) research agencies within a particular country.
 - *Research activities of international or bilateral research agencies that are not executed through national institutes are excluded, as well as research activities that are undertaken by short-term development projects.*
- **Calculation of 'Full-Time Equivalents' (FTEs) for Human Resource data**
 - ASTI collects human resource data in headcounts, and time-use data in percentages. The final data are presented in FTEs, which consider the proportion of actual time spent on agricultural research activities.

The scope is primary production: everything under the secondary (manufacturing) and tertiary (services) sectors is excluded. *R&D in the agrochemical industry, agricultural machinery, and the food processing industry off farm is not included in the current ASTI data (these belong to the secondary sector and are better reported under those industries).*

Also not included are the more discipline-oriented basic research activities undertaken by departments such as microbiology and zoology, except when this work has a clear focus on agriculture.

FAO questionnaire

Researchers

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS – STATISTICS DIVISION									
Questionnaire on Agricultural Science and Technology Indicators - DATA									
Researchers (FTE)									
Note: For the purposes of this survey, research personnel include persons in a research position (including long-term advisers) that hold at least a bachelor's degree or equivalent diploma (i.e. at least three but usually four years of full-time university studies). Managers, such as directors, deputies and heads of research programs, are also considered research personnel. Only active staff should be included (i.e. excluding staff on long-term unpaid leave and approved but vacant posts). Values should be expressed in full-time equivalent (FTE). If the equivalence of diplomas is not clear, apply the following educational scale: A doctorate (Ph.D.) is equivalent to more than 6 years of full-time university studies, including a doctoral thesis. A master's degree (M.Sc.) is equivalent to 5-6 years of full-time university studies. A bachelor's degree (B.Sc.) is equivalent to at least 3 (but generally 4) years of full-time university studies. Data input instructions: - For each year, enter the data in the corresponding orange cells. Do not delete or insert rows or columns into any of the sheets, and do not write in cells that are not marked in orange. - An absolute zero or rounded zero, enter the number "0" in the corresponding cell. - Missing data (this means that data exists but is not reported for various reasons, excluding the confidentiality for which "C" should be indicated), enter "NA" in the corresponding cell. - Data that are not applicable, are not considered relevant Enter "NP" in the corresponding cell.									
Researchers according to the highest educational level attained and gender (expressed in FTE)	Select the most recent year for which data are available						2024		
	Type of organization								Total
	Government sector (GOV)		Higher education sector (HE)		Private non-profit sector (PNP)		Business enterprise sector (BE)		
	Female	Male	Female	Male	Female	Male	Female	Male	
	Doctoral degree (Ph.D.)								
Master's degree (M.Sc.)									0
Bachelor's degree (B.Sc.)									0
Sub-total	0	0	0	0	0	0	0	0	0
2024	0		0		0		0		0
2023									0
2022									0

FAO questionnaire

Expenditures

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS – STATISTICS DIVISION					
Questionnaire on Agricultural Science and Technology Indicators (ASTI) - DATA					
Expenditure FTE					
Expenditures should include government and other revenue sources (credit from development banks, bilateral and multilateral donors, product taxes, sale of goods and services, etc.). Indicate actual expenditures, not budgeted or projected expenditures for the following categories. Salaries include staff pay expenses such as salaries, pension contributions, insurance premiums, child education allowances and housing. The labor cost of temporary staff such as day laborers or long-term advisers should also be included. Programme and operating expenses include costs such as petrol, electricity, office supplies, books, agricultural inputs, etc. staff training, travel, daily subsistence allowance and also running costs and maintenance of buildings, vehicles and equipment. Capital expenditure refers to the acquisition or lease of items of more than one year's duration. Examples include research teams, furniture, computers, vehicles, land and buildings, as well as depreciation costs (and interest) of past capital investments. Values should be expressed in full-time equivalent (FTE) Data input instructions: - For each year, enter the data in the corresponding orange cells. Do not delete or insert rows or columns into any of the sheets, and do not write in cells that are not marked in orange. - An absolute zero or rounded zero, enter the number "0" in the corresponding cell. - Missing data (this means that data exists but is not reported for various reasons, excluding the confidentiality for which "C" should be indicated), enter "NA" in the corresponding cell. - Data that are not applicable, are not considered relevant Enter "NP" in the corresponding cell.					
Currency used for data reporting:					
Units of monetary measure:					
Date ending the financial year:					
Total expenditure by cost category (<u>expressed in FTE</u>)	Select the most recent year for which data are available				2024
	Types of organization				Total
	Government sector (GOV)	Higher education sector (HE)	Private non-profit sector (PNP)	Business enterprise sector (BE)	
Labour costs of R&D personnel					0
Other current R&D costs					0
Capital R&D expenditures					0
2024	0	0	0	0	0
2023					0
2022					0

Implications for countries with R&D survey data

Harmonized data is needed for building the FAO agricultural R&D global data set

- Ag R&D has been collected by different organizations (i.e. IFPRI, Eurostat and OECD) and through different statistical operations (i.e. National R&D surveys, ASTI surveys and admin data)
- The data collected by R&D surveys may not fully inform the FAO-ASTI dataset due to missing ag-specific variables
- FAO will request aggregate data by institutional sector. ASTI data is often available only for GOV and HES
- The main challenge to be addressed may be that the socio-economic objective (SEO) in agriculture in national R&D surveys is not disclosed by number of researchers, and expenditures in certain institutional sectors
- ASTI variables could be derived by processing national R&D surveys including only the units that reported ag-SEO
- Estimations could be done by the data holder without affecting confidentiality or by FAO through a data sharing agreements
- Unit-level data will not be requested, but the list of agencies to feed the ASTI directory

The ASTI Community of Practice (online)

To facilitate and enhance knowledge sharing and peer exchange among countries globally.

 Global Community of National ASTI Focal Points

[Home](#) [Discussions](#) [Library](#) [Calendar](#) [Members](#) [Admin](#)

Global community of National ASTI Focal Points

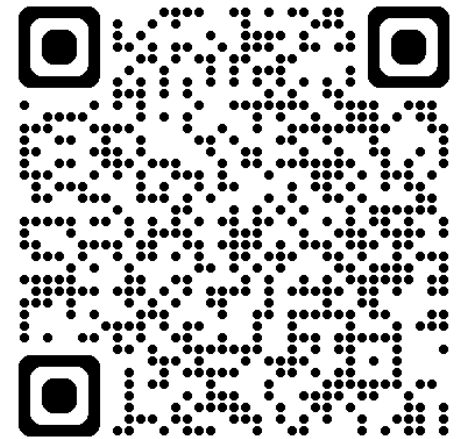


The ASTI Network bridges the data-to-impact gap by providing data, analyses, and outreach to inform policy and investment decisions in agricultural research



This discussion space is only for the Community of ASTI National Focal Points from the countries undergoing ASTI data collection to share their experiences and insights gained on the implementation of ASTI data collection in their country as well as challenges and questions.

Click on Discussions to read or post.
Click on Library to access the available resources.



Scan or [click](#) to join us

<https://dgroups.org/fao/asti/asti-fp/join>

THANK YOU!

