

AGRICULTURAL PUBLIC EXPENDITURES: ETHIOPIA, NIGERIA, TANZANIA, AND INDIA

COMPARISON OF INDICATORS ACROSS DATA SOURCES

**PIERRE BISCAYE, BEIJIE WANG, JACK KNAUER, C.
LEIGH ANDERSON, AND TRAVIS REYNOLDS**



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Methods

- > **Select indicators with data available from multiple sources in each country**
 - Indicator 1: budgeted public agricultural expenditure
 - Indicator 2: actual public agricultural expenditure
 - Indicator 3: percentage of total public expenditure on agriculture
 - Indicator 4: public agricultural research and development expenditure
- > **Convert data to 2011 constant USD if using different units within a country**
- > **Plot time series data from all sources reporting on overlapping years in each country**
 - If few data sources overlap, include available data sources for years available



Data Sources by Indicator and Country

Country	Indicator 1: Budgeted Spending	Indicator 2: Actual Spending	Indicator 3: Share of Total Spending	Indicator 4: R&D Spending
Ethiopia	MAFAP (2006-2013) PER (2000-2005)*	MAFAP (2006-2013) PER (2000-2005)* ReSAKSS (2000-2014)* SPEED (2000-2011)*	MAFAP (2006-2014) PER (2000-2005)* ReSAKSS (2000-2014)*	MAFAP (2006-2013) ASTI (1981-2014) FAOSTAT (2000-2011)
Nigeria	2008 PER (2001-2005)* 2014 PER (2008-2012)* Federal Appropriation Act (2009-2015)**	2008 PER (2001-2005)* 2014 PER (2008-2012)* ReSAKSS (2000-2013)* SPEED (2000-2012)*	2008 PER (2001-2005)* 2014 PER (2008-2012)* ReSAKSS (2000-2013)*	Federal Appropriation Act (2009-2015)** ASTI (1981-2014) FAOSTAT (2000-2011)
Tanzania	MAFAP (2007-2014) PEFA (2000-2006)* PER (2007-2011)*	FAOSTAT (2007-2014)* MAFAP (2007-2014) ReSAKSS (2007-2014)* SPEED (2007-2009)*	FAOSTAT (2007-2014)* MAFAP (2007-2014) PER (2007-2011)* ReSAKSS (2007-2014)* SPEED (2007-2009)*	MAFAP (2007-2014) ASTI (1996-2014) FAOSTAT (2000-2011)
India	Agriculture Statistics at a Glance (2007-2015)* Union Budget (2007-2015)*	Agriculture Statistics at a Glance (2007-2015)* FAOSTAT (2001-2013)* SPEED (2001-2011)* Union Budget (2001-2015)*	Agriculture Statistics at a Glance (2007-2014)* FAOSTAT (2001-2013)* SPEED (2001-2011)* Union Budget (2001-2014)*	Agriculture Statistics at a Glance (2007-2015)** Union Budget (2007-2015)** R&D Statistics (2011/2012) ASTI (1996-2014) FAOSTAT (2000-2009)

Descriptions of each data source are included at the end of the slide deck

* Converted data to a different unit than was originally provided

** Data not yet collected and included in the figures



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Indicator 1: Budgeted Public Agricultural Expenditure

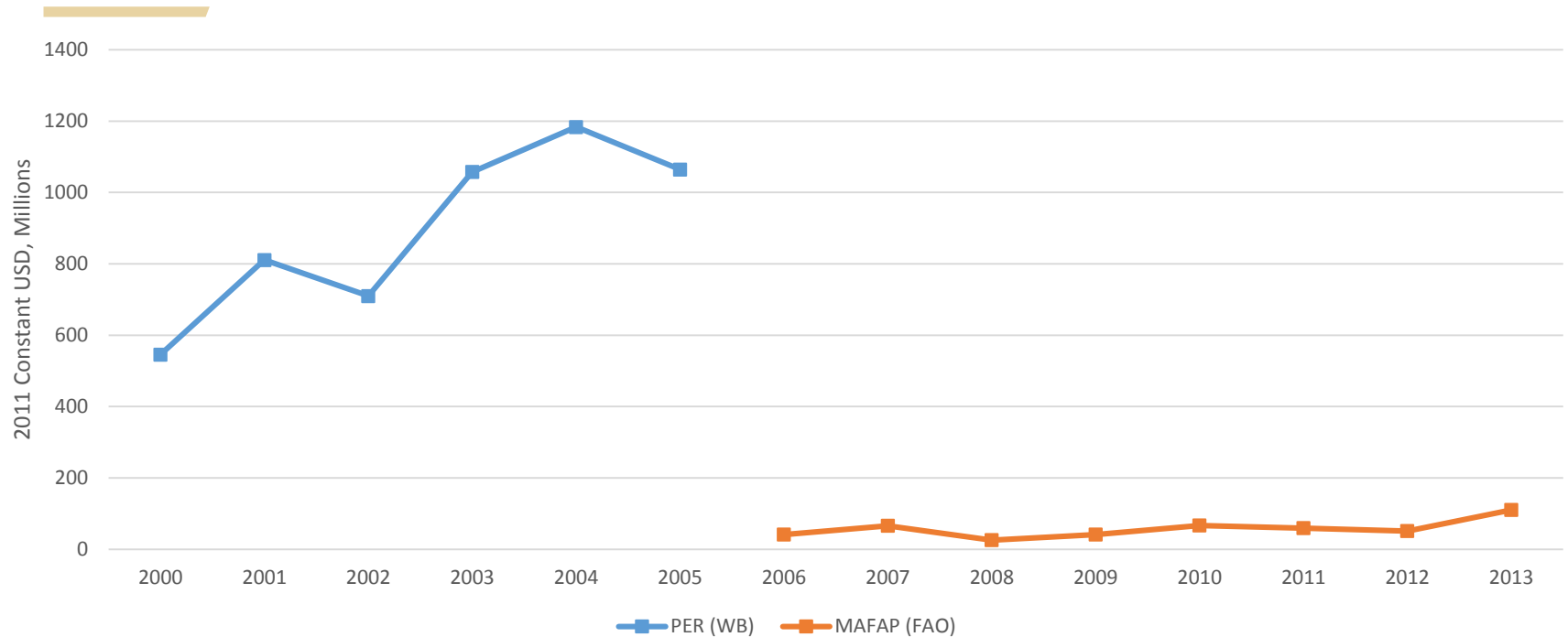


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Figure 1a: Budgeted public agricultural expenditure, Ethiopia



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Figure 1b: Budgeted public agricultural expenditure, Nigeria

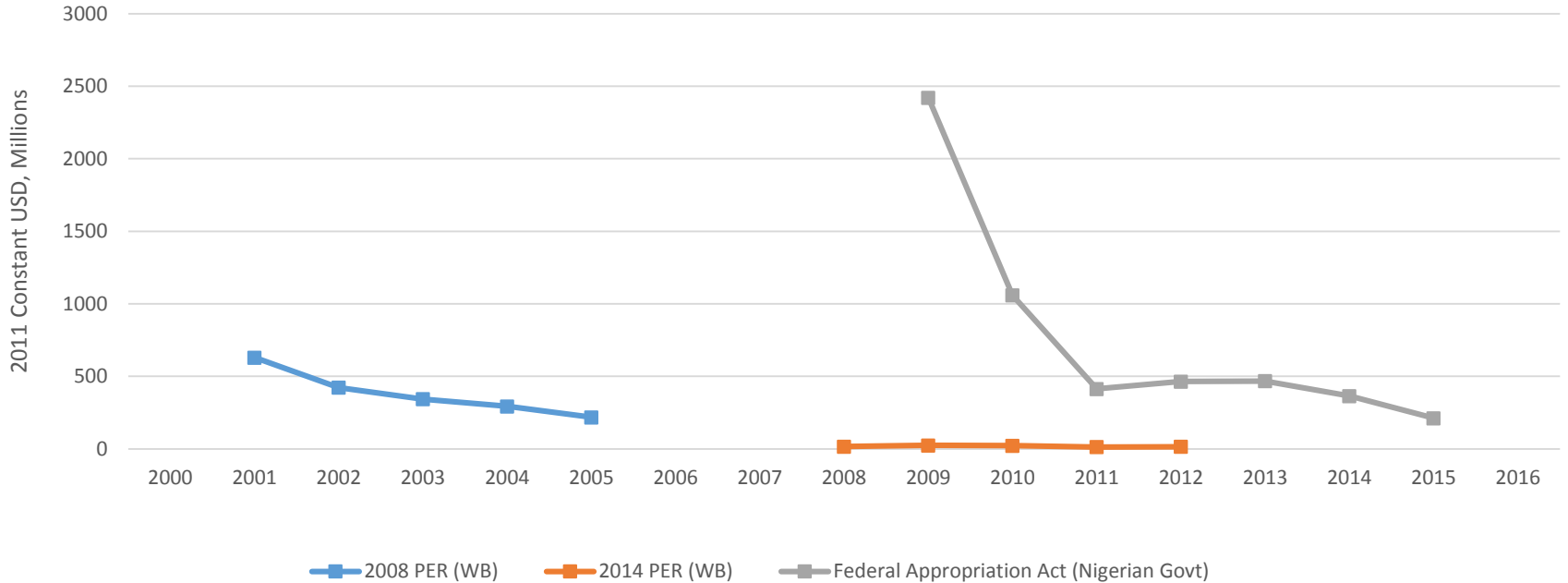
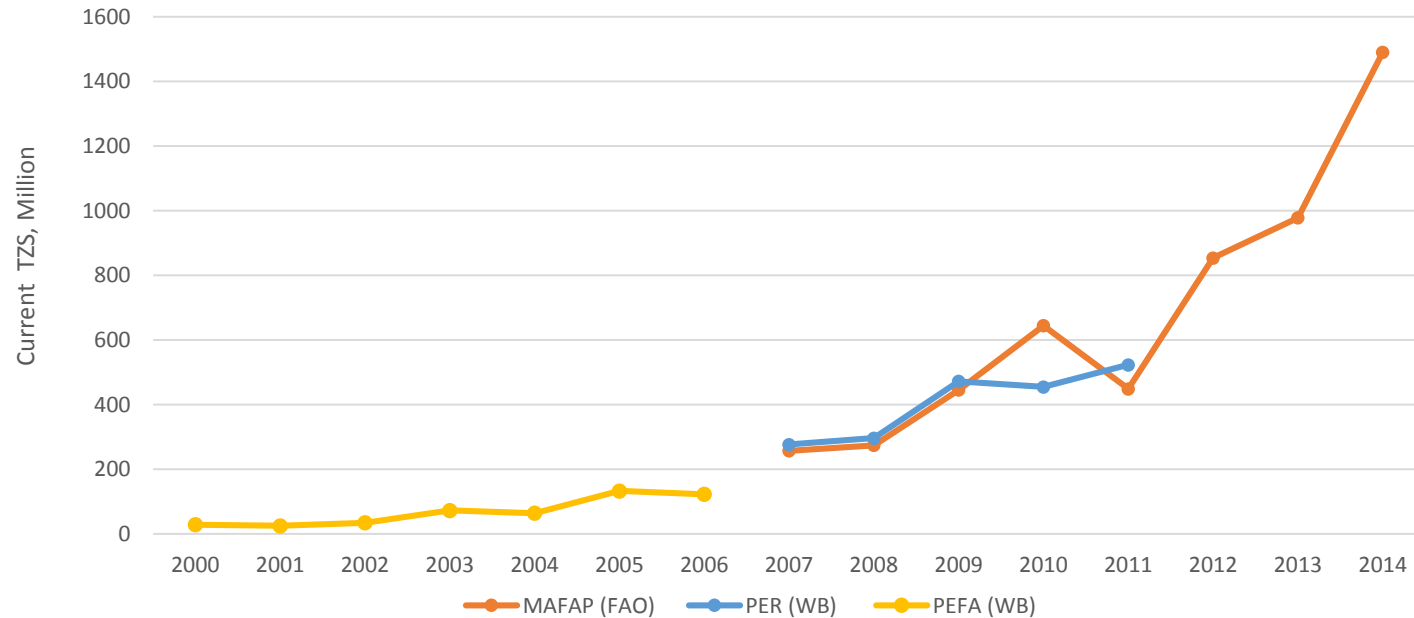


Figure 1c: Budgeted public agricultural expenditure, Tanzania

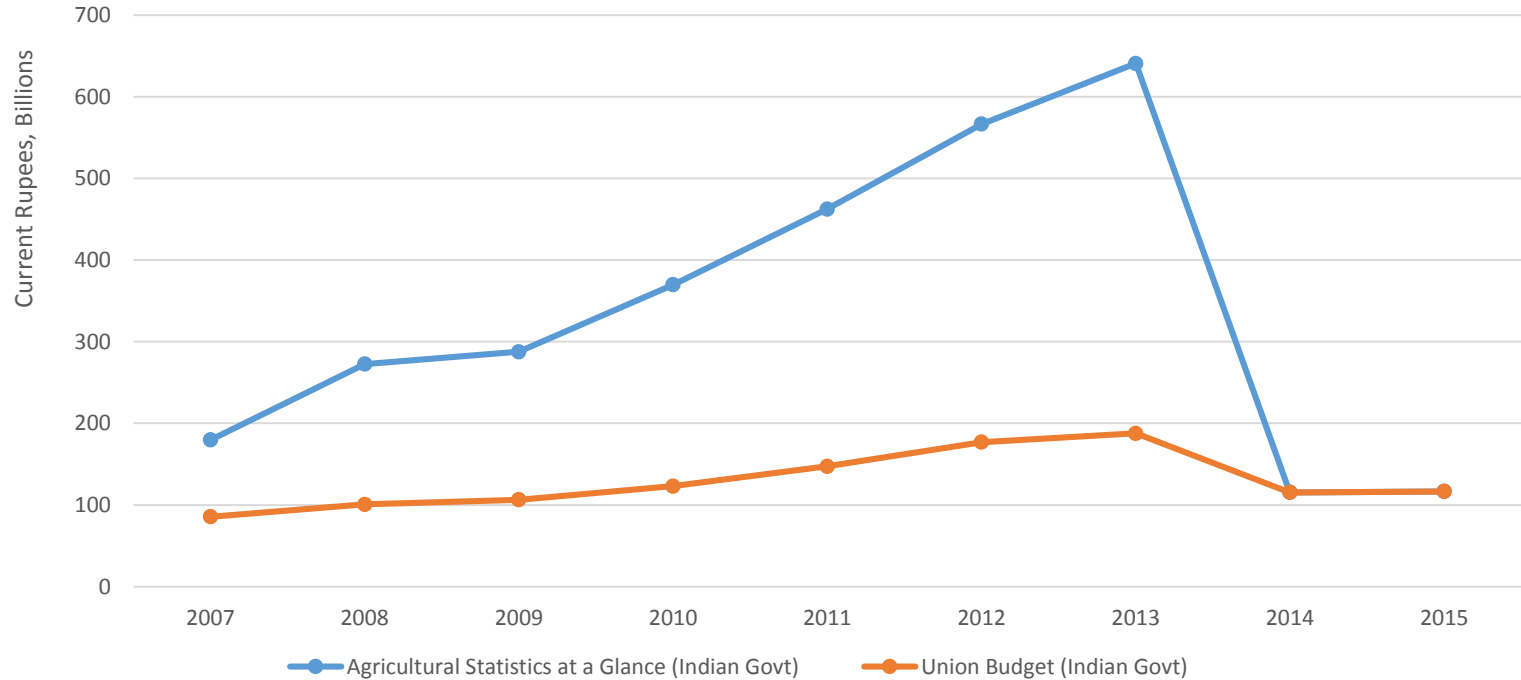


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Figure 1d: Budgeted public agricultural expenditure, India



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Indicator 2: Actual Public Agricultural Expenditure

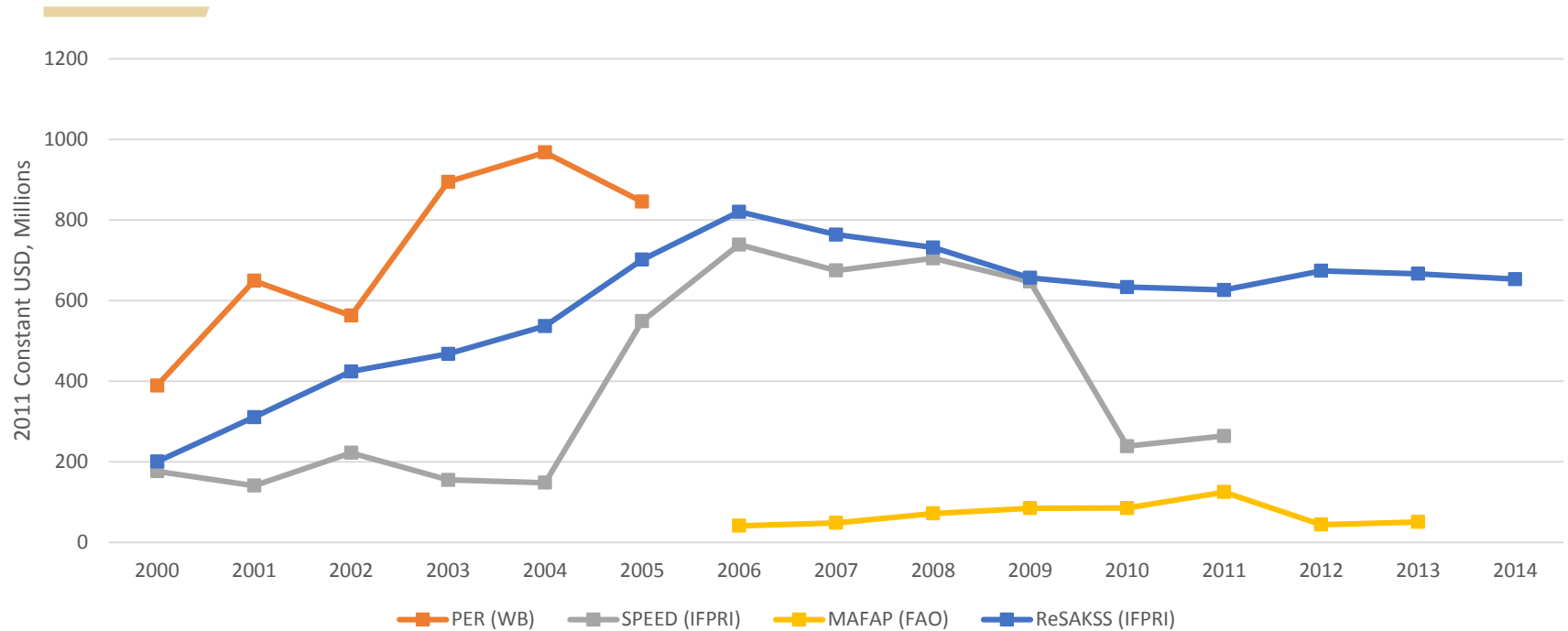


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Figure 2a: Actual public agricultural expenditure, Ethiopia



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Figure 2b: Actual public agricultural expenditure, Nigeria

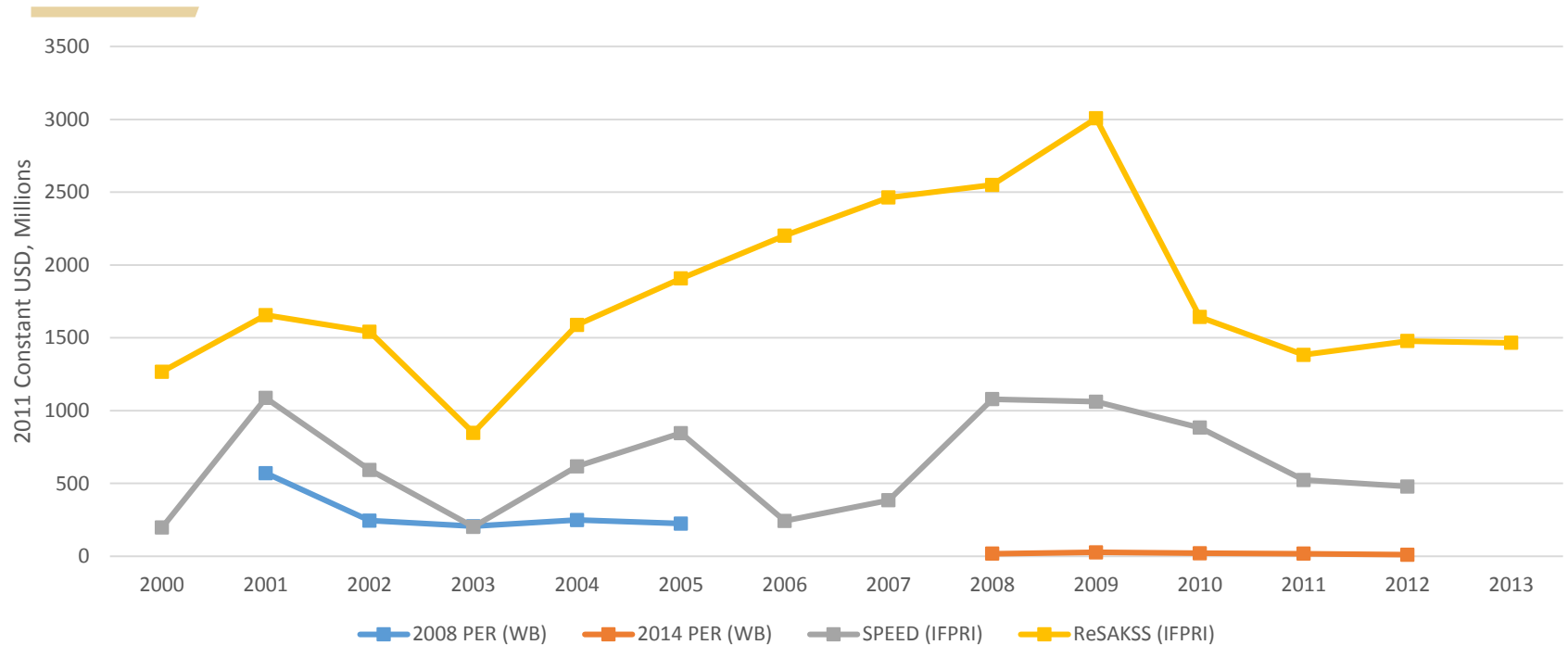
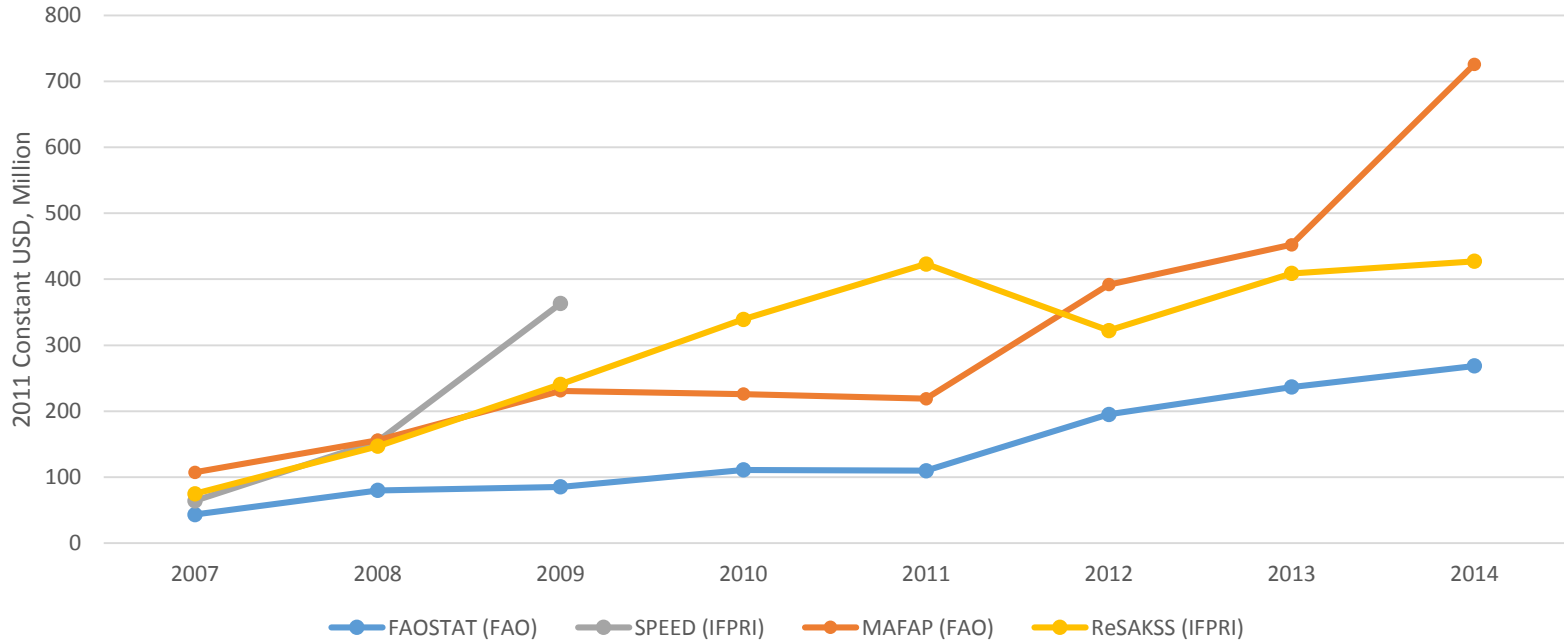


Figure 2c: Actual public agricultural expenditure, Tanzania

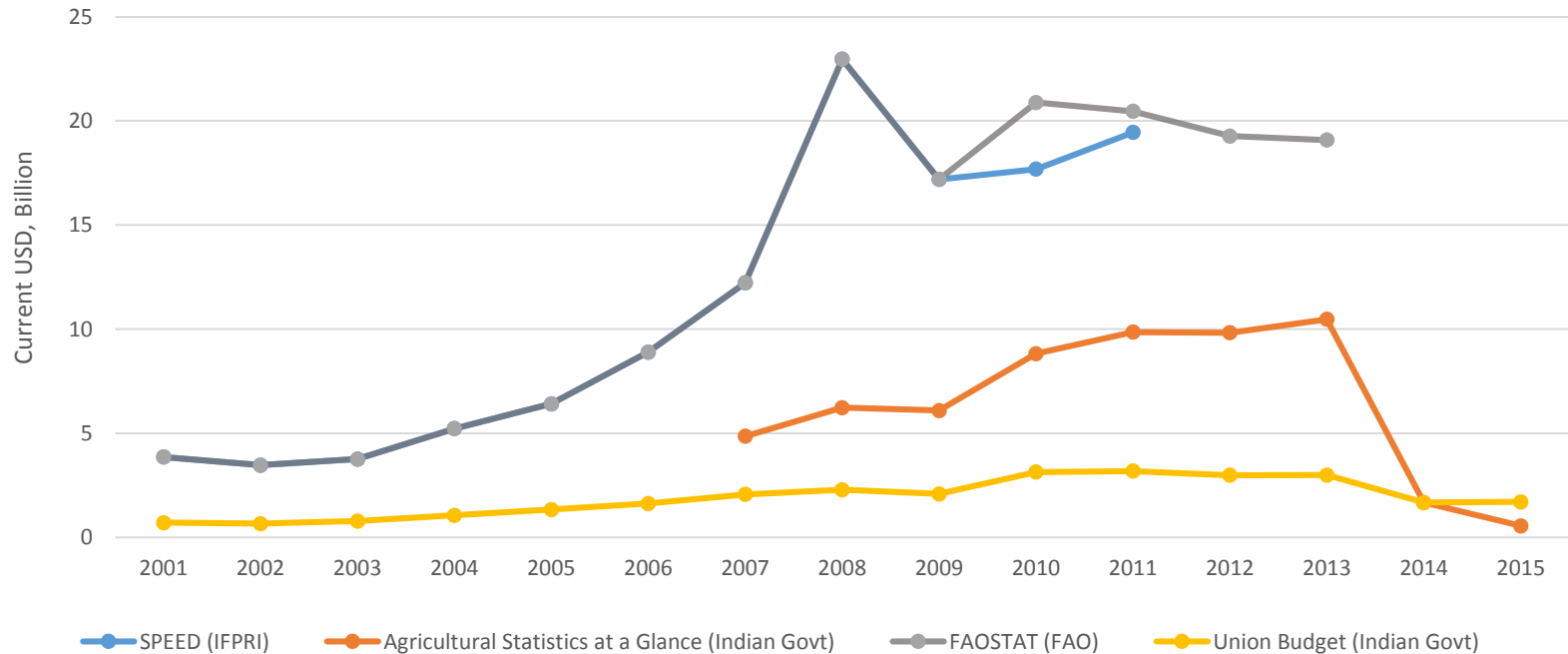


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Figure 2d: Actual public agricultural expenditure, India



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Indicator 3: Percentage of Total Public Expenditure on Agriculture



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Figure 3a: Percentage of total public expenditure on agriculture, Ethiopia

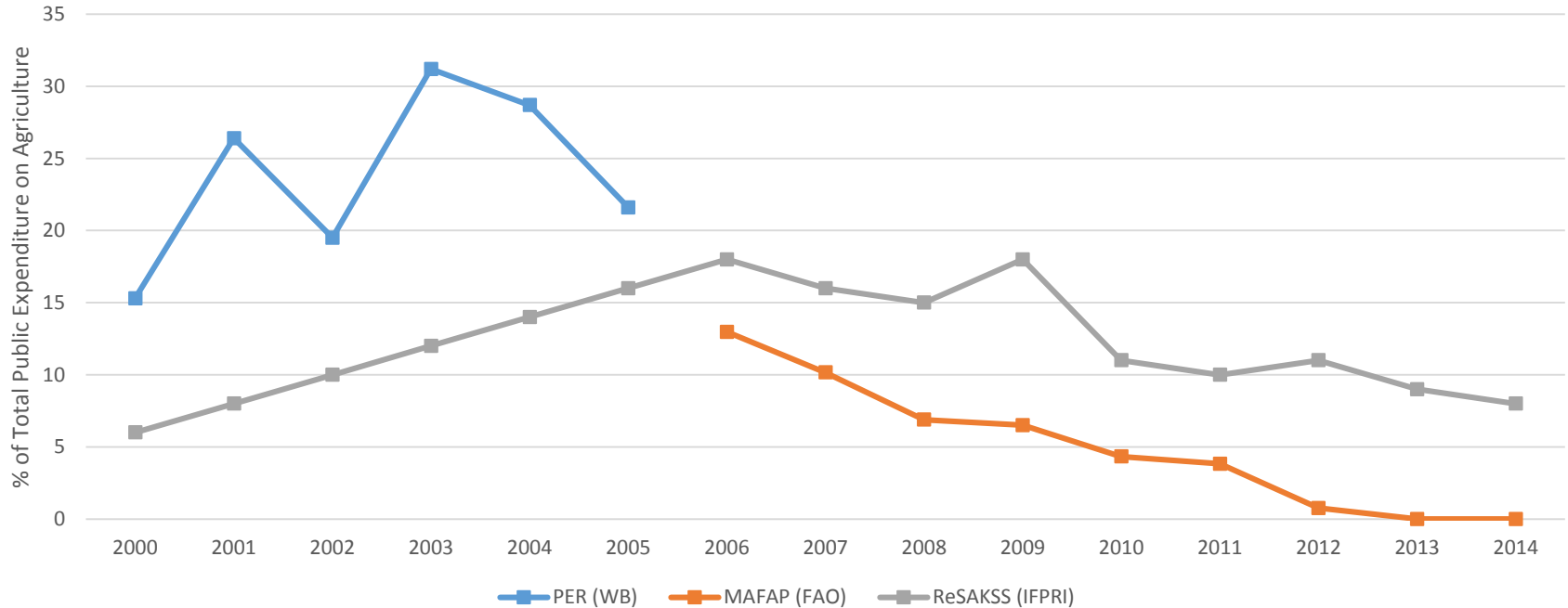
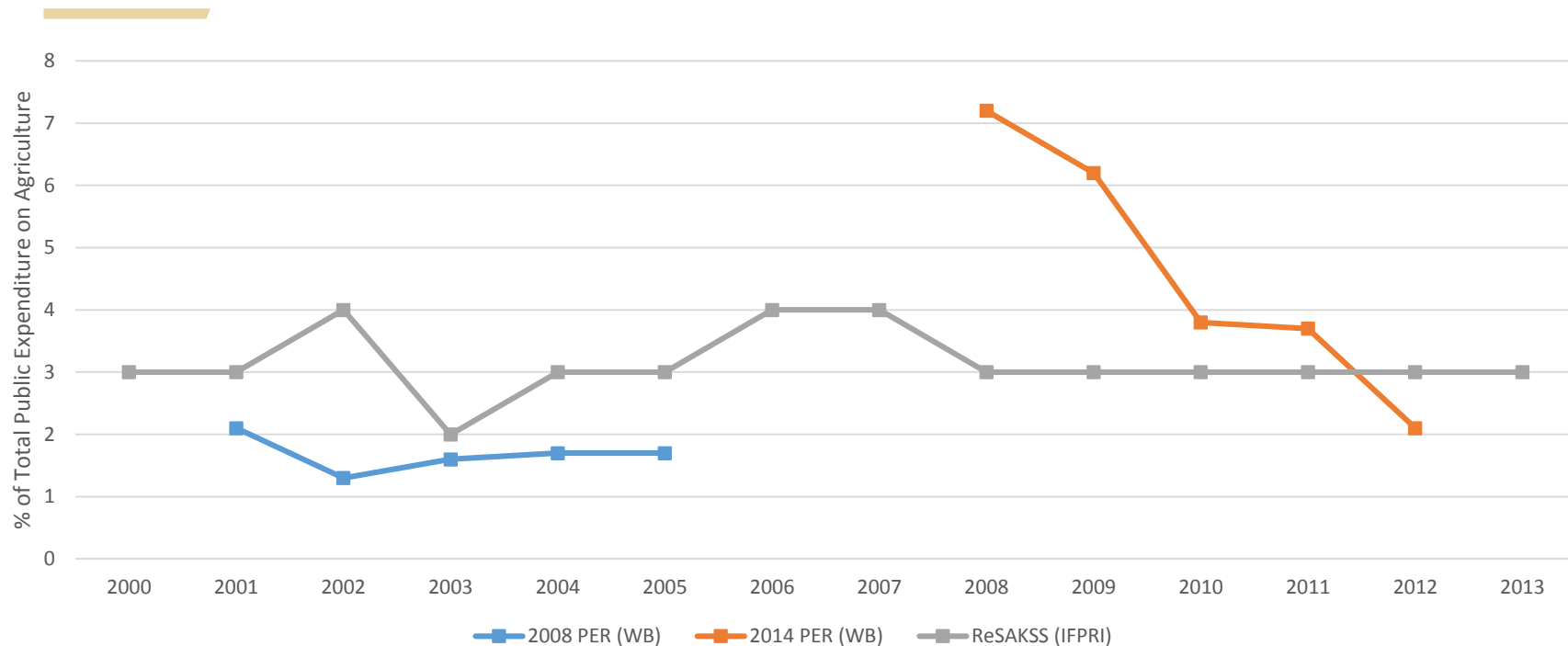


Figure 3b: Percentage of total public expenditure on agriculture, Nigeria



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Figure 3c: Percentage of total public expenditure on agriculture, Tanzania

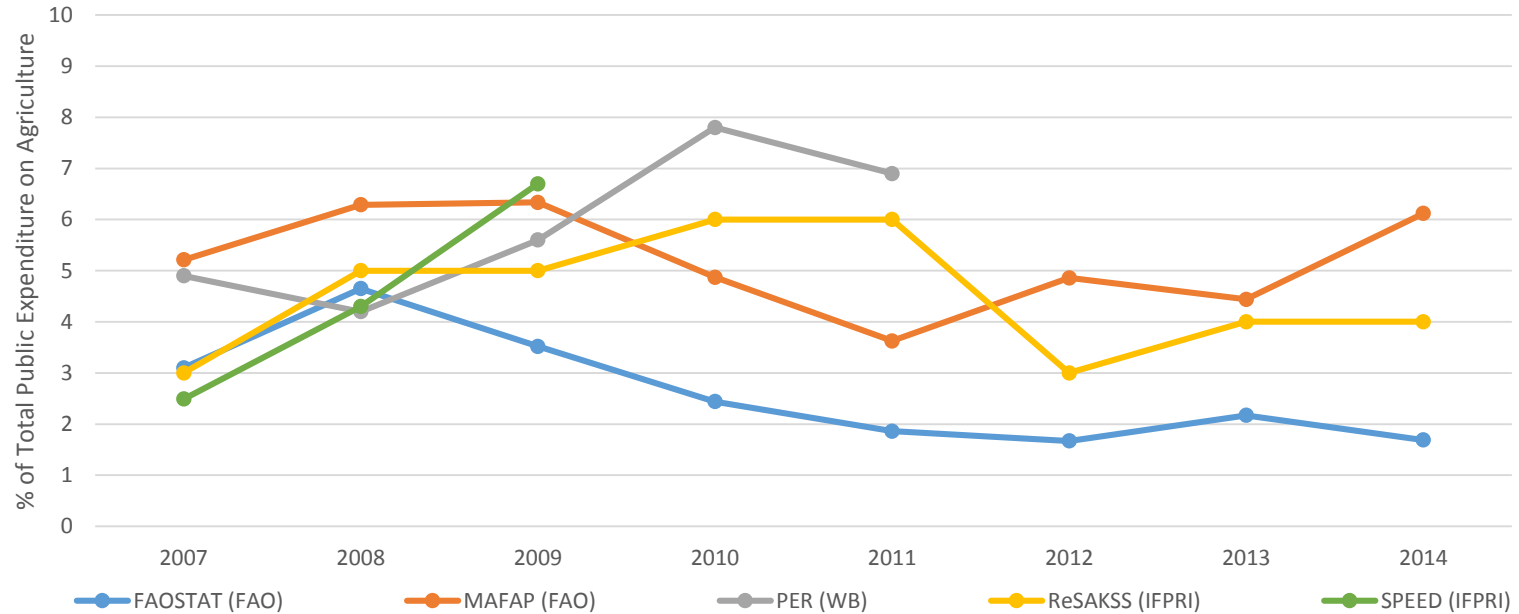
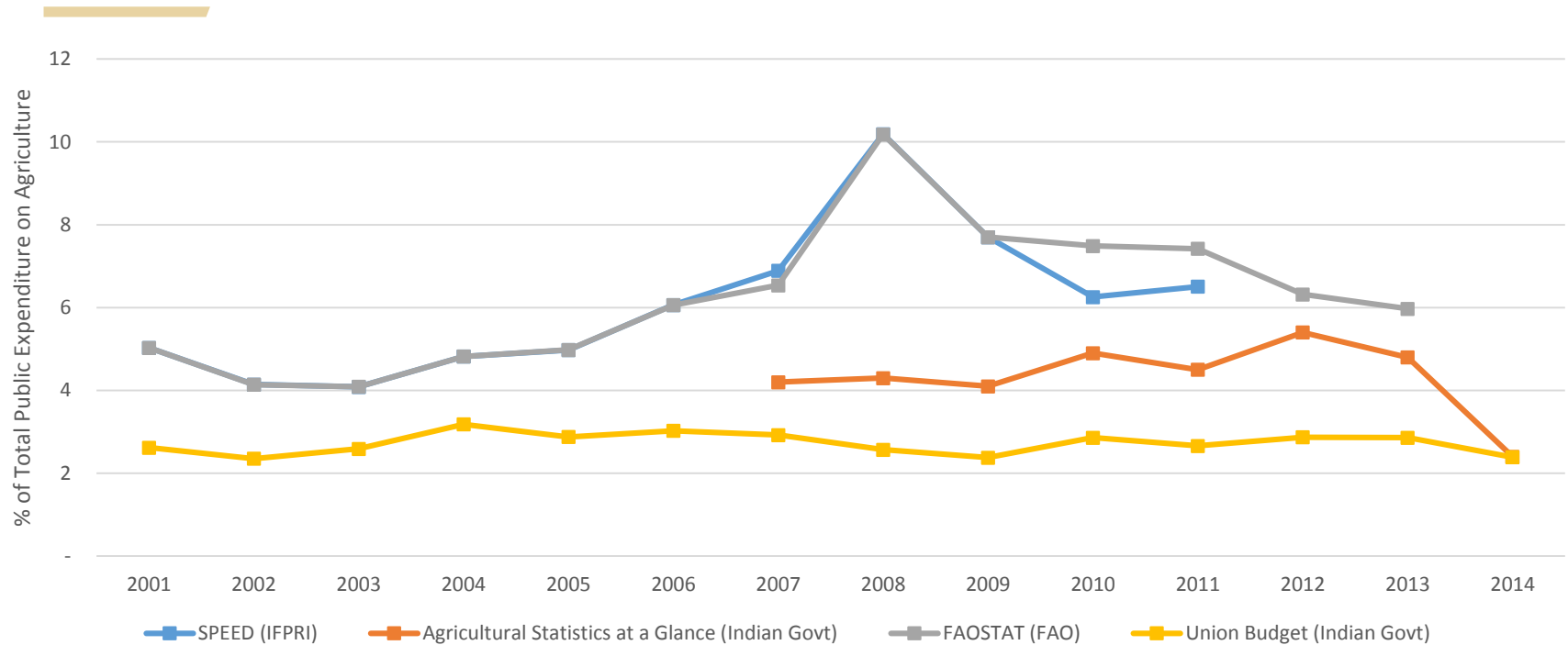


Figure 3d: Percentage of total public expenditure on agriculture, India



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Indicator 4: Public Agriculture Research and Development Expenditure

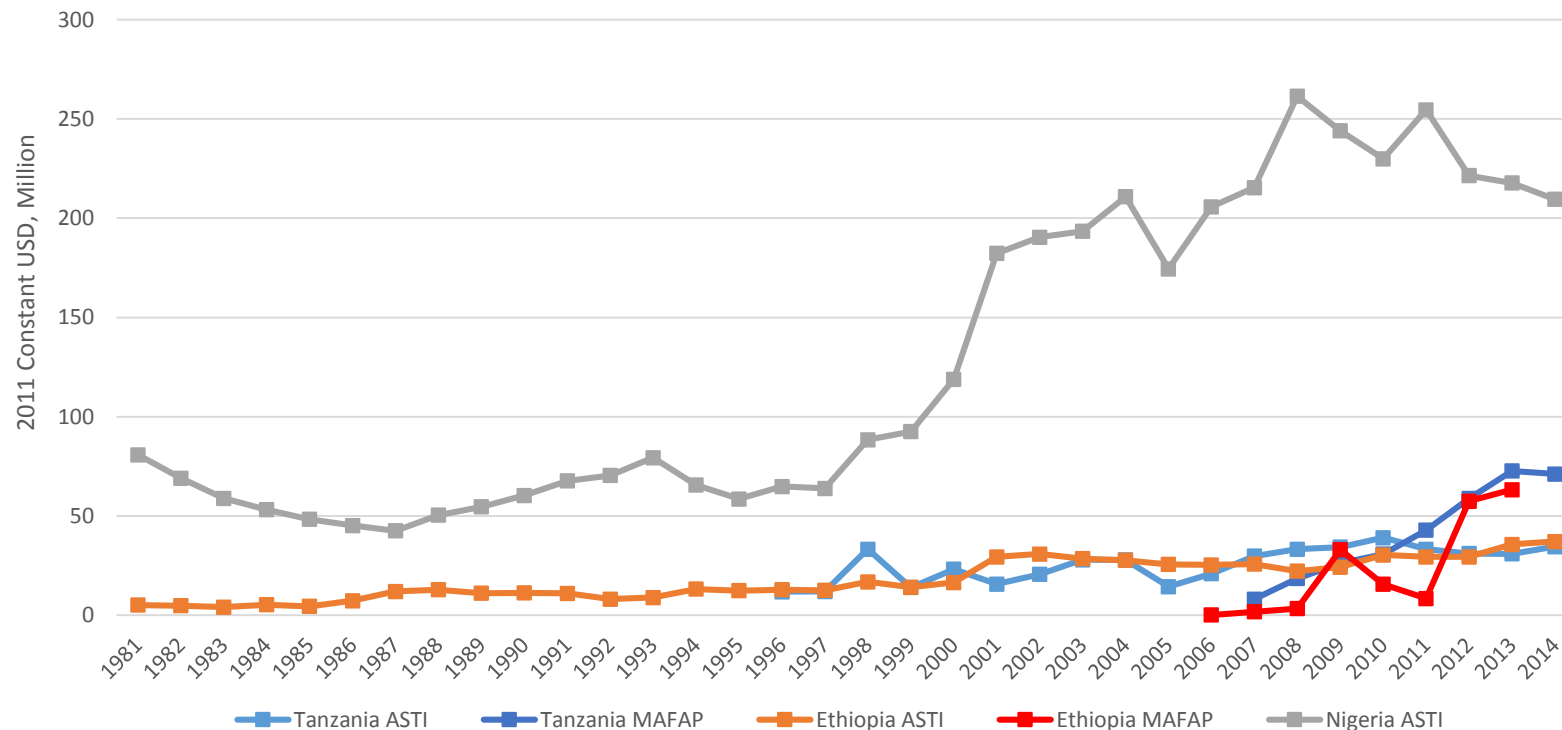


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Figure 4a. Public Ag R&D expenditure, Tanzania, Ethiopia and Nigeria



Note:

1. Nigeria's Appropriation Act data have not yet been collected and are not included here.
2. Though the ASTI database also covers India, it is shown separately because India's spending is much higher than the three African countries.
3. FAOSTAT reports data on public agricultural R&D expenditure which come from ASTI and are identical, so are not displayed separately.

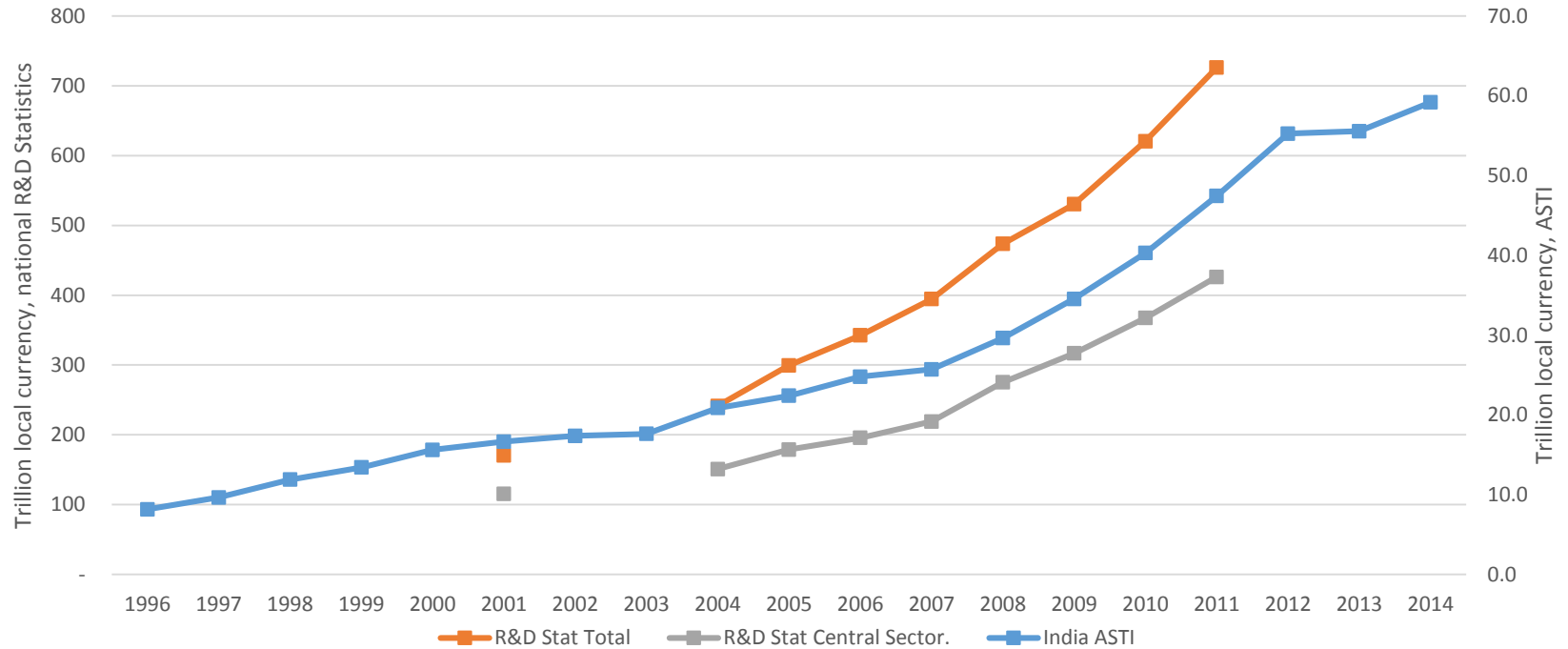


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Figure 4b. Public Ag R&D expenditure, India



Note:

1. ASTI data are plotted against the right hand side axis due to large scale differences.
2. Union Budget and Agriculture At a Glance R&D spending data are not yet collected, thus not shown on the figure.
3. National R&D Statistics data for the central sector (R&D Stat Central Sector) include Indian government ministries and 117 R&D units of public sector/joint sector companies. "R&D Stat Total" include state level and private sector agricultural R&D expenditures.



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Data Source Descriptions: Multi-Country Data Sources



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FAOSTAT (FAO)

- > **Countries for which we use data:** India, Tanzania
- > **Indicators for which we use data:** actual government agriculture expenditure, percentage of total public expenditure on agriculture
- > **Units reported:** Expenditure: current US dollars, constant 2005 US dollars, current local currency
 - Constant 2005 US dollars were converted to constant 2011 US dollars for comparison
- > **What is counted:**
 - **India:** Central government expenditure (agriculture, forestry, fishing)
 - **Tanzania:** General/central government expenditure on agriculture
- > **Methods:** Government expenditure data are collected directly from countries using a Government Expenditures on Agriculture questionnaire together with the IMF Statistics Department.
 - The questionnaire is based on the Government Finance Statistics Manual, 2001 (GFSM 2001) methodology. In particular, it requests subsector detail on expenditures on the narrow agricultural subsector, and separately on forestry and fisheries; on environmental protection; and breakdowns on recurrent and capital expenditures (the amount spent on physical investment and infrastructure).
 - Questionnaires are distributed to national ministries, including but not limited to Ministry of Finance, Ministry of Agriculture, and the Central Bank, with some additional data sourced from OECD's CRS for development flows and IFPRI's ASTI for expenditure on agriculture R&D.



MAFAP (FAO) **Monitoring and Analysing Food and Agricultural Policies**

- > **Countries for which we use data:** Ethiopia, Tanzania
- > **Indicators for which we use data:** budgeted and actual government agriculture expenditure, percentage of total public expenditure on agriculture
- > **Units reported:** constant 2011 US dollars
- > **What is counted:** total expenditures in support of food and agriculture sector (policy transfers)
 - MAFAP “captures all expenditure measures that generate explicit or implicit monetary transfers in support of food and agricultural sector development. Monetary transfers towards food and agriculture are thus systematically considered whether they support the agricultural sector through private goods (e.g. input subsidies), global goods (e.g. research) or indirectly (e.g. rural health)” (Ghins et al., 2013)
 - Includes spending on agricultural research, technical assistance, training, extension/technology transfer, inspection, infrastructure, storage/public stockholding, marketing, other general support to food and agriculture sector
 - Does not include administrative costs nor donor aid; administrative costs average an additional 10-15% to the total budget
- > **Methods:** MAFAP uses a methodology derived from the OECD Producer Support Estimate methodology (PSE), which measures the level of support from OECD Member States to their agriculture sector.



SPEED (IFPRI) **Statistics on Public Expenditures for Economic Development**

- > **Countries for which we use data:** Ethiopia, Nigeria, Tanzania, India
- > **Indicators for which we use data:** actual government agriculture expenditure, percentage of total public expenditure on agriculture (Tanzania and India only)
- > **Units reported:** constant 2005 and current US dollars
 - Constant 2005 US dollars were converted to constant 2011 US dollars for comparison
- > **What is counted:** public expenditure data for agriculture and other sectors, total public expenditures
 - Under IMF terminology, agriculture spending falls under the broad category “agriculture, forestry, fishing, and hunting” so data discrepancies may arise due to the inclusion of non-agriculture specific spending data. This would only affect India for the years analyzed.
- > **Methods:** data may be collected from IMF Government Financial Statistical Yearbook, IMF Statistical Appendix and Selected Issues publications, World Bank Public Expenditure Reviews, and national sources downloaded from government websites and in hard copy. Extensive data checks and adjustments are performed to ensure consistent spending measurements over time that are free of exchange-rate fluctuations and currency denomination changes.
 - Imputations are also estimated for missing values in the database. Three methods are used to calculate the imputation: average, linear trend and 5 year average growth rate.



SPEED (IFPRI) cont'd

Country data were collected from the following sources:

- > **India:** all data came from IMF.
- > **Ethiopia:** data came from the IMF (1980-1999) and Ethiopia's Ministry of Finance (2000-2012).
- > **Nigeria:** all data came from Nigeria's Central Bank.
- > **Tanzania:** data came from the IMF (1980-1985), interpolation through averages or linear trend (1986-1994), and Tanzania's National Bureau of Statistics (1995-2009).



ReSAKKS (IFPRI) Regional Strategic Analysis and Knowledge Support System

- > **Countries for which we use data:** Ethiopia, Nigeria, Tanzania
- > **Indicators for which we use data:** actual government agriculture expenditure, percentage of total public expenditure on agriculture
- > **Units reported:** constant 2010 US dollars
 - Constant 2010 US dollars were converted to constant 2011 US dollars for comparison
- > **What is counted:** government agriculture expenditure
- > **Methodology:** data are collected from World Bank, FAOSTAT, UN Statistics Division National Accounts, UN MDG statistics, IMF Economic Outlook Indicators, IFPRI Global Hunger Index, and Ministries of Agriculture and Finance. Due to ReKASS using data from other sources in this analysis but from varying years (FAOSTAT and IMF), trend lines may match for some timeframes but then diverge if data from another source are used.





Data Source Descriptions: Country-Specific Data Sources



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Ethiopia Agriculture and Rural Development Public Expenditure Review (PER): 2000–2006 (World Bank)

- > **Indicators for which we use data:** budgeted and actual government agriculture expenditure, percentage of total public expenditure on agriculture
- > **Units reported:** constant and current local currency
 - Current local currency figures were converted to current US dollars using the World Bank official annual exchange rate for each year (year average) for comparison
- > **What is counted:** sector oversight (administrative expenses of Ministry of Agriculture, Ministry of Rural Development (MoARD); not program related); natural resource and environmental management (all program expenditures); extension and TVET (expenditures by MoARD and regional bureaus in technical and vocational training and extension activities); agricultural marketing and cooperatives; agricultural research; improved seed development; vulnerability and food security; water resource management; rural energy and mining; federal roads; small scale irrigation; rural roads; other rural infrastructure development; rural water supply
- > **Methodology:** data are collected through points of contact in governmental departments such as the Ministries of Agriculture and Finance. Data do not include rural health and education programs. Data do include formal (documented in budgets and expenditure reports) capital expenditures financed by foreign entities. Data on expenditures do not include donor funds that are in special accounts not accounted for in reviewed budgets.



Nigeria Agricultural Public Expenditure Review (PER): 2001–2005 (World Bank)

- > **Indicators for which we use data:** budgeted and actual government agriculture expenditure, percentage of total public expenditure on agriculture
- > **Units reported:** constant 2001 local currency
 - Constant 2001 local currency figures were converted to current US dollars using the World Bank official annual exchange rate for that year for comparison
- > **What is counted:** public expenditures *in* agriculture, as opposed to public spending *for* agriculture;
 - expenditure categories included agricultural research, agricultural extension and training, agricultural marketing, agricultural input supply and subsidization (seeds, fertilizer, crop chemicals, etc.), crop development, livestock development, fisheries, irrigation (to the extent that it is undertaken by federal and state ministries of agriculture and local departments of agriculture), and food security
 - a “substantial amount” of external aid is not captured
 - additionally, the authors choose to exclude forestry and wildlife data.
- > **Methodology:** data are collected from the Ministry of Agriculture and public finance and expenditure reports from other ministries and agencies. The report states four issues affecting data validity: 1) inconsistent data from sources; 2) uncertainty concerning what falls under official government spending for some years; 3) recurrent cost misclassifications under capital spending; 4) poor documentation of “off-budget” expenditures and donor funds.



Nigeria Agricultural Public Expenditure Review (PER): 2008–2012 (World Bank)

- > **Indicators for which we use data:** budgeted and actual government agriculture expenditure, percentage of total public expenditure on agriculture
- > **Units reported:** constant 1990 local currency
 - Constant 1990 local currency figures were converted to current US dollars using the World Bank official annual exchange rate for that year for comparison
- > **What is counted:** recurrent and capital expenditures from federal, state, and local government levels from ministries of agriculture; ministries responsible for agriculture-related activities; and other key ministries, departments, agencies, and offices responsible for finance, revenue, budget, planning, and local government affairs; also includes off-budget public expenditures from donor agencies (World Bank, Gates Foundation, IFAD, ADB)
 - This review includes expenditures on forestry and fisheries, and off-budget public expenditures from donor agencies (World Bank, Gates Foundation, IFAD, ADB) which may represent 3 to 11 percent of state budgets
- > **Methodology:** data are collected from ministries of agriculture; ministries responsible for agriculture-related activities; and other agencies when relevant. Data issues are similar to the 2001-2005 review and include inconsistent data across sources, and poor record keeping techniques.



Nigeria Appropriation Acts: 2009–2016 (Nigerian Government)

- > **Indicators for which we use data:** budgeted government agriculture expenditure
- > **Units reported:** current local currency
 - Current local currency figures were converted to current US dollars using the World Bank official annual exchange rate for each year (year average) for comparison
- > **What is counted:** recurrent and capital budgeted expenditure for Federal Ministry of Agriculture; including expenditures on administrative overhead for all agricultural research institutes, expenditures for extension services, expenditures for infrastructure improvements
- > **Methodology:** these data are from the Federal Republic of Nigeria budgetary process. Agriculture data fall under the budget and actual spending of the Ministry of Agriculture and Rural Development.



Tanzania Agricultural Public Expenditure Review (PER): 2007–2011 (World Bank)

- > **Indicators for which we use data :** government budget allocation for agriculture; % of budgeted agriculture spending in total government budget
- > **Units reported:** current local currency
 - Current local currency figures were converted to current US dollars using the World Bank official annual exchange rate for each year (year average) for comparison
- > **What is counted:** provision of agriculture inputs; core public goods such as irrigation infrastructure, rural roads, and markets infrastructure; provision of subsidized inputs; administrative expenditures and capital expenditures (infrastructure, equipment, other capital, studies)
 - Does not include rural health, education programs, formal (documented in budgets and expenditure reports) capital expenditures financed by foreign entities, and donor funds in special accounts
 - Only expenditure at the national/federal level is included
- > **Methodology:** data are from federal government budgetary and agricultural data and authors' computations. Authors note expenditures have shifted from the national/federal to the state/local level over time, and therefore national level data as reported in the PER does not represent total government expenditures on agriculture.



Tanzania Public Expenditure and Financial Accountability (PEFA) Review: 2000–2006 (World Bank)

- > **Indicators for which we use data:** budgeted government expenditure on agriculture & food security
- > **Units reported:** current local currency
 - Current local currency figures were converted to current US dollars using the World Bank official annual exchange rate for each year (year average) for comparison
- > **What is counted:** includes food security, includes external aid
- > **Methodology:** PEFA is a methodology for assessing public financial management (PFM) performance. It provides the foundation for evidence-based measurement of countries' PFM systems. A PEFA assessment measures the extent to which public financial management systems, processes and institutions contribute to the achievement of desirable budget outcomes: aggregate fiscal discipline, strategic allocation of resources, and efficient service delivery.



India Agriculture Statistics at a Glance: 2007–2015 (Indian Government)

- > **Indicators for which we use data:** budgeted and actual government agriculture expenditure*, percentage of total public expenditure on agriculture
- > **Units reported:** current local currency
 - Current local currency figures were converted to current US dollars using the World Bank official annual exchange rate for each year (year average) for comparison
- > **What is counted:** agriculture and allied activities
 - Data are broken down by: crop husbandry, horticulture, soil & water conservation, animal husbandry, dairy development, fisheries, forestry & wild life, plantation, food storage & warehousing, Ag R&D and education, agricultural financial institutions, ag cooperation, and other agricultural programs
- > **Methods:** Data are collected from India's annual plan; raw data providers are Ministry of Finance.



India Union Budget: 2007–2015 (Indian Government)

- > **Indicators for which we use data :** budgeted and actual government agriculture expenditure, percentage of total public expenditure on agriculture
- > **Units reported:** current local currency
 - Current local currency figures were converted to current US dollars using the World Bank official annual exchange rate for each year (year average) for comparison
- > **What is counted:** agriculture and allied activities
 - includes provision for rural roads but excludes provision for rural housing.
- > **Methods:** This budget is designed, developed and hosted by National Informatics Centre based on information collected from Ministry of Finance departments and Ministry of Agriculture and Farmers Welfare (including Department of Agriculture, Cooperation and Farmers Welfare; Department of Agricultural Research and Education; Department of Animal Husbandry, Dairying and Fisheries)





Data Source Descriptions: R&D Data Sources



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ASTI – Agricultural Science and Technology Indicators (IFPRI)

- > **What is measured:** total public R&D spending - salary-related expenses, operating and program costs, and capital investments by government, nonprofit, and higher education agencies; also information about agricultural research capacity.
 - Data on spending by private entities are excluded.
- > **Units:** current and constant 2011 local currency, constant 2011 US & PPP dollar for expenditure; FTE for research capacity
- > **Country data availability and breakdown of categories:**
 - **Ethiopia** (1981-2014): Breakdown of R&D spending by cost category (salaries, operating and program costs and capital investments) or funding source (government, donor, commodity levies, sales of goods and services and other funding)
 - **India** (1996-2014): Breakdown not possible
 - **Nigeria** (1981-2014): Breakdown by cost category
 - **Tanzania** (1996-2014): Breakdown by cost category or funding source
- > **Methodology:** ASTI data collection is carried out by country focal points, who distribute survey forms to all agencies known to conduct agricultural research in a given country, including government, nonprofit, and higher education agency.



FAOSTAT (FAO)

- > **What is measured:** Public agriculture research spending
- > **Unit:** 2011 PPP dollars
- > **Country data availability :**
 - **Ethiopia** (2000-2011)
 - **India** (2000-2009)
 - **Nigeria** (2000-2011)
 - **Tanzania** (2000-2011)
- > FAOSTAT does not collect its own Ag R&D expenditure data. Instead, it uses ASTI data on agriculture R&D and shows the data under a section called “ASTI R&D Indicators” with two subsections: “ASTI-Researchers” and “ASTI-Expenditures”. We therefore do not separately include FAOSTAT data for agricultural R&D spending and instead just show ASTI data.



MAFAP – Monitoring African Food and Agricultural Policies (FAO)

- > **What is measured:** Public agriculture research spending
- > **Unit:** current and constant 2011 US dollar, current and constant local currency
- > **Country data availability :**
 - **Ethiopia** (2006-2013): Breakdown by donor and national funding source, actual and budgeted
 - **Tanzania** (2007-2014): Break down by donor and national funding source, actual and budgeted



Nigeria national source

Appropriations Acts (2009-2015)

- **What is measured:** Agriculture research and development, agriculture universities and institutes budget allocations
- **Unit:** current local currency
- Data not yet integrated into figures



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India national sources

Research and Development Statistics (Biennial)

- **What is measured:** National expenditure on R&D (1970-2012) in local currency; National R&D expenditure (1990-2012) at current and constant 2004 local currency, as % of GDP and as % of GNP
 - > Data are broken down by: sector (1970-2010), major scientific agencies (1970-2010), by ministries (2005-2010), by state government (2005-2010), by objective* (2005-2007), by industry (2007-2010) and by industrial sector (2005-2010).
- **Unit:** current local currency

Agriculture Statistics at a Glance (2007-2015)

- **What is measured:** Agriculture research and education spending
 - > Includes both central government and state data
- **Unit:** current local currency
- Data not yet integrated into figures

Union Budget (2007-2015)

- **What is measured:** Agriculture research and education spending
- **Unit:** current local currency
- Data not yet integrated into figures

* Objectives include defense, control and care of the environment, agricultural production and technology, and so on.



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Evans School Policy Analysis & Research Group (EPAR)

Professor C. Leigh Anderson, Principal Investigator

Professor Travis Reynolds, co-Principal Investigator

C. Leigh Anderson, Travis Reynolds, Pierre Biscaye, Beijie Wang, Jack Knauer, and Karen Chen

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Please direct comments or questions about this research to Principal Investigators C. Leigh Anderson and Travis Reynolds at epar.evans.uw@gmail.com.

