Food and Agriculture Organization
of the United Nations

New approaches for long-term sustainability of the ASTI program

Hernán D. Muñoz – FAO Statistics Division

AARINENA- FAO webinar, 3 September 2024

Webinar objectives

- Introduce the ASTI program and its new operational mechanisms
- Discuss strategies to enhance the long-term institutionalization of ASTI and to maximize policy uptake of ASTI outputs at the national level
- Initiate interinstitutional dialogs to build a common understanding of roles and responsibilities in the new approach
- Review the ASTI methodology and existing STI data collected by NENA countries
- Discuss and collectively formulate a way forward for implementation

What is ASTI?

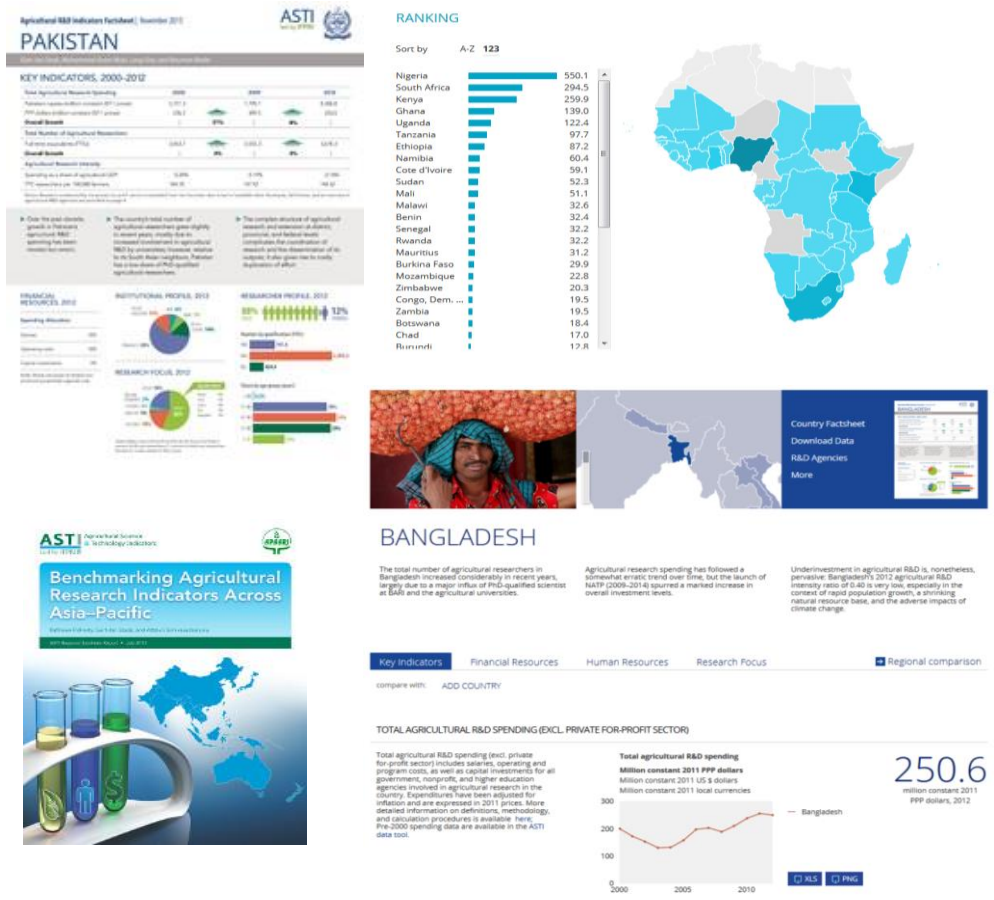
A global reference on agriculture R&D investments and capacity of NARS

The Agricultural Science and Technology Indicators (ASTI) collects institutional investment, human resource, and research output data from agricultural R&D agencies in developing countries worldwide

Why ASTI: quantitative data are essential for stakeholders 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

ASTI Data



ASTI indicators

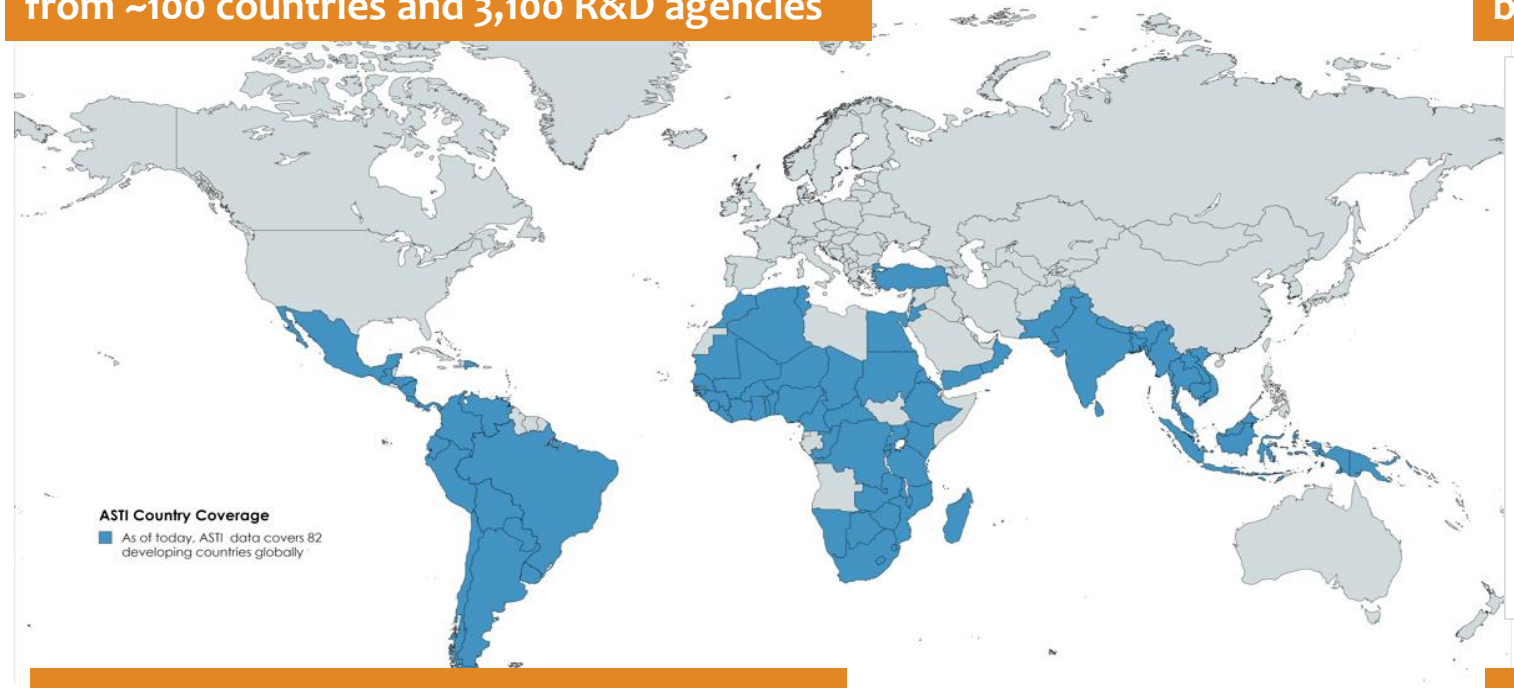
- Institutional arrangements
- R&D spending by cost category
- Funding sources
- R&D staff by degree, gender, and age
- R&D focus by commodity and theme
- Output indicators

Outputs

- Country factsheets
- Regional and global synthesis reports
- Online datasets and tools (www.asti.cgiar.org)

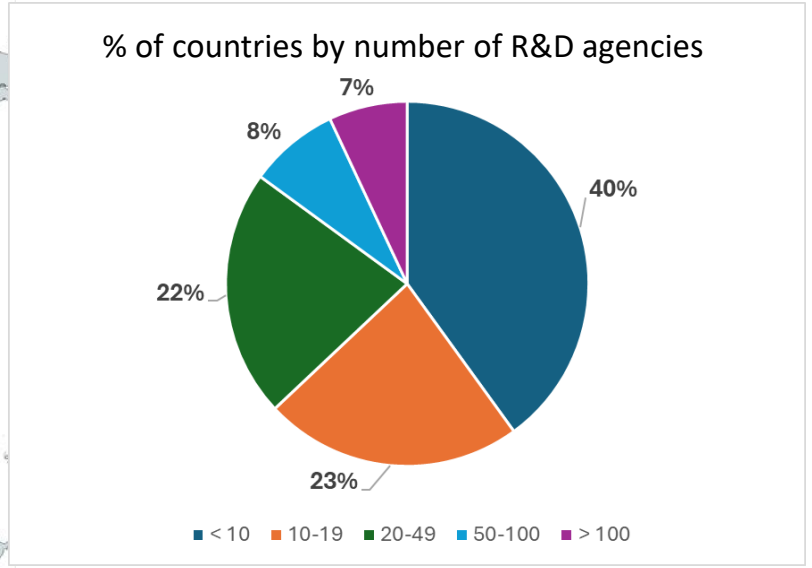
ASTI Country Coverage

Between 1981 and 2018, ASTI collected data from ~100 countries and 3,100 R&D agencies



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

Data are available at R&D agency level and by institutional sector



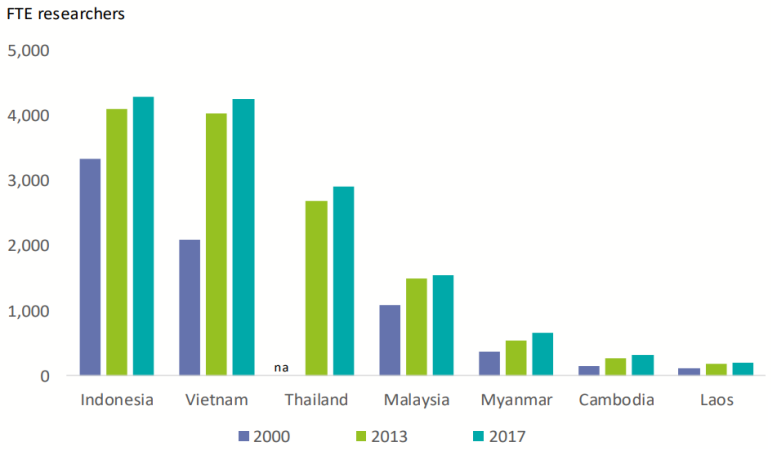
More than 60% of NARS have fewer than 20 agencies.

Users of ASTI

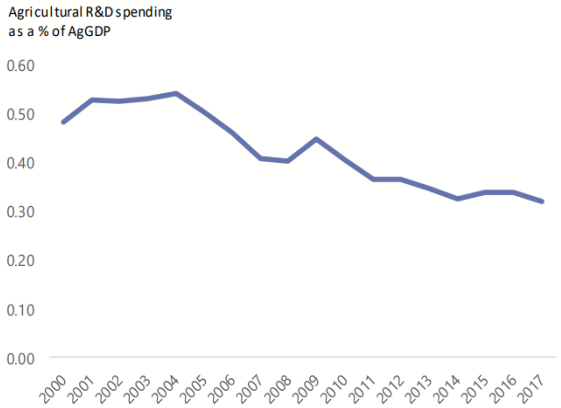
Uses of ASTI – Global/Regional/National perspectives

I. Characterization of Agricultural Research Human Capital
II. Trends in Investment in Agricultural Research
III. Global R&D agencies directory

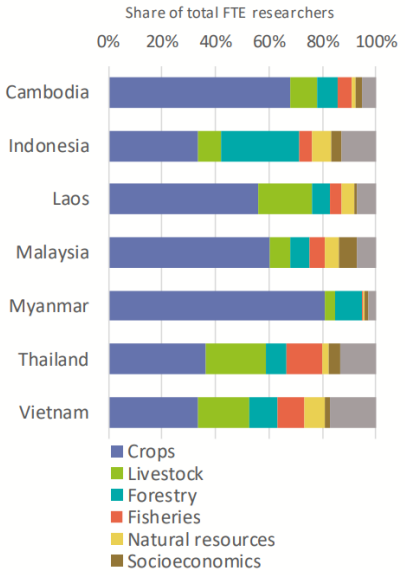
FTE agricultural researchers by country, 2000, 2013, and 2017



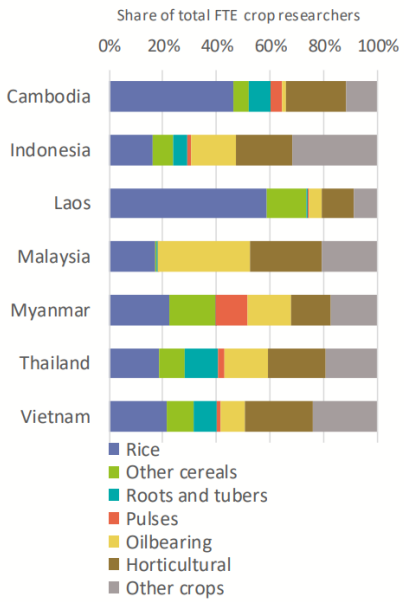
Agricultural research spending as a share of agricultural GDP, 2000–2017



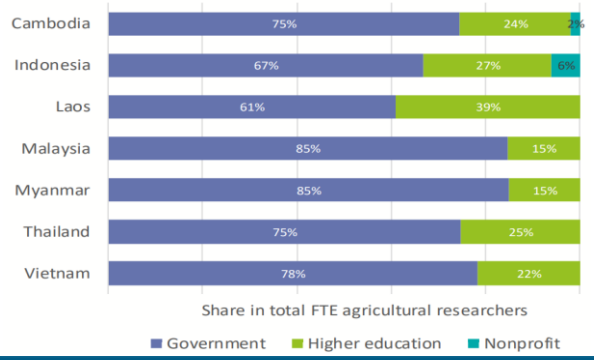
Research focus by commodity group, 2017



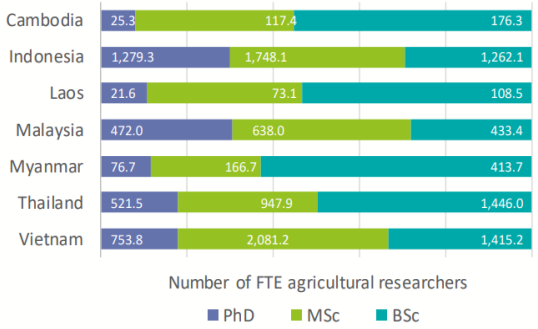
Research focus by crop category, 2017



Institutional composition of agricultural R&D, 2017

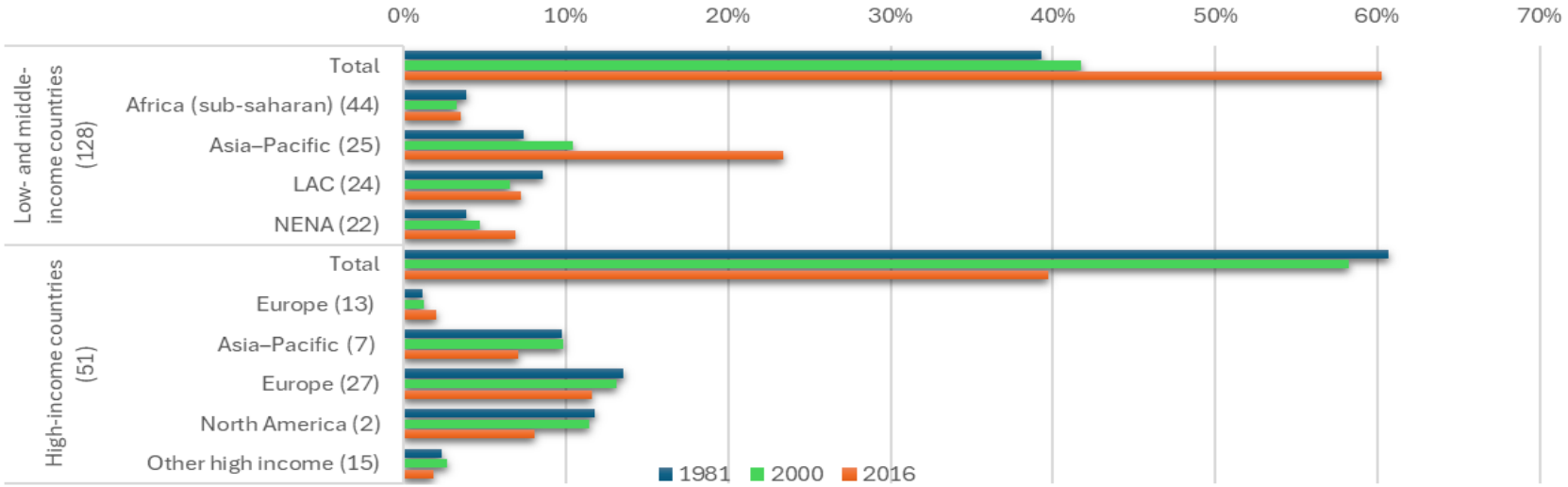


Distribution of agricultural researchers by degree, 2017

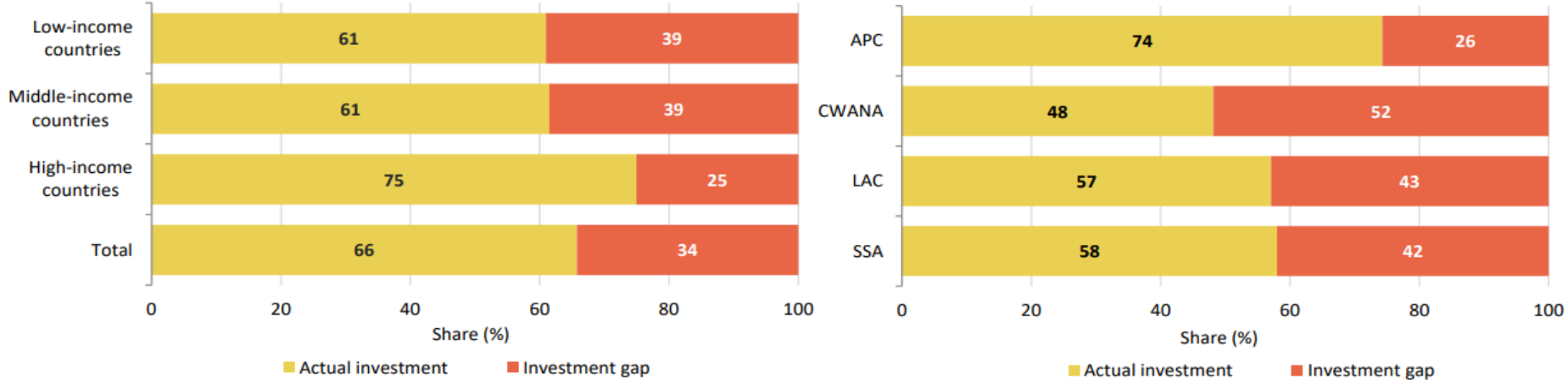


Uses of ASTI – Regional analysis

Share by region and income level in global agricultural R&D expenditure (1981, 2000 & 2016)

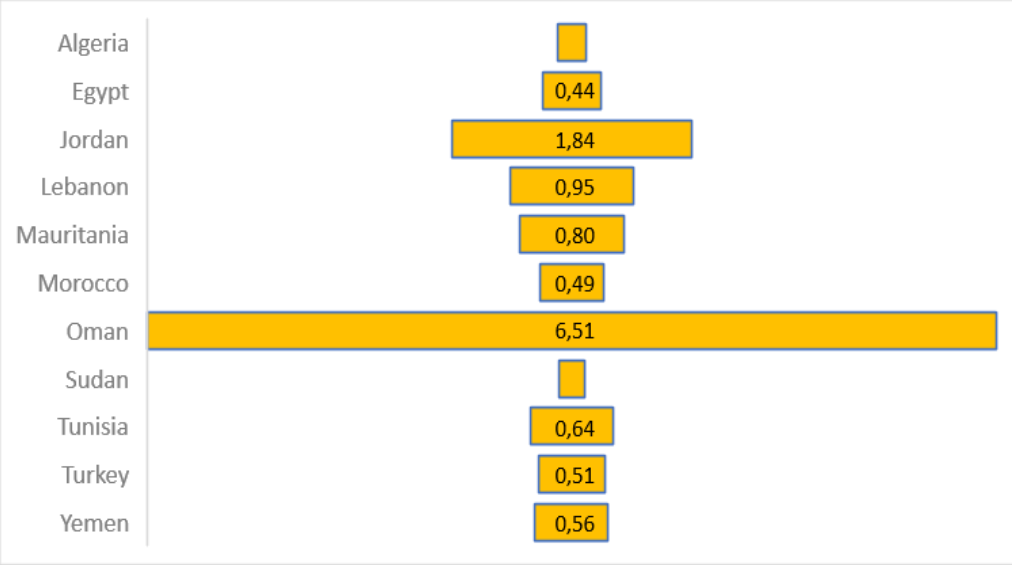


Agricultural research investment gap by income level and region (2016)

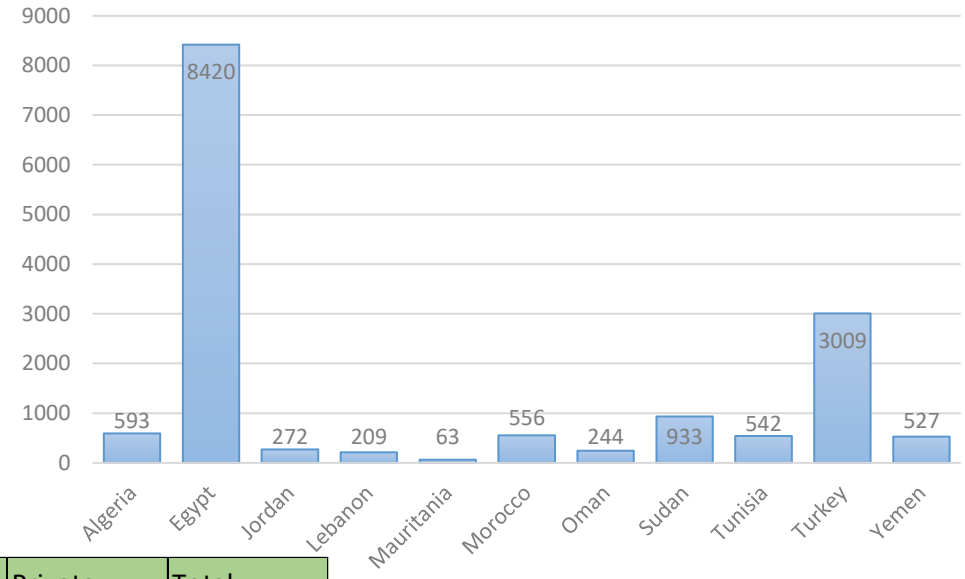


Uses of ASTI – NENA region (2012)

Spending as a share of AgGDP (%)



Total FTE researchers



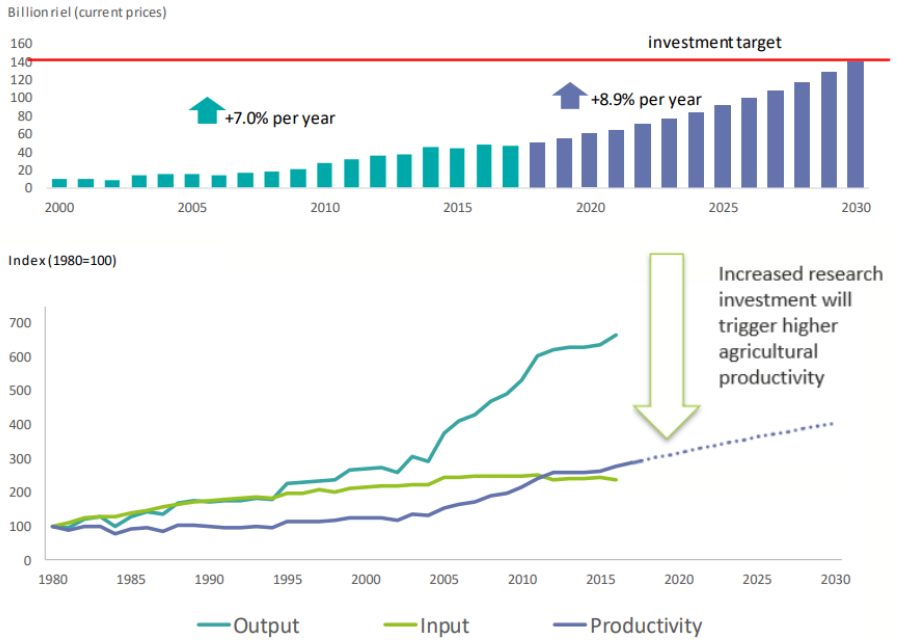
Number of ASTI R&D agencies by country and institutional sector

Country	Government	Higher education	Private	Total
Algeria	15	7	0	**22**
Egypt	29	21	na	**50**
Jordan	2	7	4	**13**
Lebanon	2	4	0	**6**
Mauritania	4	3	1	**8**
Morocco	5	14	0	**19**
Oman	3	1	0	**4**
Sudan	4	28	0	**32**
Tunisia	12	10	0	**22**
Turkey	44	43	35	**122**
Yemen	2	5	0	**7**

Uses of ASTI – National/Sectoral/Institutional perspectives

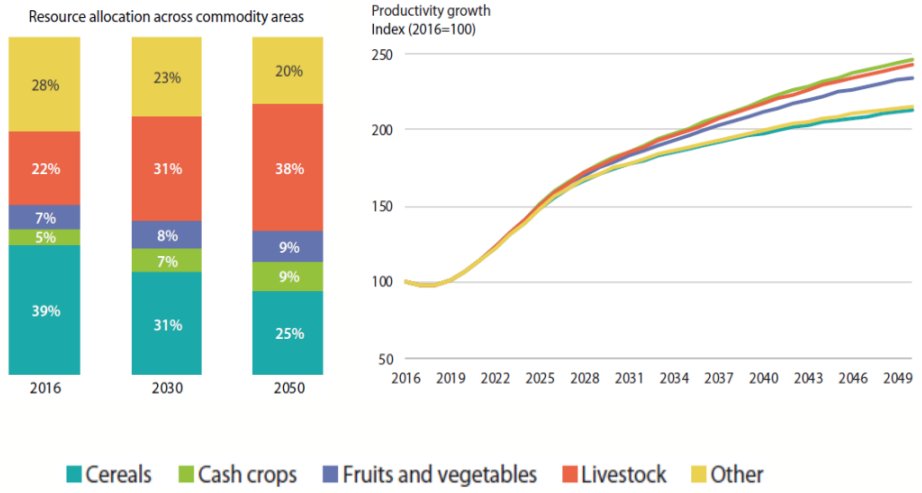
Advanced analysis & informing policy options

Projected annual R&D spending and productivity growth, 2017–2030



Closing the gap in investment in Agricultural Research will drive future productivity growth

Agricultural productivity projections for selected commodity groups based on attainable rates of research investment, 2016-2050

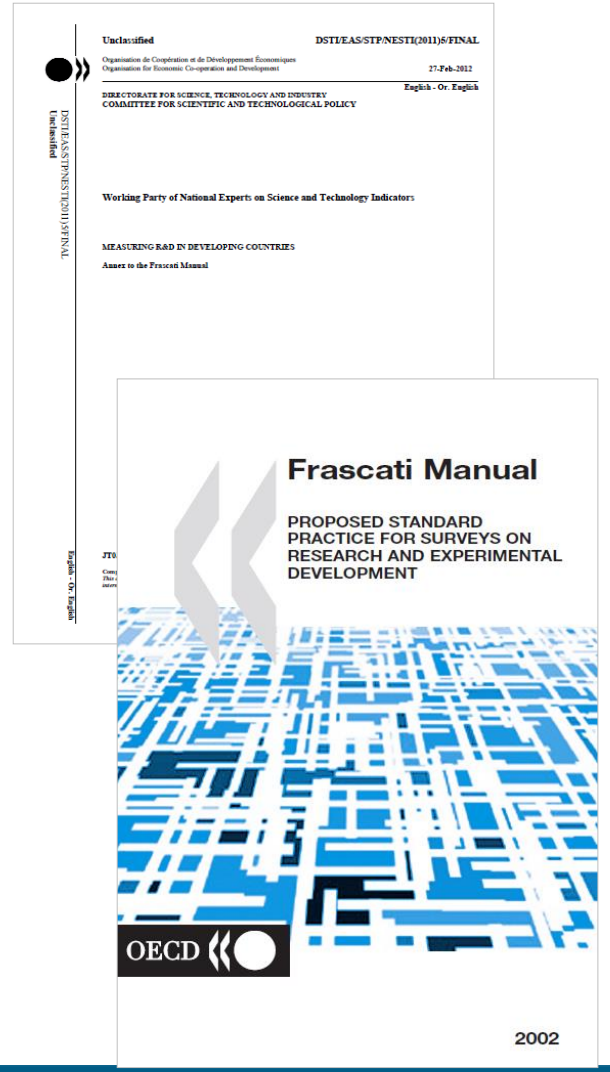


Productivity growth under alternative investment scenarios

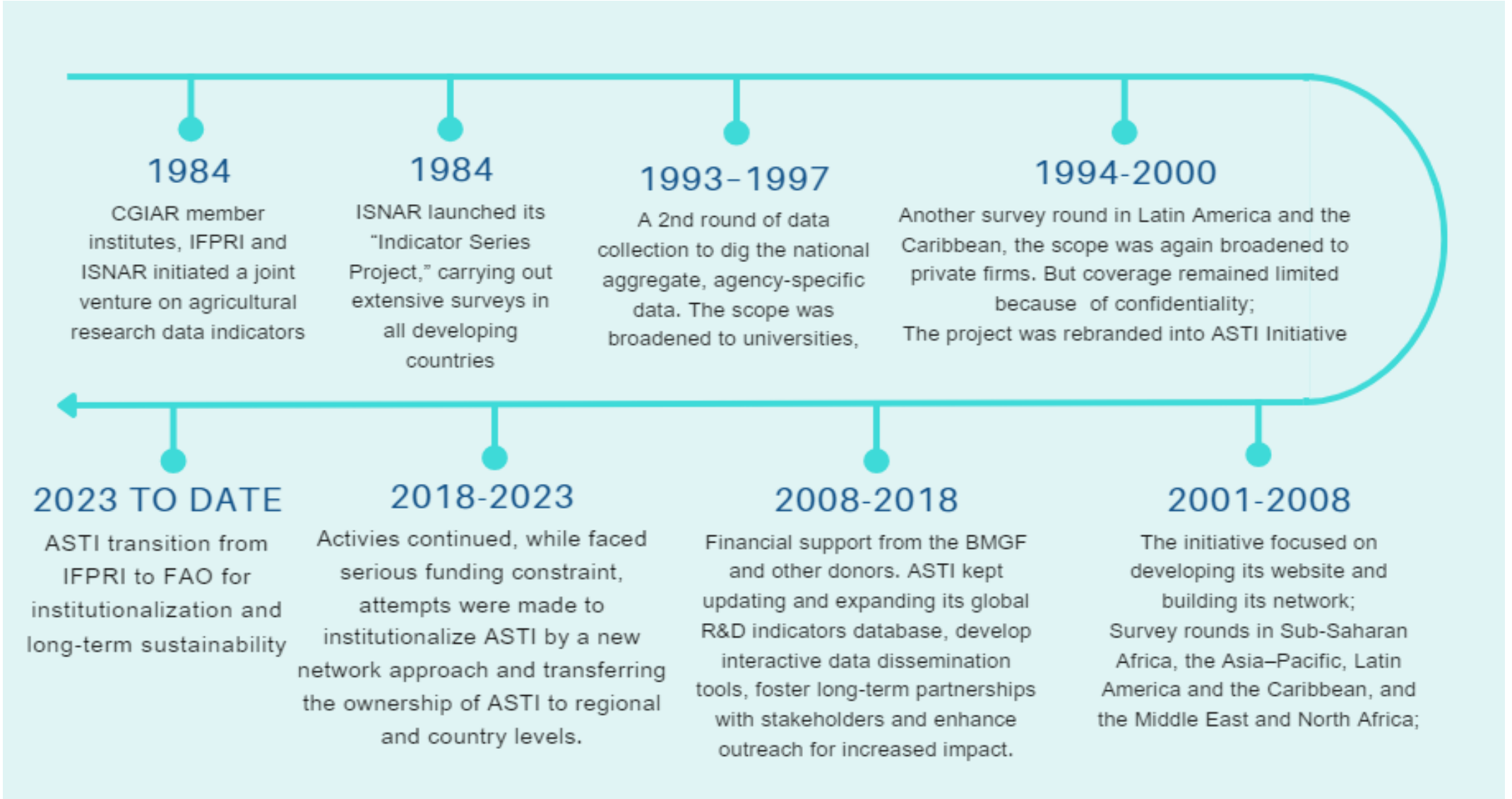
Introduction to ASTI survey history and implementation methodology

Historical origins of the ASTI survey

- The ASTI surveys were initiated by IFPRI in response to the gap between research data availability in the Organization for Economic Co-operation and Development (OECD) countries and most of the developing economies in the Global South
- The methodology of the ASTI survey aligns with the Frascati Manual developed by the OECD and partners, which ensures compatibility of the data over time.
- The scope of ASTI is agricultural research and experimental development (R&D): "*Creative and systematic work undertaken in order to increase the stock of knowledge [...] and to devise new applications of available knowledge*"
- 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.



ASTI Initiative: Past & Present



ASTI
facilitated by IFPRI

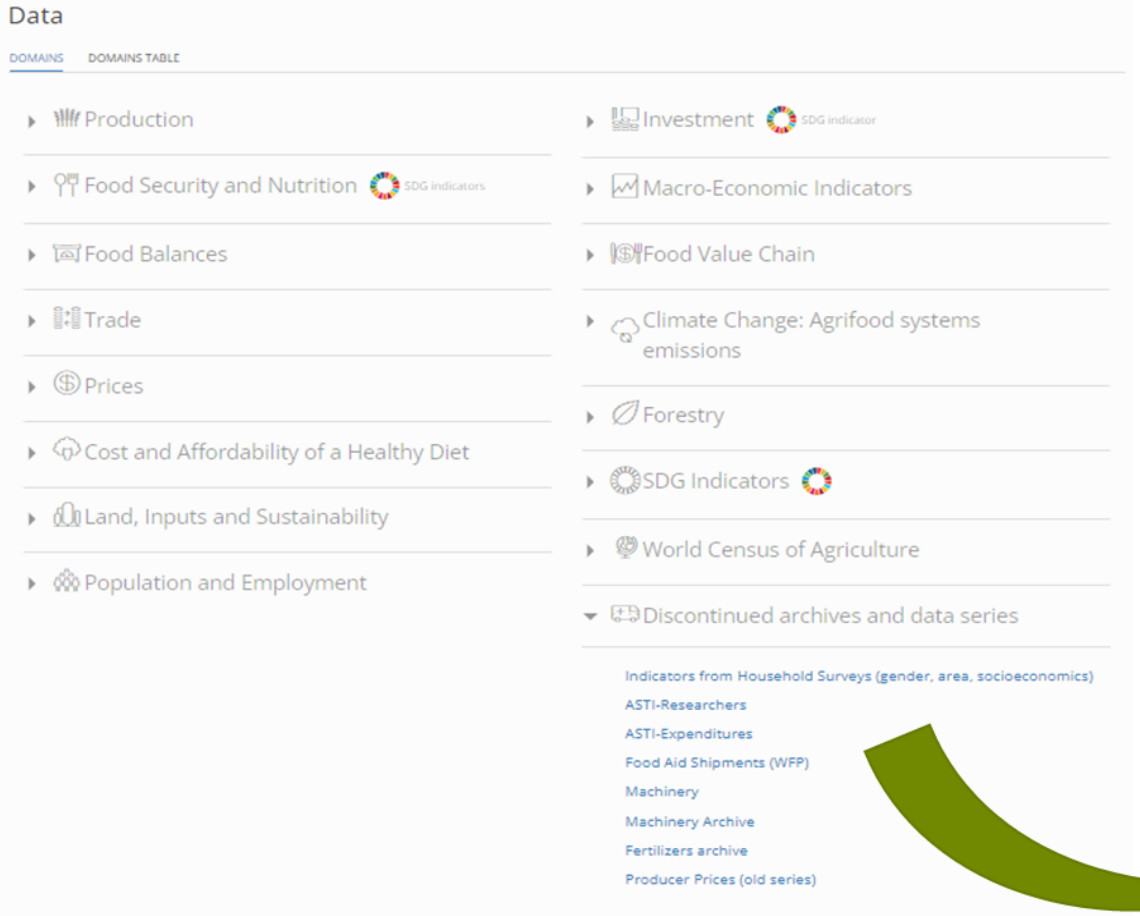
About | Data/tools | Countries/regions | Resources | Analysis | Policy outreach/uptake | Fr | Es

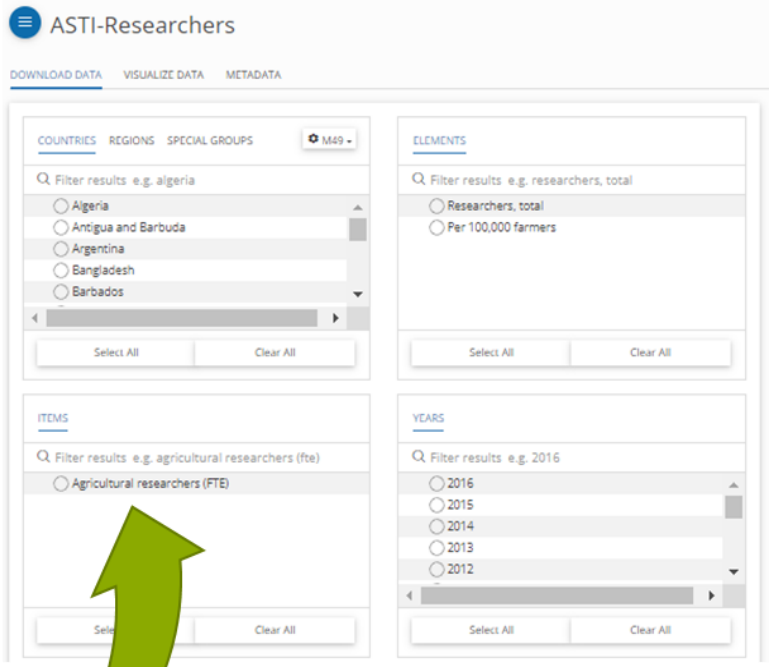
The ASTI Network bridges the data-to-impact gap by providing data, analyses, and outreach to inform policy and investment decisions in agricultural research.

ASTI is moving from IFPRI to FAO

ASTI is pleased to announce that its program will be transitioning to FAO. This move marks a significant milestone in ensuring the long-term continuity of ASTI's valuable agricultural research data. As part of FAO's broader Agrifood Systems Technologies and Innovations Outlook, ASTI will continue to provide its data and analysis while also expanding its focus to include a broader set of data on R&D for agrifood systems. During the transition process, the existing ASTI website will remain fully functional, ensuring uninterrupted access to data and publications. We are grateful for your sustained support of ASTI over the years and excited to embark on this new journey with FAO. Stay tuned for updates on our progress!

FAOSTAT: ASTI data series are discontinued





Current implementation and use of ASTI data

ASTI data collection challenges…

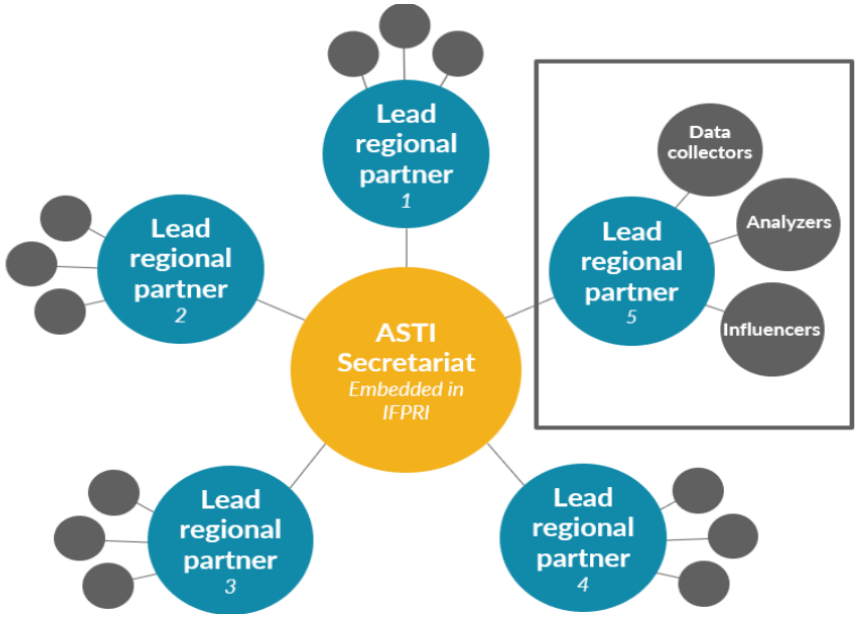
- Reliance on project-based funding
- Lack of a clear mandate for data-collecting agencies
- Non-official status of data for UN organizations
- Low frequency of data release
- Reduced use in the country
- Excessive burden on data providers
- Data incompleteness and consistency risks

Pathway towards sustainability of ASTI

Timeline of the ASTI transition process & milestones

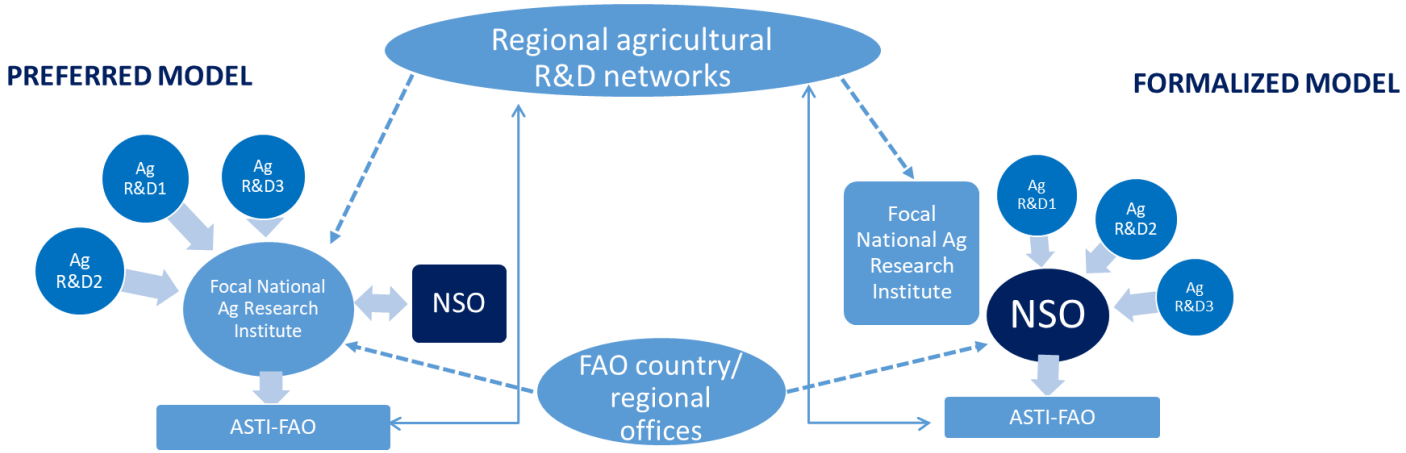
- **2023:**
  - Comprehensive assessment of the ASTI program
  - Roadmap for the integration of ASTI into FAO
- **2024:**
  - Implementing the new ASTI data collection approach in selected countries
  - Review of the implementation process outcomes to formulate recommendations
  - Institutionalization of ASTI at the national and global level
    - Capacity building regional workshops (RLC, RAF, RAP, RNE)
    - UN Statistical Commission and Regional Commissions on Ag Statistics
- **2025:**
  - Global rollout: regular annual data collection round across all FAO members through formal National Statistical System mechanisms and FAO questionnaire
  - Dedicated in-country capacity building and community of practice on ASTI

ASTI new data collection approach



Previous model

New operational model: tailored to country-specific context



FAO ASTI TEAM COORDINATES MULTI-STAKEHOLDER INVOLVEMENT

Revised model(s) 2024

Proposed approach to the implementation of ASTI

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

Action Plan

Operational Mechanisms: Actions, Tasks and Outcomes

Data Products

- Revisit scope
- Increase country coverage
- Improve private sector data collection
- Regular frequency of data
- Increased relevance

New Data Collection Approach

- Integrate ASTI data collection into NSS mechanisms
- Pilots in 11 countries
- Capacity building
- First global roll out in 2025
- Global institutionalization

Institutionalization of ASTI

At global level:

- Institutionalization through UN system mechanisms
- Integration in FAOSTAT and STI Platform

At national level:

- Regular data collection through official mechanisms
- Building capacities and promote country uptake

Institutionalization of ASTI

Regional Level

AFRICAN COMMISSION ON AGRICULTURAL STATISTICS - 28th Session / 4-8 Dec 23

ASIAN PACIFIC COMMISSION ON AGRICULTURAL STATISTICS – 30TH Session / 19-24 May 24

Decisions adopted by member countries refer to:

- *Recognize the importance of data on science, technology and innovation for guiding policies that aim to enhance agricultural productivity and, therefore, poverty reduction and hunger eradication. However, it also recognizes the scarcity of these data and the need to improve its collection and to systematize the dissemination of quality, official and country owned indicators.*
- *Acknowledge the ongoing transition towards a more institutionalized and sustainable Agricultural Science and Technology Indicators (ASTI) program in FAO and takes note that FAO will be seeking opportunities to pilot new data collection approaches in selected countries in the region.*
- *Commend member countries to support ASTI activities in the region and encourages FAO to conduct specialized capacity building activities with the national institutions that produce agricultural statistics.*
- *Recommend the integration of the National Agricultural Research Institutes (NARIs) into the National Statistical Systems.*
- *Encourage member countries to initiate national dialogues to establish fit-for-purpose data collection models for ASTI data.*

Institutionalization of ASTI

National level

- The National Statistical System (NSS) is led by the National Statistical Office (NSO). Different national agencies form part of the NSS and are mandated and responsible for collection of data.
- The formalization of reporting of ASTI data facilitates the inclusion of datasets in FAOSTAT, as FAO prioritizes the use of official data.
- FAO has already initiated the process of engaging with regional and national organizations to sensitize them on the upcoming process of incorporating parts of the ASTI data collection process under the NSS.
- The next phase in this process is to engage with the partners of the NSS to consider the inclusion of the National Agricultural Research Institutions so that they can facilitate the collection of data from the NARS institutions.
- The involvement of the NSO may also facilitate the collection of data from private sector organizations.

Country implementation

Objectives and outcomes

1. Implement strategies that positively **impact response rate and time** to data

2. **Institutional arrangements** to validate data and institutionalize ASTI at the national level

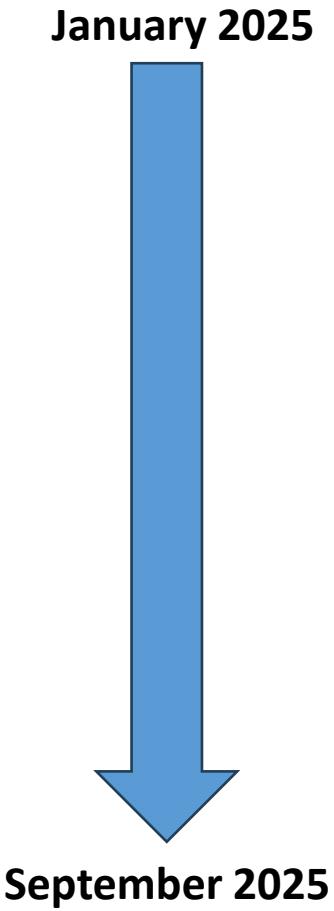
3. Integrate ASTI as an **official operation** into the country's statistical system (NSDS, Statplan, yearbook, NSS inventory, etc)

4. National **publication** of ASTI survey results and inclusion in the statistical release calendar

Design and development of the country workplan

Implementation steps

1. Institutional arrangements between relevant stakeholders
2. Review existing data and administrative records
3. Update and validate in-country agricultural R&D agency list
4. Contact the agencies through an official letter (FAO template available)
5. Collection of data
6. Follow-up with respondents
7. Send questionnaire evaluation form (ASTI questionnaire template available)
8. Data processing (ASTI data management portal available)
9. Review of the country file & quality assurance
10. Dissemination of results (Press release template available)



THANK YOU!