CGIAR

RESEARCH PROGRAM ON Policies, Institutions, and Markets

Led by IFPRI

Annual Report 2016

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AfricaRice · Bioversity International · CIAT · CIFOR · CIMMYT International Maize and Wheat Improvement Center · CIP International Potato Center, A CGIAR Research Center · ICARDA · IFPRI · ICRISAT Science with a human face · IITA Research to Nourish Africa · ILRI International Livestock Research Institute · IRRI · IWMI International Water Management Institute · World Agroforestry Centre · WorldFish

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LIST OF ACRONYMS

A4NH: CGIAR Research Program on Agriculture for Nutrition and Health
AGRODEP: African Growth and Development Policy Modeling Consortium
ANGeL: Agriculture, Nutrition, and Gender Linkages project
ASARECA: Association for Strengthening Agricultural Research in Eastern and Central Africa
ASTI: Agricultural Science and Technology Indicators
BCC: behavior change communication
CCAFS: CGIAR Research Program on Climate Change, Agriculture and Food Security
CGE: computable general equilibrium
CIAT: International Center for Tropical Agriculture
CIFOR: Center for International Forestry Research
CIMMYT: International Maize and Wheat Improvement Center
CIP: International Potato Center
COP: Conference of Parties
CRP: CGIAR Research Program
CRS: Catholic Relief Services
CSSP: Country Strategy Support Program
FAO: Food and Agriculture Organization of the United Nations
FES: Foundation for Ecological Security (India)
FTA: CGIAR Research Program on Forests, Trees and Agroforestry
G20: Group of Twenty
GIZ: Deutsche Gesellschaft für Internationale Zusammenarbeit
GM: genetically modified
ICARDA: International Center for Agricultural Research in the Dry Areas
ICRAF: World Agroforestry Centre
ICRISAT: International Crops Research Institute for the Semi-Arid Tropics
IDB: Inter-American Development Bank
IDO: intermediate development outcome
IFAD: International Fund for Agricultural Development
IFPRI: International Food Policy Research Institute
ILRI: International Livestock Research Institute
ILC: International Land Coalition
IMPACT: International Model for Policy Analysis of Agricultural Commodities and Trade
IRRI: International Rice Research Institute
ISI: Institute for Scientific Information
ISPC: Independent Science and Partnership Council (of CGIAR)
IWMI: International Water Management Institute
LAC: Latin America and the Caribbean
MARLO: Monitoring Agricultural Research for Learning and Outcomes
M&E: monitoring and evaluation
NEPAD: New Partnership for Africa's Development
NGO: nongovernmental organization
OECD: Organisation for Economic Co-operation and Development
PIM: CGIAR Research Program on Policies, Institutions, and Markets
PMCA: Participatory Market Chain Approach
PMU: Program Management Unit (of PIM)
PSNP: Productive Safety Net Program (Ethiopia)
ReSAKSS: Regional Strategic Analysis and Knowledge Support System

R&D: research and development
RTB: CGIAR Research Program on Roots, Tubers and Bananas
SAM: Social Accounting Matrix
SPEED: Statistics of Public Expenditure for Economic Development database
SPIA: Standing Panel on Impact Assessment (of CGIAR)
SLM: sustainable land management
SMO: System Management Office (of CGIAR)
STAARS: Structural Transformation of African Agriculture and Rural Spaces
TMRI: Transfer Modality Research Initiative project
UNFCC: United Nations Framework Convention on Climate Change
UNICEF: United Nations Children's Fund
USAID: United States Agency for International Development
USD: US dollars
W1-2: Window 1-2 of the CGIAR Fund
W3: Window 3 of the CGIAR Fund
WEAI: Women's Empowerment in Agriculture Index
WFP: World Food Programme
WLE: CGIAR Research Program on Water, Land, and Ecosystems
WTO: World Trade Organization

A. Key Messages

Overview, and synthesis of progress and challenges

In 2016, PIM researchers delivered a strong program in completion of Phase 1, and simultaneously contributed to design of Phase 2 for 2017-2022. Key accomplishments include increased use of the foresight modeling tools by various stakeholders; publication of compendiums on *inter alia* agricultural research in Africa, agricultural productivity in Africa, food price volatility, and value chains; a strong body of publications on social protection and evidence of influencing the modalities of safety net programs; continued support to progress in development of legislative and regulatory frameworks for biosafety; and development of indicators and tools with demonstrated use by implementing partners (e.g., on R&D intensity, trade, value chains, gender, geospatial tools, and social accounting matrices). 102 ISI journal articles were published, in addition to highly regarded books. Numerous events were (co)-organized or sponsored to disseminate research results, facilitate dialogue with counterparts and implementing partners, and build capacity of institutions and individuals.

PIM's research addresses the broad outcomes of the CGIAR Strategy and Results Framework and concurrently responds to more immediate issues that affect the global food system. For example, work on trade (Flagship 3) and migration (Flagship 2) informed global, regional, and national debates on these topics in 2016 and promises to be of continued relevance in 2017. Foresight modeling argues against complacency regarding food prices, with a reminder that the recent experience of declining global food prices is not expected to persist in the longer run. Resurgence of large-scale hunger and deprivation in 2016 associated with adverse weather and conflict highlights the importance of social protection to address persistent vulnerability.

The PIM management team focused its attention on:

- *Submission of a strong proposal for Phase 2*, which was well received by the Independent Science and Partnership Council of CGIAR (ISPC), reviewers, and donors.
- *Striking a balance in the 2016 work program* between wrapping up Phase 1 products and paving the way for new Phase 2 research topics (e.g., policy processes, increased focus on seed systems, linkage between social protection and agricultural growth).
- *Fiduciary oversight and prudent management of the budget* to assure that resources were used as intended and high quality products delivered.
- *Preparing for Phase 2 implementation*: flagship leaders were selected through a transparent and competitive process; terms of reference were drafted for the program's governance and management entities; flagship managers were appointed; PIM management and participating Centers convened in November to prioritize research topics within each flagship; preparatory work was done to host the CGIAR Collaborative Platform for Gender Research; the PIM Director discussed co-investment with other CRP Directors.
- *Continued focus on M&E and impact assessment*: PIM partnered with IFPRI to commission an external impact assessment of IFPRI's policy research on science, technology, and innovation; refined the program's theories of change; collaborated with A4NH, CCAFS, Livestock, and WLE to develop the Monitoring Agricultural Research for Learning and Outcomes (MARLO) tool; created an Impact page on the PIM website and launched the PIM Outcome Notes series; actively participated in the CGIAR Monitoring, Evaluation, and Learning Community of Practice; and interacted with the staff leading the CGIAR evaluations on gender, partnerships, and capacity.
- *Enhanced interactions with donors and implementation partners*: The Program Director and Program Management Unit (PMU) Senior Research Fellow visited donor agencies to keep them informed about the program, and pursued dialogue with the International Fund for Agricultural Development (IFAD) and the World Bank to increase integration between PIM's analytical contributions and multilateral investment operations.
- *Continued efforts to improve attribution and branding of outputs to PIM, and enhanced outreach* (PIM brochure, quarterly newsletter).

Two significant achievements/success stories

Foresight modeling to support decision making

The foresight team comprising all CGIAR Centers produced publications demonstrating the technical strength of the modeling tools and a set of policy papers and briefs attesting to their practical applications (link). A widely quoted article in *The Lancet* resulting from a collaboration between IFPRI and Oxford University reported that changes in dietary composition associated with climate change (primarily a reduced consumption of fruits and vegetables) and food availability (modest drop in calories among the already vulnerable) will increase annual deaths by over 500,000 by 2050. Projections of the effects of climate change on global food security were presented at the UNFCC Conference of the Parties (COP22) and at the Global Landscapes Forum. The team made major advances in modeling tradeoffs between different policy goals (e.g., yield growth and water management) through analysis of scenarios of alternative investment strategies.

In 2016, the National Economic and Development Authority of the Philippines used the IMPACT modeling apparatus and the policy notes produced by the team in national discussions on climate change that informed decisions on trade policies. The Food and Agriculture Organization of the United Nations (FAO) used two background papers as inputs to the 2016 State of Food and Agriculture report on climate change, agriculture and food security. The Global Panel on Agriculture and Food Systems for Nutrition used IMPACT model simulation results and analysis in preparation of the report "Food systems and diets: Facing the challenges of the 21st century," as did the Organisation for Economic Co-operation and Development (OECD) in its report "Alternative Futures for Global Food and Agriculture."

Analysis to underpin more effective social protection programs

PIM studies on social protection in Bangladesh, most notably the Transfer Modality Research Initiative (TMRI), have informed several changes to social protection programs in the country. The results of the TMRI randomized controlled trial showed that all combinations of types of transfers were useful, but that cash transfers combined with messaging about how to improve nutrition, also known as nutrition behavior change communication (BCC), had the greatest impact. Influenced by the TMRI findings, the Ministry of Women and Children Affairs incorporated the BCC component into its Vulnerable Group Development program, which has more than 1 million beneficiaries. The Agriculture, Nutrition, and Gender Linkages (ANGeL) project launched by the Bangladesh Ministry of Agriculture in 2015 also includes specific BCC strategies to promote women's empowerment, nutrition, and health and maximize impacts on nutrition. The new Income Support Programme for the Poorest, a World Bank-funded project implemented by the Bangladesh Ministry of Local Government, Rural Development & Cooperatives, and expected to reach 600,000 mothers and pregnant women, will expand upon a tested conditional cash transfer pilot that provides monthly transfers to poor mothers who attend sessions on nutrition education and have their children's growth monitored in health clinics. The United Nations' REACH Bangladesh program cited the TMRI study in a nutrition background paper for the 7th Five Year Plan (2016-2020) of the Bangladesh government. The PIM research on social protection in Bangladesh draws on regular interactions with A4NH researchers.

PIM's research on social protection was also influential in Africa south of the Sahara. UNICEF used the team's analysis of the baseline survey data for the Integrated Nutrition and Social Cash Transfer Program in Ethiopia to inform the design of its behavior change communication sessions, and emphasize the need to treat drinking water, use soap when hand washing, and improve hygiene by removing animal waste from household compounds. Results from a PIM study on gender and risk management in the Sahel were used by the World Bank to select interventions better suited to women in its Sahel Adaptive Social Protection Program targeting 500,000 households in West Africa (Burkina Faso, Chad, Niger, Mali, Mauritania, and Senegal).

Overall financial summary

The 2016 Financing Plan W1-2 amount for PIM was USD 17.7 million, and the actual amount received was USD 17.3 million[1]. Adding a carryover amount from 2015 of USD 8.7 million (including USD 2 million received in late 2015 and unallocated in 2015), the total available in 2016 was USD 26 million. PIM management maintained a prudent budgeting approach and allocated USD 15.6 million (i.e. 88% of the Financing Plan amount); and allowed participating centers to carry over USD 6.7 million, which resulted in a total allocation of USD 22.3 million. Financial records available as of April 2017 show W1-2 expenditure of USD 20.5 million, i.e. 92% of the allocated amount. Window 3 and bilateral expenditures are estimated at USD 51.6 million, representing 72% of the program.

B. Impact Pathway and Intermediate Development Outcomes (IDOs)

PIM researchers use four primary pathways translating research outputs to policy outcomes:

- *Influencing global agendas and policies, via major outputs and reports, participation in global events, and long-term partnerships with development organizations* (most closely aligned with the Intermediate Development Outcome (IDO) "Enabling environment improved.") In 2016, researchers supported by PIM contributed to the debate on the Sustainable Development Goals (trade, gender), and to the work of WTO (price volatility, price distortions, gender), G20 (initiative on postharvest losses), COP22 (foresight modeling), the Global Panel on Agriculture and Food Systems for Nutrition (foresight modeling), and European Commission (price volatility, Economic Partner Agreements trade negotiations). As noted in subsequent sections of this report, FAO, IFAD, OECD, UNICEF, the World Bank, and the World Food Programme (WFP) used PIM research to inform design of their programs.

- *Supporting regional and national policy making in response to specific requests or through development of analytical tools and datasets for national researchers.* Outcomes under this pathway contribute significantly to the cross-cutting IDO "Enabling environment improved," as well as to other IDOs relevant to specific flagships. PIM supported the sustained engagement of IFPRI's Country Strategy Support Programs (CSSPs) with government counterparts in Bangladesh, Ethiopia, Egypt, Ghana, Malawi, Nigeria, and Pakistan, as well as engagement of other Centers with national counterparts (for instance CIMMYT's work to strengthen the foresight capacity of the Ethiopian Institute of Agricultural Research). Achievements in 2016 include findings on tenure and postharvest losses in teff in Ethiopia, evaluation of the Social Cash Transfers Pilot Programme, Tigray Region, Ethiopia, analysis of the determinants of public spending in Nigeria, and findings on the impact of market policies on smallholders in Malawi. Researchers supported by PIM contributed to national consideration of policies and regulations on seeds and germplasm in Ghana, Indonesia, Kenya, Malawi, Nigeria, and Tanzania, and to regional processes such as the Land Policy Initiative, a joint program of the African Union Commission, the African Development Bank, and the United Nations Economic Commission for Africa.

- *Designing and piloting innovations for direct use by implementing partners, including private firms, farmer organizations, and NGOs.* PIM worked with partners in the private sector on topics related to seed systems, extension, value chains, and insurance. PIM also worked with NGOs to improve delivery mechanisms of safety nets (e.g., World Food Programme in Bangladesh), to test value chain interventions (Heifer International, Rainforest Alliance, VECO), and to validate improved arrangements for natural resource tenure and governance (Foundation for Ecological Security) among others. Outcomes achieved through this impact pathway contribute to several IDOs, including "Enhanced

[1] This does not include WB/Fund Council support of the Virtual Information Platform (USD 457K) and the CGIAR gender postdoctoral fellowship (USD 100K), which are not part of the POWB.

smallholder market access," "Improved diets for poor and vulnerable people," and "Enhanced benefits from ecosystem goods and services."

- *Enhancing the quality of research via communities of practice and capacity building* (most closely aligned with the IDO "National partners and beneficiaries enabled.") The PIM-led communities of practice (foresight, value chains, collective action and property rights) continued to be active, and PIM co-hosted (with the CGIAR gender network and IFPRI) a workshop on approaches to enhancing the gender focus of agricultural research, reflecting PIM's contribution to capacity development on gender research within CGIAR. PIM also supported a number of training programs for national counterparts; examples include *inter alia* a training workshop on foresight for design and appraisal of the National Agricultural Investment Plans for Africa south of the Sahara, training on public expenditure analysis for research organizations in Senegal, and training through the African Growth and Development Policy Modeling Consortium (AGRODEP) network on tools for measuring postharvest losses and use of the Women's Empowerment in Agriculture Index.

C. Progress along the Impact Pathway

C.1 Progress toward Outputs

Please see below descriptions of a selection from among the 102 ISI journal publications, 70 databases, and other outputs (co)-produced by PIM in 2016.

Flagship 1 – Technological Innovation and Sustainable Intensification

See section A above for information on outputs related to the foresight work.

The PIM team (IFPRI, ICRAF) contributed synthesis pieces on rural advisory services (with a book in preparation for 2017), identifying areas where further evidence is needed and providing recommendations for improvement of extension practices. A 2015 article by an IFPRI-PIM researcher on comparative analysis of agricultural research and extension reforms in China and India received an Emerald Literati Award. A user guide on farmer-to-farmer extension was published based on lessons gained in the use of the volunteer farmer approach in the East Africa Dairy Development Project implemented in Kenya, Uganda and Rwanda. An IFPRI study in Uganda found that providing real-time and location-specific data on commodity markets to farmers facilitates their move toward more commercially-oriented and remunerative practices. In the case of maize, the intervention caused farmers to sell less on the market, but at significantly higher prices.

The ASTI book *Agricultural Research in Africa: Investing in Future Harvest* finds that total agricultural research spending increased modestly in real terms between 2001 and 2011, along with a more pronounced increase in the number of agricultural researchers, but that growth in spending is uneven, underinvestment widespread, and external funding volatile. The entry of young researchers is not yet sufficient to counter aging and high turnover among research staff. The new "ASTI Intensity Index" allows measurement of R&D intensity at the country level, a key element to calculate returns to R&D.

IFPRI researchers supported by PIM continued to contribute to the literature on new technology and biosafety, and in 2016 participated in a publication on GM crops. This work addresses the debate about genetic engineering techniques of the first 20 years, and highlights emerging technologies that add new complexities to the discussion.

The increased work on seed systems in 2016 resulted in three ISI journal articles (IFPRI), a book chapter (IFPRI), and a book (Bioversity International). The work of Bioversity International on community seed banks and

farmers' rights contributed to recommendations directed to the Governing Body of the International Treaty on Plant Genetic Resources for Food and Agriculture.

Flagship 2 – Agricultural Growth and Transformation at the National Level

PIM-supported work on agricultural transformation in Africa south of the Sahara yielded several topical publications. Case studies in five countries looked at the drivers of youth migration and policies used to promote youth employment; most of this work will be published in 2017. The teams also examined migration induced by climatic factors in Latin America and the Caribbean (LAC) and in Nepal.

The IFPRI team working on public expenditures continued to update the relevant data series and published analyses, including a book chapter on underinvestment in public agricultural research. From 2010 to mid-2016, the Statistics of Public Expenditure for Economic Development database (SPEED) has been cited over 60 times[2]; more than half of the publications used SPEED for cross-country and cross-regional analysis. The team contributed to a World Bank study on public spending priorities for African agriculture productivity growth.

A comprehensive assessment of the pace and derivation of agricultural productivity growth in Africa South of the Sahara incorporated geospatial data on production systems, quality of natural resources, population density, infrastructure, and market access to identify opportunities to accelerate productivity growth. Two other books published from work under Flagship 2, on the role of food subsidies in Egypt's economic development and on the Nigerian rice economy, have been well-received by targeted audiences.

Social accounting matrices were updated for Bangladesh, Egypt, Malawi, and Uganda. The work on mechanization (collaboration between IFPRI and CIMMYT) resulted in two policy briefs, one ISI journal article, and one discussion paper in preparation for the book on this topic expected for 2017. Tajikistan Spatial and Lebanon Spatial were launched, and updates were made to Yemen Spatial and Arab Spatial.[3] Arab Spatial recorded 2,258 views by 1,195 users between January and July, 2016, with approximately 60% corresponding to new users. A team studied the political economy of policies related to agricultural inputs in Ghana and found that a tighter overall national budget, cessation of sectoral budget support by key donors, and exchange rate shifts undermined support for Ghana's Fertilizer Subsidy Program by major importers, thereby opening space for consideration of change in design or eventual phase-out of the program.

Flagship 3 – Inclusive Value Chains and Efficient Trade

The 2016 book *Food Price Volatility and its Implications for Food Security and Policy* presents a collection of applied state-of-the art research on food security, risk, and uncertainty. To understand the impact of the global macroeconomic slowdown on poverty rates, an IFPRI team coupled the global computable general equilibrium (CGE) model MIRAGRODEP with single country models and household survey data to probe how global macroeconomic developments cascade down to the household level. The team finds that the slowdown will raise the estimated global rate of extreme poverty in 2030 from 4.8 percent (estimated in the absence of the slowdown) to 5.2 percent. This global effect is unevenly distributed across regions and countries, with

[2] Based on Google Scholar citation. These include 17 journal articles, 15 reports, 3 books, and several discussion papers. Journals include some of the most highly regarded within their respective fields, such as *Agricultural Economics*, *The American Political Science Review*, *the European Journal of Development Research*, *Food and Nutrition Bulletin*, and *World Development*. Reports using SPEED include those issued by FAO, IFPRI, the Inter-American Development Bank, UNDESA, and the World Bank.

[3] The Spatials are online information storehouses that aggregate geo-referenced food security and development information from a country or region and display the data on maps that users can zoom in on to the regional, national, sub-national, and pixel level.

disproportionate impact in Africa. These results were disseminated by several newspapers, including Pakistan's oldest and most widely read English-language newspaper, *Dawn*, and Bangladesh's *Daily Sun*.

The Ag-Incentives website (collaboration between FAO, IDB, IFPRI, OECD, World Bank, and others) was enhanced in preparation for the official launch (which will take place in May 2017). IFPRI researchers contributing to this effort found that Indian policies for oilseeds (rapeseed and groundnut) and biofuels (ethanol) created positive incentives (nominal rates of protection) for producers of sugarcane, sugar, groundnut, and rapeseed, and that the overall level of protection rises when by-products and processed commodities are included. This work suggests that Indian producers of sugarcane, groundnut, and rapeseed have benefited from the biofuel and oilseed policies. It also implies that these policies may be raising prices to consumers, and shifting consumption of oilseeds toward other products, such as imported palm oil.

The book *Innovation for Inclusive Value-Chain Development: Successes and Challenges*, an output of the PIM-led CGIAR value chains community of practice, addresses market access for smallholders; minimum levels of assets required to participate successfully in value chains; roles of farmers' organizations and contract farming; the performance of multistakeholder platforms; and attributes of successful interventions in value chains. The tools4valuechains website was enriched with several new tools for value chain analysis.

PIM continued to support work on improving measurement of postharvest losses and identifying interventions for their reduction. This work contributes to the Technical Platform on the Measurement and Reduction of Food Loss and Waste, a joint effort of FAO and IFPRI. Drawing on this work, the PIM Director delivered a keynote address at the 2016 Crawford Fund Annual Conference, "Waste Not, Want Not: The Circular Economy to Food Security." An AGRODEP training course was held on methodologies to measure postharvest losses.

Flagship 4 – Improved Social Protection for Vulnerable Populations

The social protection team continued its tradition of high-quality publications with practical applications in development programs. IFPRI researchers supported by PIM produced new evidence on the impact of social protection programs on nutrition and stunting. The role of behavior change communication was analyzed to improve program design in Bangladesh and Ethiopia. The report "Evaluation of the Social Cash Transfer Pilot Programme, Tigray Region, Ethiopia" – a collaboration between IFPRI, the Institute of Development Studies (University of Sussex), and Cornell University – was awarded the Best of UNICEF research award. IFPRI researchers seeking to understand whether social protection can reduce violence against women received recognition from the World Bank Group and the Sexual Violence Research Initiative for a research proposal on the effects of transfers and behavior change communication on intimate partner violence in rural Bangladesh; this research is proceeding in 2017.

In addition, the IFPRI social protection team started several studies in Ethiopia, including evaluations of the fourth phase of the Productive Safety Net Program (PSNP) and of UNICEF's Integrated Nutrition and Social Cash Transfer program, and a collaboration with World Vision International on their new Development Food Assistance Program. Teams supported collaboratively by PIM and A4NH examined the nutritional impacts of social protection in Bangladesh, Malawi, and Mali.

An IFPRI team tested an innovative microinsurance product that relies on pictures taken by wheat farmers in India to assess damage and trigger pay-outs. The team developed a smartphone app to collect standardized georeferenced pictures taken by farmers. The pictures taken throughout the wheat season were found to be of sufficiently high quality to capture changes in greenness and potentially other metrics reflecting damage.

Flagship 5 – Property Rights Regimes for Management of Natural Resources and Assets

A study by CIFOR used realist synthesis – a technique for reviewing evidence based on analysis of contextual factors – to draw generalizable conclusions from a literature review of how tenure regimes affect environmental outcomes. More specifically, this work addresses questions of when, how, where, and why tenure interventions are likely to result in positive environmental outcomes in marine resource systems.

WorldFish co-led a training workshop on multistakeholder dialogue for natural resource governance with International Land Coalition (ILC). This workshop was designed to build the capacity of the facilitators of the ILC National Engagement Strategies – which serve as multistakeholder platforms for improving policies and practices for land governance in twenty countries.

An IFPRI team working on inheritance of land in Ethiopia found that inheritance is an important avenue for securing land in remote areas and in areas with less vibrant land markets, but less so in peri-urban areas with more frequent transactions in land. People who inherit are less likely to migrate permanently to cities or over long distances, and are more likely to remain employed in agriculture. Inheritance does not have impact on the decision of young people to study.

C.2 Progress toward the Achievement of Research Outcomes and IDOs

Flagship 1 – Technological Innovation and Sustainable Intensification

Several CGIAR stakeholders used the tools and results from the work on foresight: RTB to prioritize research topics for Phase 2, CIMMYT to design future work on biotic stress resistance in crop varieties, and the ISPC to inform discussions on prioritization for CGIAR. PIM results informed major studies of FAO, OECD, and the Global Panel on Agriculture and Food Systems for Nutrition. In collaboration with CCAFS, PIM researchers engaged with the National Economic and Development Authority of the Philippines on adaptive strategies for agriculture to address climate change. Results helped the government decide not to renew quantitative constraints included in current rice trade policies, and other measures deriving from the research are planned for implementation in 2017. See section A above for more information on applications of the foresight work.

The Program for Biosafety Systems continued to support progress in development of legislative and regulatory frameworks for biosafety. Among specific outcomes in 2016: (i) the Indonesian Ministry of Agriculture enacted GM Feed Safety Guidelines; (ii) the National Biosafety Committee in Tanzania approved and issued a permit to conduct the first confined field trials for drought-tolerant GM maize in the country; and (iii) the National Biosafety Authority of Kenya approved two applications for general release (Bt cotton and Bt maize).

Flagship 2 – Agricultural Growth and Transformation at the National Level

The Ethiopian Development Research Institute used the Ethiopia social accounting matrix (SAM) to respond to requests from the Prime Minister to evaluate the economic impacts of introducing a carbon tax and to provide technical input into the country's Second Growth and Transformation Plan released in 2016. Although tracking of the use of the IFPRI-constructed SAMs is difficult, it was found that at least a dozen 2016 papers from non-IFPRI authors, including 7 journal articles, cite them.

Research on public expenditure contributed to the African Union Commission New Partnership for Africa's Development (NEPAD) guidance note on tracking, measuring, and reporting the levels and quality of government expenditures in the agricultural sector. The guidance note is being used by the Commission and the NEPAD Planning and Coordination Agency to assist countries to operationalize commitments under the Malabo Declaration.

Flagship 3 – Inclusive Value Chains and Efficient Trade

Implementation partners continue to use the value chains tools developed by PIM researchers to assist smallholders to access markets. The LINK method has been adopted by Catholic Relief Services (CRS), Heifer International, and VECO Mesoamerica. At the end of 2016 more than 30 applications of LINK were recorded in a total of 26 countries. In 2016, VECO Mesoamerica applied LINK in Honduras (vegetables value chain) and Nicaragua (cocoa and maize value chains), and CRS applied LINK in the vegetables, passion fruit, beans, honey, milk, and meat value chains in Nicaragua and in the coffee value chain in Colombia.

PIM's analyses of the Ethiopian Agricultural Transformation Agency programs on direct seed marketing by private sector retailers and input vouchers influenced the government's decision to expand these programs to other regions in the country.

The PIM team working on international trade provided analyses in support of the development of an Economic Partnership Agreement between the European Union and West African States. The National Assembly in Cote d'Ivoire and the Parliament in Ghana ratified their interim agreements in 2016.

Flagship 4 – Improved Social Protection for Vulnerable Populations

The social protection team found that the integration of behavior change communication interventions into social protection programs contributes toward meeting program objectives. Drawing on these findings, the Bangladesh Ministry of Women and Children Affairs and UNICEF-Ethiopia both incorporated these interventions into their programs. See sections A and C3 for information on achievements related to the social protection work in other countries.

The use of weather-based insurance products tested by PIM-supported scientists continued to expand in Uruguay. The product is now offered by the Uruguayan Ministry of Agriculture for all horticultural crops in four departments including Salto, the second most important horticultural region in the country. The private insurance company Banco de Seguros del Estado has financed the purchase of two new weather stations to be installed in the area.

Flagship 5 – Property Rights Regimes for Management of Natural Resources and Assets

Research and policy dialogues led by ICRAF in a collaboration between PIM and FTA have helped the Indonesian Directorate General of Social Forestry and Environment Partnership to design a decree enforcing the guidelines for rapid assessment of tenurial conflict in forest areas. In addition, the guidelines have been modified for a teaching curriculum and syllabus on conflict mediation. The curriculum, designed to assist forest managers from government agencies or private companies in identifying and solving forest tenure conflicts, has been endorsed by the Ministry of Environment and Forestry. In addition, other ICRAF research contributed to the Vietnam Administration of Forestry passing Decision 01/QD-TCLN-VP mandating the Forest Protection Department to oversee community forest management.

A team from Bioversity International supported the Peruvian Ministry of Environment in operationalizing the concept of Payments for Agrobiodiversity Conservation Services. Approaches to prioritization, establishment of risk thresholds, monitoring, participation of the private sector, and access to procurement channels for public food programs were integrated into the Ministry's Plan of Action for 2017.

IFPRI research on strengthening common property systems highlighted the importance of interactions among government agencies and programs and the resource users, often facilitated by nongovernmental organizations. The Foundation for Ecological Security, which assists village communities in protecting more than 2.6 million

acres of forestland and common lands in Andhra Pradesh, India, drew on this study to develop a monitoring and evaluation methodology for its work on the commons.

C.3 Progress toward Impact

Upon request from the Ethiopian Agricultural Transformation Agency, IFPRI researchers studied two programs aimed at increasing access of smallholder farmers to inputs: the Direct Seed Marketing program and the Input Voucher System program. The positive findings of the team about these programs contributed to the government's decision to continue and in one case expand them. The Input Voucher System program reached 2.8 million households in 2016.

A total of 85 development organizations (71 dairy cooperatives, 6 other cooperatives and producer organizations, and 8 NGOs and government organizations) have adopted the volunteer farmer trainer approach developed by ICRAF in Kenya, Rwanda, Tanzania, and Uganda, reaching 348,000 households.

PIM's research on social protection continues to be integrated into government and NGO programs that reach millions of poor households worldwide. For example, the PSNP in Ethiopia, to which PIM has contributed analytically throughout Phase 1, now reaches 7.6 million people, and the Vulnerable Group Development program, implemented by the Government of Bangladesh and WFP, now covers 1 million households.

Research on natural resource governance is conducted in partnership with Foundation for Ecological Security (FES), whose work on restoration of degraded lands has reached more than 10,000 villages in India (see discussion of Flagship 5 above). FES has incorporated several outputs of PIM research, including tools to spur collective action in FES "direct action sites." In 2015-2016, FES added 535 new direct action sites (where FES staff provide facilitation to communities), which have established protection plans on 60,118 hectares of land.

D. Gender Research Achievements

Selected achievements

An IFPRI study in Mozambique showed that programs conveying messages to smallholders on sustainable land management (SLM) practices were more cost-effective when the gender of the advisor or contact farmer was taken into consideration. Even with gender-sensitive selection of the messenger, securing adoption of SLM practices by female farmers is more expensive than securing an equivalent level of adoption by male farmers, which may reflect differential literacy rates among men and women within the sample.

An IFPRI study in Ethiopia found that prospects of inheriting land have a stronger impact on decisions about migration and occupational choice by young men than by young women. Work in Ghana and Tanzania (forthcoming) found that female-headed rural households are more likely to participate in nonfarm employment than male-headed households when education and other factors are held constant.

An IFPRI paper (forthcoming) explored how estimates of agricultural price distortions along value chains can be combined with gender data at the household and farm level to understand which distortions have differential impacts on men and women. Application of this methodology in Uganda to the case of maize, for which women dominate smallholder production, suggests that current distortions may benefit female producers. Gains in production, however, may be lost in consumption, as all consumers, including female maize farmers, face higher maize prices when they go to the market as buyers. Researchers added capacity for gender analysis to three of

the tools for value chain analysis. A gender lens for the 5 Capitals tool, 5Capitals-G,[4] was tested in Guatemala, India, and Peru (by ICRAF in partnership with Bioversity International). Gender-responsive Participatory Market Chain Approach (PMCA) tools were validated and used in Uganda in collaboration with the RTB-ENDURE project (CIP). VECO Mesoamerica tested a version of the gender-sensitive LINK method in Honduras and Nicaragua with support from FAO (CIAT). A tool developed by ICRISAT to identify agricultural activities and enterprises in which women predominate was piloted in India, Malawi, Zambia, and Zimbabwe. Current users include researchers at the Department of Agricultural Research Services, Malawi, the Grain Legumes CRP, Arizona State University, and IRRI; extension workers in Malawi and Zambia have expressed interest in the tool.

A journal article by an IFPRI team reported on a simulation exercise comparing willingness of women and men to purchase index-based insurance in Bangladesh. Women and men were equally willing to purchase agricultural insurance, although women showed preference for a lower level of insurance (and hence payment) than men.

Work on methods to generate high-quality sex-disaggregated data continued in 2016. A 3-day training was held in Nigeria on how best to administer survey instruments capturing age and gender-differentiated land tenure data. The training placed particular emphasis on nuances of questioning about perceptions of tenure security.

The Women's Empowerment in Agriculture Index (WEAI) community of practice continued to expand in 2016. Thirteen new projects and organizations adopted or modified the WEAI, bringing the total of organizations using the index to 60 (in 39 countries). A workshop hosted by the Ethiopian Ministry of Agriculture in collaboration with IFPRI and the Agricultural Transformation Agency brought together participants from the government, development partners, and research organizations to discuss women's empowerment in the agricultural sector based on application of the WEAI. The Millennium Challenge Corporation entered a cooperative agreement with IFPRI to use the WEAI for work in the Philippines. To that end the existing WEAI will be enhanced to capture the entire value chain in the target commodities, and used to assess women's empowerment along the value chains. The adapted WEAI will be added to the suite of tools available to assess gender issues in value chain analysis.

The second volume of the special issue of Agri-Gender on featuring research from participants in a write-shop hosted by the journal and PIM in 2015 came out in March 2016. The PIM gender team and the CGIAR gender network organized a webinar on lessons learned from use of the PIM-developed "Standards for collecting sex-disaggregated data for gender analysis" by CGIAR Centers and external partners. PIM co-hosted with the CGIAR gender network and IFPRI the workshop "Advanced techniques for incorporating gender in research design, data collection and analysis for economists and other quantitative social scientists."

Success and challenges in mainstreaming gender research

Based on the indicators for gender mainstreaming defined in Annex 2 of the CRP annual report template, PIM exceeds the requirements established by the former Consortium Office, as explained in the table below.

[4] Designed for joint learning among multiple stakeholders, the 5Capitals methodology assesses assets of human, social, natural, physical, and financial capital to gauge the poverty impacts of value chain interventions assisting smallholder households and the enterprises that link them with processors and buyers. 5Capitals-G is the newly developed gender-responsive version of the methodology.

Gender inequality targets defined	
Sex-disaggregated social data collected and used to diagnose important gender-related constraints in at least one of the CRP's main target populations	Many PIM projects collect and analyze sex-disaggregated data in order to identify gender-related constraints. For example, in 2016 the midline survey for the evaluation of the "Jigisemejiri" national cash transfer program (government of Mali) was conducted. Sex-disaggregated information was collected on assets, relationship dynamics, how transfers were split between male beneficiaries and their wife(s), women's status in the household, and experience of intimate partner violence. Another example is the baseline survey for the UNICEF Integrated Nutrition and Social Cash Transfer Program in Ethiopia, which included distinct male and female survey instruments, allowing for gender disaggregation for some income sources and assets.
The CRP has defined and collected baseline data on the main dimensions of gender inequality in the CRP's main target populations relevant to its expected outcomes (IDOs)	Several PIM projects collect baseline data on key dimensions of gender inequality, including gender differences in agricultural research staffing in developing countries and access to agricultural training, men's and women's migration patterns and their implications for agriculture, constraints to women's involvement in value chains, the gender dimensions of social protection programs and insurance products, and gender-based differences in tenure security and decision making over resources. In 2016 ICRISAT developed a tool to measure women's and men's levels of control over decision making processes (land allocation, land preparation, use of inputs, weeding, use of labor, harvesting, marketing, use of income) for their main crops.
CRP targets changes in levels of gender inequality to which the CRP is contributing or plans to contribute, with related numbers of men and women beneficiaries in main target populations	As indicated in the PIM Phase 2 proposal Performance Indicators Matrix, PIM has defined several milestones regarding the uptake of PIM gender research methods and guidelines and the use of PIM research on interventions for empowering women. PIM also commits to, and meets, targets for the percentage of flagship products and tools which include gender analysis (see Annex 1 and 1a, indicators 2, 3, 5, 6, 19, 20).
Institutional architecture for integration of gender is in place	
CRP scientists and managers with responsibility for gender in the CRP's outputs are appointed, have written TORs and funds allocated.	In 2016 Cheryl Doss, Senior Lecturer at Oxford's University, continued to serve as PIM's Gender Lead and as a member of the PIM Management Committee. She was supported by an Associate Research Fellow hired through the CGIAR Gender Postdoctoral Fellowship and (for the first half of the year) by a Senior Research Assistant in the PIM Program Management Unit. The Senior Research Assistant left in August 2016 to attend graduate school; in 2017 her duties are subsumed under the adjusted structure of PIM in Phase 2, and particularly the creation of Flagship 6.
Procedures defined to report use of available diagnostic or baseline knowledge on gender routinely for assessment of the gender equality implications of the CRP's flagship research products as per the Gender Strategy	Since 2015, PIM's annual activity progress reports contain information on: the proportion of activities collecting sex-disaggregated data among activities collecting primary data; the proportion of activities analyzing sex-disaggregated data; and the proportion of activities using findings to reduce identified gender inequities or to explicitly target women/girls.
CRP M&E system has a protocol for tracking progress on integration of gender in research	As described above, the PIM Program Management Unit monitors gender work across the portfolio by collecting indicators of progress in the annual activity progress reports. In addition to the information above, researchers are asked at research design stage to determine whether gender is relevant to the proposed research. If gender is not relevant, they are asked why. If gender is relevant, they are asked to which extent each deliverable will incorporate gender. These protocols are being harmonized with other CRPs adopting the MARLO M&E tool.

A CRP plan approved for capacity development in gender analysis	In 2016 as in previous years, PIM collaborated with the CGIAR gender network to build the capacity of CGIAR researchers to conduct gender analysis. In particular, PIM conducted a webinar on the standards for collecting sex-disaggregated data for gender analysis developed by PIM and endorsed by the Consortium Office, and hosted a workshop on "Advanced techniques for incorporating gender in research design, data collection, and analysis for economists and other social scientists," designed for CGIAR quantitative scientists who are not gender specialists. The PIM Engendering Data blog continued to provide a vehicle for CGIAR researchers to share new approaches to collecting and analyzing sex-disaggregated data. An IFPRI-PIM discussion paper on qualitative methods for gender research was issued.
The CRP uses feedback provided by its M&E system to improve its integration of gender into research	In 2016 for the first time, in order to assess progress in inclusion of gender analysis in the PIM portfolio, the PIM gender team conducted an analysis of a sample of the 2015 W1-2 deliverables with a gender component. This was in response to the recommendation from the PIM 2015 external evaluation that PIM validate the claims made by activity leaders in relation to gender in the activity reports. Overall the actual gender contribution was found to be qualitatively in line with the activity plans, although in some cases products incorporated different dimensions than initially envisaged.

E. Partnerships for Research and Impact

In 2016 the work of the Country Strategy Support Programs (CSSPs) continued to inform countries' development strategies, build country capacity, and have impact. In Ghana, the CSSP team organized a policy dialogue bringing together policy makers and development practitioners to offer actionable recommendations drawing on research on five topics (agricultural intensification; land, labor, and seeds; supply of services; macroeconomy and political economy; and transformation of the food system). The government's feedback on this event was positive and a similar event is planned for 2017. PIM support contributed to the growth of several partnerships in the Middle East and North Africa region. In addition to the PIM-supported partnership between IFPRI and the Egyptian Central Agency for Public Mobilization and Statistics (CAPMAS), which resulted in the release of a SAM for Egypt for the first time in 30 years, PIM's contribution to the policy research effort in the region has recently leveraged bilateral donor support: USAID will provide funding to the Map Egypt project in collaboration with the Egyptian Ministry of Agriculture with the aim of enhancing the effectiveness of agricultural project planning and implementation; similarly, GIZ will fund mapping of food and nutrition projects within Yemen Spatial. The IFPRI Egypt Strategy Support Program launched in 2016 will support development policy and project design and strengthen the capacity of Egyptian institutions in the areas of impact evaluation and monitoring.

PIM also contributed to regional and global partnerships. Through the newly signed partnership agreement between IFPRI and the Land Policy Initiative of the African Union with the United Nations Economic Commission for Africa and the African Development Bank, IFPRI and LPI will jointly pilot a study to track progress in implementation of the African Union declaration on land issues and challenges in ten countries. PIM has joined with WLE to facilitate the presence of CGIAR in the multi-partner Groundwater Solutions Initiative for Policy and Practice (GRIPP) launched in 2016 to support and scale up practical solutions for groundwater management for sustainable development and food security.

In 2016, PIM continued to make analytical contributions to the work of implementation partners. PIM contributed to the IFAD 2016 Rural Development Report on inclusive agricultural transformation. The book *Confronting Drought in Africa's Drylands: Opportunities for Enhancing Resilience* was released, with contributions from several organizations working under the guidance of a team from the World Bank Group, FAO, and PIM. A 2016 FAO paper co-authored by the PIM Gender Lead provides guidance on the collection of harmonized sex-disaggregated data on land rights.

In 2016 PIM collaborated with CCAFS, Livestock and Fish, Maize, RTB, and Wheat on application of the IMPACT model; with FTA on testing extension approaches; with Maize and Wheat on mechanization; with FTA and RTB on piloting value chain tools (LINK, 5Capitals-G; PMCA); with CCAFS on insurance; with A4NH on social protection, nutrition, and gender; and with FTA and WLE on tenure rights. As part of the foresight work, CIMMYT gathered partners at a workshop to discuss how biotic stresses can be taken into consideration in crop growth modeling in maize and wheat. Participants agreed to develop a pilot project on integrating biotic stress with crop models; concept notes will be submitted to Maize.

PIM works with the private sector on value chains and insurance. The LINK methodology has been used to develop inclusive business models between producers and private retailers in several cases. HDFC Ergo General Insurance has expressed interest in using the newly developed picture-based insurance product, and Seed Management Services provides the IT infrastructure necessary for implementing this product.

F. Capacity Building

PIM (co)-led, supported, and contributed to many capacity-building events (See Annexes 1 and 1a for details). Five training workshops on the IMPACT suite of models took place: one in Kenya focusing on CGIAR partners, two in the Philippines in collaboration with the National Economic and Development Authority, one in Senegal in association with the Regional Strategic Analysis and Knowledge Support System (ReSAKSS) for participants in the Comprehensive Africa Agriculture Development Program (CAADP) National Agricultural Investment Planning process, and one online for partners at the Korea Rural Economics Institute. Several participating Centers offered training on impact assessment. CIP, the National Institute of Agrarian Innovation of Peru, and the Learning Alliance of Peru, in collaboration with CIAT and IFPRI, organized a workshop on impact assessment for priority setting in agricultural research in the LAC region. Another event co-led by PIM, Michigan State University, and the Standing Panel on Impact Assessment of CGIAR (SPIA) addressed "Innovative methods for measuring adoption of agricultural technologies." Lessons learned from a collaboration between PIM and RTB to produce tools to make value chain interventions more gender-responsive were shared at a training workshop organized by the CGIAR gender network in partnership with Pennsylvania State University. The Program for Biosafety Systems assessed the status of biosafety capacity and procedures within CGIAR; findings were presented at a workshop to increase Centers' awareness of liability risks and biosafety management issues.

Following successful uptake of the LINK approach by Heifer International in the LAC region, in 2016 CIAT conducted training activities for Heifer International staff in Asia. The analytical capacity of Central Asian researchers was strengthened through two training workshops on applied econometric analysis as well as development and use of Tajikistan Spatial. IFPRI continued to work with the Association for Strengthening Agricultural Research in Eastern and Central Africa (ASARECA) on the use of geospatial data and tools to analyze technology adoption through innovative collection of survey data. The topics of the trainings organized by the CSSP teams for national partners included *inter alia* policy communication, statistics, spatial tools, and CGE modeling and SAMs. Examples of how national partners are using their enhanced capacity in policy and social science research include the National Economic and Development Authority of the Philippines using the IMPACT modeling apparatus in national discussions on climate change, and the Ethiopian Development Research Institute using the SAM data and training to provide input into the country's Second Growth and Transformation Plan. PIM teams trained journalists on biosafety issues in Nigeria and on food security and nutrition in Malawi. The STAARS project in collaboration with Cornell University provided mentorship to three African scholars who contributed to the body of knowledge on structural transformation of African agriculture. AGRODEP training courses were held on the WEAI and the Participatory Market Chain Approach.

2016 saw a significant expansion of the reach of the Food Security Portal (total number of users 485,734 since the launch of the platform in 2010). Two videos were produced; on SPEED and on the farmer-to-farmer extension approach.

G. Risk Management

Risk management in 2016 focused on the following areas:

Quality assurance for PIM-branded products: PIM faces reputational risk associated with the difficulty of assuring quality of PIM products and applying common standards across the portfolio.
Mitigating measure: Funded activities undergo reviews by flagship and cluster leaders and the PMU in the design stage. Multi-partner activities benefit from detailed planning to agree on contributions of team members, which also promotes quality. IFPRI books and briefs are reviewed by the IFPRI Publication Review Committee. In 2016 PIM management made significant progress in promoting the use of the PIM Branding and Acknowledgment Guidelines. As noted in the 2015 report, this is a step toward quality assurance, since it allows the PMU to monitor deliverables. The Independent Evaluation Arrangement of CGIAR participated in a session on quality standards and indicators at the 2016 PIM November meeting. PIM will greatly benefit from ISPC's expected issuance of systemwide indicators for assessing quality of research (forthcoming in 2017). Residual risk remains after these mitigating measures are implemented.

Knowledge of budget execution on the part of participating Centers: CRP management does not have access to real-time data on burn rates and deliverables. Budget tightening at several participating Centers has increased the risk that funds allocated by PIM may be re-assigned for purposes other than those approved in the Program Participant Agreements.
Mitigating measure: Real-time tracking of expenditures is a risk flagged in prior years, and requires a system-level solution. PIM management works closely with the IFPRI Finance unit to monitor the use of the IFPRI funds, and interacts with the other participating Centers to obtain estimates of spending at several points during the year. Upon receipt of the final reports for 2016, the PMU queries significant mismatch between reported expenditure and delivery and, if warranted, implements adjustments in the following year's allocations and work plans.

Tracking impact, and establishing indicators and targets for results: Establishing indicators and reporting against them is inherently challenging for policy-oriented research.
Mitigating measure: In 2016, PIM's Senior Research Fellow in the PMU actively participated in the CGIAR Monitoring, Evaluation, and Learning Community of Practice and its working group on indicators. PIM continues to invest in collecting evidence related to PIM outcomes, and identified targets for a number of sub-IDO indicators in its 2017 Plan of Work and Budget. In 2016, PIM made progress in adapting the MARLO online system to PIM's M&E processes; launch of MARLO is expected in the first half of 2017.

Managing staff turnover: In 2016 two flagship/cluster leaders left their positions for external appointments. This created challenges in timely reporting and continuity of leadership.
Mitigating measure: The PMU has managed the process of appointing replacements, and worked closely with the new members of the team to assist during the transition. As of 2017, flagship managers have been appointed to assist flagship leaders in the reporting and coordination functions.

H. Lessons Learned

Implementation of the program in 2016 yielded useful lessons, some of which are summarized below:

- Skills in policy-oriented research within CGIAR are uneven, and some researchers experienced difficulties delivering high-quality products in accordance with commitments. The PMU is working with the Center Deputy Directors General-Research and IFPRI Division Directors to identify capacities not tapped in Phase 1 and that could be brought into PIM's flagship teams to fill some gaps. In Phase 2 PIM will

organize an annual social science research conference to showcase areas of strength, identify needs for capacity development, and share information on methods across CGIAR.

- The process of developing the MARLO tool to monitor outputs and outcomes has been very useful in achieving a more focused program structure. In developing the Phase 2 portfolio, previously separate activities were grouped into aggregated projects contributing to shared outputs and outcomes. The W3/bilaterally funded work was also better integrated into the structure of the portfolio. The decision to move to an online M&E tool has therefore had the added benefit of enhancing the structural coherence of the program, hence addressing a weakness noted by the PIM 2015 external evaluation.
- In Phase 1 we observed limitations in the ability of Participating Centers' Focal Points to ensure coordination of inputs of their Centers with PIM outside their own areas of expertise. In 2017 the management of the program will transition to a new model with greater responsibility for flagship leadership teams. Center Focal Points have valued their participation in PIM in Phase 1 sufficiently to wish to remain involved in Phase 2. Therefore, in 2017 Center representatives will continue to have responsibility for communication on PIM matters within their Centers – but no role in coordinating reporting, which will be done at the flagship level.
- In Phase 1 flagship leaders lacked support for reporting and coordination functions. In Phase 2, PIM will fund up to 40% full-time equivalent of a flagship manager for each flagship. The flagship managers have been appointed and their terms of reference are available here.

Annex 1: CRP Indicators of Progress, with Glossary and Targets

CRPs	Indicator	Deviation narrative (if actual is more than 10% away from target)	Comment and explanations	2012		2013		2014		2015		2016	
				Target	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actual
All	1. Number of flagship "products" produced by CRP		See Annex 1a.	0	0	0	5	10	13	10	10	10	11
All	2. % of flagship products produced that have explicit target of women farmers/NRM managers		See Annex 1a.	0	0	0	60%	60%	67%	50%	60%	50%	55%

CRPs	Indicator	Deviation narrative (if actual is more than 10% away from target)	Comment and explanations	2012		2013		2014		2015		2016	
				Target	Actual	Target	Target	Target	Actual	Target	Actual	Target	Actual
All	3. % of flagship products produced that have been assessed for likely gender-disaggregated impact		See Annex 1a.	0	0	55%	80%	80%	83%	50%	80%	50%	55%
All	4. Number of ”tools” produced by CRP		See Annex 1a.	0	0	1	10	9	13	10	15	15	15

CRPs	Indicator	Deviation narrative (if actual is more than 10% away from target)	Comment and explanations	2012		2013		2014		2015		2016	
				Target	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actual
All	5. % of tools that have an explicit target of women farmers		See Annex 1a.	0	0	60%	30%	33%	46%	30%	43%	30%	60%
All	6. % of tools assessed for likely gender-disaggregated impact		See Annex 1a.	0	0	55%	60%	66%	62%	60%	50%	50%	67%
All	7. Number of open access databases maintained by CRP	See Annex 1a.	See Annex 1a.	0	89	TBD	125	135	91	80	75	70	70
All	8. Total number of users of these open access databases	See Annex 1a.	See Annex 1a.	NA	652,275	NA	2,679,057	3,000,000	55,000	50,000	449,311	75,000*	494,540 **
All	9. Number of publications in ISI journals produced by CRP		See Annex 1a.	NA	105	200	97	100	98	90	129	90	102

* The value of this indicator is difficult to predict; it is not clear that a target is useful.

** Includes 485,734 users of the IFPRI Food Security Portal.

CRPs	Indicator	Deviation narrative (if actual is more than 10% away from target)	Comment and explanations	2012		2013		2014		2015		2016	
				Target	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actual
1,2,3, 4, 6	10. Number of strategic value chains analyzed		See Annex 1a.	NA	16	16	13	16	57	40	58	40	93
1,5,6,7	11. Number of targeted agro-ecosystems analysed/characterised by CRP												
1,5,6,7	12. Estimated population of above-mentioned agro-ecosystems												
All	13. Number of trainees in short-term programs facilitated by CRP (male)	See Annex 1a.	See Annex 1a.			15,000	11,049	15,000	6,079	6,000	5,515	5,500	20,634
All	14. Number of trainees in short-term programs facilitated by CRP (female)	See Annex 1a.	See Annex 1a.			3,000	5,422	3,000	3,370	3,000	3,831	3,500	9,278
All	15. Number of trainees in long-term programs facilitated by CRP (male)		Number of Master's and PhD's not available.			110	199	110	203	100	66	70	76

CRPs	Indicator	Deviation narrative (if actual is more than 10% away from target)	Comment and explanations	2012		2013		2014		2015		2016	
				Target	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actual
All	16. Number of trainees in long-term programs facilitated by CRP (female)		Number of Master's and PhD's not available.			120	129	120	110	100	69	70	70
1,5,6,7	17. Number of multi-stakeholder R4D innovation platforms established for the targeted agro-ecosystems by the CRPs												
All	18. Number of technologies/NRM practices under research in the CRP (Phase I)		See Annex 1a.		159	20	0	17	39	30	69	30	61
All	19. % of technologies under research that have an explicit target of women farmers		See Annex 1a.		0	0	0	0	5%	5%	23%	15%	11%

CRPs	Indicator	Deviation narrative (if actual is more than 10% away from target)	Comment and explanations	2012		2013		2014		2015		2016	
				Target	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actual
All	20. % of technologies assessed for gender-disaggregated impact		See Annex 1a.			55%	0	55%	10%	10%	38%	20%	23%
1,5,6,7	21 Number of agro-ecosystems for which CRP has identified feasible approaches for improving ecosystem services and for establishing positive incentives for farmers to improve ecosystem functions as per the CRP's recommendations		See Annex 1a.										
1,5,6,7	22. Number of people who will potentially benefit from plans, once finalised, for the scaling up of strategies												

CRPs	Indicator	Deviation narrative (if actual is more than 10% away from target)	Comment and explanations	2012		2013		2014		2015		2016	
				Target	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actual
All, except 2	23. Number of technologies /NRM practices field tested (phase II)												
1,5,6,7	24. Number of agro-ecosystems for which innovations (technologies, policies, practices, integrative approaches) and options for improvement at system level have been developed and are being field tested (Phase II)												
1,5,6,7	25. % of above innovations/approaches/options that are targeted at decreasing inequality between men and women												

CRPs	Indicator	Deviation narrative (if actual is more than 10% away from target)	Comment and explanations	2012		2013		2014		2015		2016	
				Target	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actual
1,5,6,7	26. Number of published research outputs from CRP utilised in targeted agro-ecosystems												
All, except 2	27.Number of technologies/NRM practices released by public and private sector partners globally (phase III)												
All	28. Numbers of Policies/ Regulations/ Administrative Procedures Analyzed (Stage 1)		See Annex 1a.	50	34	35	51	50	153	50	35	35	24
All	29. Number of policies / regulations / administrative procedures drafted and presented for public/stakeholder consultation (Stage 2)		See Annex 1a.	0	10	10	0	2	11	2	15	3	11

CRPs	Indicator	Deviation narrative (if actual is more than 10% away from target)	Comment and explanations	2012		2013		2014		2015		2016	
				Target	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actual
All	30. Number of policies / regulations / administrative procedures presented for legislation (Stage 3)		See Annex 1a.	10	15	8	3	5	11	3	2	3	5
All	31. Number of policies / regulations / administrative procedures prepared passed/approved (Stage 4)		See Annex 1a.	0	NA	7	0	3	6	3	10	3	19
All	32. Number of policies / regulations / administrative procedures passed for which implementation has begun (Stage 5)		See Annex 1a	5	6	6	1	1	8	3	6	3	8

CRPs	Indicator	Deviation narrative (if actual is more than 10% away from target)	Comment and explanations	2012		2013		2014		2015		2016	
				Target	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actual
All	33. Number of hectares under improved technologies or management practices as a result of CRP research		See Annex 1a.		NA	NA	N/A	NA	NA	NA	NA	NA	NA
All	34. Number of farmers and others who have applied new technologies or management practices as a result of CRP research		See Annex 1a.		NA	NA	N/A	NA	NA	NA	NA	NA	NA

Annex 1a: Additional Documentation on Indicators

Indicator 1

List of PIM flagship products:

1. Article "Global and Regional Health Effects of Future Food Production under Climate Change: A Modelling Study" in *The Lancet*
2. Book *Farmers' Crop Varieties and Farmers' Rights: Challenges in Taxonomy and Law*
3. Book *Agricultural Research in Africa: Investing in Future Harvests*
4. Book *Agricultural Productivity in Africa: Trends, Patterns, and Determinants*
5. Book *The Nigerian Rice Economy: Policy Options for Transforming Production, Marketing, and Trade*
6. Book *Nutrition and Economic Development: Exploring Egypt's Exceptionalism and the Role of Food Subsidies*
7. Book *Food Price Volatility and its Implications for Food Security and Policy*
8. Book *Innovation for Inclusive Value Chain Development*
9. Article "A Conditional Cash Transfer Program in the Philippines Reduces Severe Stunting" in *Journal of Nutrition*
10. Special issue of *Journal of Gender, Agriculture and Food Security* on gender and policies, markets, and institutions (Part 2)
11. FAO working paper "Beyond Ownership: Tracking Progress on Women's Land Rights in Sub-Saharan Africa"

Indicators 2 and 3

Given that the PIM flagship products are publications and do not include the implementation of programs, it is not possible for them to have an explicit target of women farmers or natural resource managers. Thus, we interpret Indicator 2 as "focuses on women farmers or natural resource managers."

Similarly, PIM undertakes impact assessment for bodies of work, rather than individual publications, and thus the flagship products cannot usefully be assessed for likely impact or gender-disaggregated impact. Thus, we interpreted Indicator 3 as "includes gender analysis."

Flagship product (see Indicator 1)	Has explicit target of women farmers/NRM (Indicator 2)	Has been assessed for likely gender-disaggregated impact (Indicator 3)
Article "Global and regional health effects of future food production under climate change: A modelling study" in *The Lancet*	No. The study does not report the impact on women's health separately from that of men. The study finds modest decline in calories available due to climate change, and more significant shift in composition of the diet due to decline in consumption of fruits and vegetables. Whether this impact is differential for women and men is a potential area of inquiry in the future.	No. See indicator 2. The gender impact has not yet been assessed.
Book "Farmers' crop varieties and farmers' rights: challenges in taxonomy and law"	No. This volume on intellectual property rights associated with varieties developed by farmers does not distinguish legal or regulatory protections by gender.	No. See indicator 2. No distinctions by gender are addressed.
Book "Agricultural research in Africa: investing in future harvests"	Yes. The latest volume of research drawing on ASTI's updated data on agricultural technology in Africa addresses human resources and capacity in chapters 8, 9, and 10, with coverage of the gender and age of researchers.	Yes. The work analyzes the data to draw attention to under-representation of women among the cadre of African agricultural scientists, and shows modest improvement in new entrants into the profession. The work does not rigorously evaluate the impact of under-representation.
Book "Agricultural productivity in Africa: Trends, patterns, and determinants"	Yes. Chapter 6: "Factors Influencing the Effectiveness of Productivity-Enhancing Interventions: An Assessment of Selected Programs" includes attention to gender among the evaluative criteria for assessment of interventions.	Yes. The coverage of gender in the case studies of projects provides examples of how inclusion of gender in the design and implementation of projects contributed to their outcomes.
Book "The Nigerian rice economy: Policy options for transforming production, marketing, and trade"	No. The assessment of policy options for the rice sector in Nigeria does not include gender analysis.	No. The assessment of policy options for the rice sector in Nigeria does not include gender analysis.

Flagship product (see Indicator 1)	Has explicit target of women farmers/NRM (Indicator 2)	Has been assessed for likely gender-disaggregated impact (Indicator 3)
Book "Nutrition and economic development: Exploring Egypt's exceptionalism and the role of food subsidies"	Yes. The book investigates the high prevalence of stunting in Egyptian children (31% in 2011) and the concurrent global record for overweight and obesity among adult women (73 percent of all (nonpregnant) women 20 years of age and older overweight and 34 percent obese), and finds that both adverse trends can be attributed in significant part to failure of the food subsidy system.	Yes. The book shows that the design and implementation of the food subsidy system has had a differentially detrimental impact on the health of women.
Book "Food price volatility and its implications for food security and policy"	No. The work on food price volatility does not include differential impacts on men and women.	No. No gender analysis is undertaken.
Book "Innovation for inclusive value-chain development"	Yes. Several chapters address participation of women in value chains and innovations to increase participation. Chapter 14 provides quantitative tools to measure gender differences within nodes of value chains.	Yes. The book includes gender analysis and tools for gender analysis.
Article "A conditional cash transfer program in the Philippines reduces severe stunting" in *Journal of Nutrition*	No. Data are sex-disaggregated. Gender was included as a covariate but was not a focus of the study; gender bias in nutrition is rare, despite the impression from a few studies based on Northwest India.	No. The data are amenable to gender analysis, but that was not a focus of the current work.
Special issue of *Journal of Gender, Agriculture and Food Security* on gender and policies, markets, and institutions (Part 2)	Yes. Four papers, each of which has specific focus on gender. Topics include: Gender dynamics in cassava leaves value chains: The case of Tanzania; Women's experiences of cassava commercialization in Nigeria and Malawi; Smallholder milk market participation, dietary diversity and nutritional status among young children in Ethiopia; Rural women's participation in producer organizations: An analysis of the barriers that women face and strategies to foster equitable and effective participation.	Yes. The data are amenable to gender analysis, and the analysis is undertaken and reported in the papers.

Flagship product (see Indicator 1)	Has explicit target of women farmers/NRM (Indicator 2)	Has been assessed for likely gender-disaggregated impact (Indicator 3)
FAO working paper "Beyond Ownership: Tracking Progress on Women's Land Rights in Sub-Saharan Africa"	Yes. The paper addresses conceptual issues in defining women's land rights, and measurement techniques to track them.	Yes. Drawing on the empirical analysis, the study provides technical guidance on the collection of harmonized, quality sex-disaggregated data for generating land statistics on the various land rights that women and men have, beyond ownership. The methods will be applied in FAO's statistical series on landholding, among other applications.
% of flagship products:	**55%**	**55%**

These percentages are above the targets (50% for both indicators).

Indicator 4

List of PIM tools:

1. Platform to visualize and compare the results of different climate scenarios and adaptation strategies on groundnut productivity in Andhra Pradesh, India (updated)
2. Agricultural Science and Technology Indicators (ASTI) (updated), including new indicator to measure R&D intensity at the country level
3. Collection of good practice notes on extension (updated)
4. TeckTracker, a mobile app designed to collect georeferenced technology adoption and diffusion data (new)
5. Geospatial database of agricultural indicators for Africa South of the Sahara (new)
6. Tajikistan Spatial (new), Lebanon Spatial (new), Yemen Spatial (updated), Arab Spatial 4.0 (updated)
7. SPEED data visualization tool (updated)
8. Collection of Social Accounting Matrices (updated)
9. Food Security Portal for Africa south of the Sahara (updated), Food Security Portal for Latin America and the Caribbean (updated), Food Security Portal for India (updated)
10. Website on measuring policy environment for agriculture (updated)
11. Tools4valuechains.org (updated)
12. Women's crop' tool (new)
13. Gender-responsive Participatory Market Chain Approach (new)
14. Gender-responsive version of 5Capitals (tool for assessing poverty impacts of value chain development) (new)
15. Engendering Data blog (updated)

Indicators 5 and 6

Given that the PIM tools do not include the implementation of programs, it is not possible for them to have an explicit target of women farmers or natural resource managers. Thus, we interpret Indicator 5 as "focuses on women farmers or natural resource managers."

Similarly, the PIM tools do not lend themselves to impact assessment, and thus it is not possible for them to be assessed for likely impact or gender-disaggregated impact. Thus, we interpret Indicator 6 as "includes gender analysis."

Tool (see Indicator 4)	Has an explicit target of women farmers/NRM (Indicator 5)	Has been assessed for likely gender-disaggregated impact (Indicator 6)
Platform to visualize and compare the results of different climate scenarios and adaptation strategies on groundnut productivity in Andhra Pradesh, India (updated)	No. This tool does not focus on women farmers or natural resource managers.	No.
Agricultural Science and Technology Indicators (ASTI) (updated), including new indicator to measure R&D intensity at the country level	Yes. The ASTI data include coverage of the gender composition of the agricultural scientific community.	Yes. The tool lends itself to gender analysis of the capacity for agricultural research.
Collection of good practice notes on extension (updated)	Yes. These notes include coverage of methods particularly suitable for outreach to women farmers and natural resource managers.	Yes. The tools can be used to assess the success of various types of extension methods on women farmers.
TeckTracker, a mobile app designed to collect georeferenced technology adoption and diffusion data (new)	Yes. The tool tracks information about the respondent/user of technology, including gender.	Yes. Data are sex-disaggregated and amenable to gender analysis.
Geospatial database of agricultural indicators for Africa South of the Sahara (new)	No. This large geospatial database is at the landscape level, and not the household level. It is not sex-disaggregated.	No. The database is not amenable to gender analysis.
Tajikistan Spatial (new), Lebanon Spatial (new), Yemen Spatial (updated), Arab Spatial 4.0 (updated)	Yes. The Spatials include (among other variables) the gender gap index, which measures the gaps between men and women in four main categories: economic participation and opportunity; educational attainment; health and survival; and political empowerment. The index score ranges between 0 and 1. (Source: Bekhouche, Y., Hausmann, R., Tyson, D.L., Zahidi, S., Editors (2015). 'The Global Gender Gap Report 2015'. World Economic	Yes. Because of inclusion of the gender gap index, the Spatials facilitate mapping of gender issues together with other variables of interest.

Tool (see Indicator 4)	Has an explicit target of women farmers/NRM (Indicator 5)	Has been assessed for likely gender-disaggregated impact (Indicator 6)
	Forum, Geneva, Switzerland. Retrieved from: http://reports.weforum.org/global-gender-gap-report-2015/ [Accessed 01/28/2016]).	
SPEED data visualization tool (updated)	No. SPEED data on public spending do not distinguish gender.	No. If expenditures are separately identified as important for women, the SPEED data can assist in tracking them, but the data themselves are not sex-disaggregated or amenable to gender analysis.
Collection of Social Accounting Matrices (updated)	No. The SAMs do not primarily focus on women.	Yes. The team is adding gendered features to the SAMs on a sequential schedule. The gendered SAMs at present are for Ethiopia, Malawi, and Uganda. These SAMs separate labor by gender, and households by the gender of the de jure household-head. This sex disaggregation allows the SAMs, and models using them, to differentiate the impacts of agricultural policies on male and female workers and the households they live in.
Food Security Portal for Africa south of the Sahara (updated), Food Security Portal for Latin America and the Caribbean (updated), Food Security Portal for India (updated)	No. The food security portals do not primarily target women.	No. Data are not sex-disaggregated. The tool does not facilitate gender research.
Website on measuring policy environment for agriculture (updated)	No. The tool does not specifically focus on women.	No. Data are not sex-disaggregated.
Tools4valuechains.org (updated)	Yes. The portal contains tools that focus on participation of women along the value chain.	Yes. A number of tools and methods facilitate gender research.
Women's crop' tool (new)	Yes. This tool focuses specifically on women.	Yes. This tool facilitates gender research.
Gender-responsive Participatory Market Chain Approach (new)	Yes. This tool focuses on women and participation in value chains.	Yes. This tool facilitates gender research.

Tool (see Indicator 4)	Has an explicit target of women farmers/NRM (Indicator 5)	Has been assessed for likely gender-disaggregated impact (Indicator 6)
Gender-responsive version of 5Capitals (tool for assessing poverty impacts of value chain development) (new)	Yes. This tool focuses specifically on women.	Yes. This tool facilitates gender research.
Engendering Data blog (updated)	Yes. This blog features tools that focus specifically on women.	Yes. This blog features tools that facilitate gender research.
% of tools:	**60%**	**67%**

These percentages are above the targets (30% for Indicator 5, 50% for Indicator 6).

Indicator 7

The number of open-access databases we arrived at for 2016 is 70, equal to the target. The scope of the PIM databases ranges from socio-economic survey data to spatial data on crop production systems, statistics on public expenditures, prices of commodities, and social accounting matrices.

In the absence of guidance from the SMO on what should be counted as an "open-access database", we asked activity leaders to report individual, self-standing, datasets that were publicly accessible online in 2016 (whether some contents was added to them or not in 2016). The value of this indicator is probably under-estimated. In the future, if such an indicator is considered useful, it would be important for the SMO to provide precise guidelines about estimating this indicator in order to ensure that numbers reported are consistent between CRPs.

Indicator 8

As for the previous indicator, we faced some challenges in estimating the value of this indicator. No guidance is provided about how to define the type of user to be considered (unique users? repeat users?) For some databases, numbers of users are not recorded, and only data on numbers of hits and/or page views is available. To avoid adding up apples and oranges, we interpreted the indicator as "number of unique users", and limited our count to databases for which this value is available; therefore, the value of this indicator is under-estimated. Even so, the 2016 value (494,540) is much higher than the target (75,000); this reflects the inclusion of 485,734 users of the IFPRI Food Security Portal.

Indicator 9

The list of PIM 2016 ISI publications is available on the PIM website. The number for 2016 is 102, exceeding the target of 90. This list includes articles printed on paper in 2016 and articles first made available online in 2016, and excludes any article reported in the 2015 report.

Indicator 10

List of value chains analyzed:

Country/region	Commodity/value chain component	Center
Bangladesh	Fish	WorldFish
Bangladesh	Seeds	IFPRI
Bolivia	Asai fruit	CIAT
Bolivia	Honey	CIAT
Bolivia	Palm heart	Bioversity International
Bolivia	Potato	CIP
Bolivia	Seeds	Bioversity International
Brazil	Coffee	CIAT
Burkina Faso	Poultry	IFPRI
Burkina Faso	Seeds	Bioversity International
Cameroon	Kola nuts	ICRAF
Cameroon	Safou	ICRAF
Cameroon	Vegetable non timber forest products	CIFOR, ICRAF
China	Dairy	IFPRI
China	Maize	IFPRI
Colombia	Coffee	CIAT
Colombia	Quinoa	CIAT
Cote d'Ivoire	Cassava	IITA
Cote d'Ivoire	Maize	IITA
Cote d'Ivoire	Plantain	IITA
Cote d'Ivoire	Rice	IITA
Ecuador	Milk	CIAT
Ecuador	Potato	CIP
Ecuador	Toquilla straw	CIAT
Ethiopia	Coffee	IFPRI
Ethiopia	Small ruminant	ICARDA, ILRI
Ethiopia	Teff	IFPRI
Ethiopia	Wheat	IFPRI
Haiti	Coffee	CIAT
Haiti	Rice	CIAT
Honduras	Cocoa	CIAT
Honduras	Coffee	CIAT
Honduras	Vegetables	CIAT
India	Biofuel value chain	IFPRI
India	Brindleberry (Garcinia gummi-gutta)	Bioversity International
India	Kokum (Garcinia indica)	Bioversity International
India	Mango	Bioversity International

Country/region	Commodity/value chain component	Center
India	Oilseeds for rapeseed and groundnut	IFPRI
India	Pulses	ICRISAT, IFPRI
India	Seeds	IFPRI
Kenya	Dairy	WUR
Kenya	Fertilizers	IFPRI
Kenya	Mango	ICRAF
Kenya	Sorghum beer	ICRISAT
Malawi	Fertilizers	IFPRI
Malawi	Groundnut	IFPRI
Malawi	Maize	IFPRI
Malawi	Pulses	ICRISAT
Malawi	Soy	IFPRI
Mexico	Mezcal	CIAT
Nepal	Finger millet	Bioversity International
Nepal	Lentil	IFPRI
Nepal	Milk	IFPRI
Nepal	Seeds	Bioversity International
Nicaragua	Beans	CIAT
Nicaragua	Cocoa	CIAT
Nicaragua	Coffee	CIAT
Nicaragua	Honey	CIAT
Nicaragua	Maize	CIAT
Nicaragua	Meat	CIAT
Nicaragua	Milk	CIAT
Nicaragua	Passion fruit	CIAT
Nicaragua	Taro	ICRAF
Nicaragua	Vegetables	CIAT
Nigeria	Cassava	IITA
Nigeria	Cowpea	IITA
Nigeria	Maize	IITA
Nigeria	Fertilizers	IFPRI
Pakistan	Seeds	IFPRI
Peru	Alpaca	CIAT
Peru	Alpaca fiber	CIAT
Peru	Banana	CIAT
Peru	Camu camu and other tree fruits	ICRAF
Peru	Cocoa	ICRAF
Peru	Potato	CIP
Senegal	Fonio (Digitalia exilis)	IITA
Senegal	Groundnut	IITA

Country/region	Commodity/value chain component	Center
Senegal	Improved species of chicken	IITA
Senegal	Mango	IITA
Senegal	Small ruminant	ILRI
Senegal	Wheat	IITA
Sierra Leone	Cassava	IITA
The Gambia	Groundnut	IITA
The Gambia	Maize	IITA
The Gambia	Rice	IITA
Uganda	Banana	CIP
Uganda	Cassava	CIP
Uganda	Fertilizers	IFPRI
Uganda	Sweetpotato	CIP
Vietnam	Beef	ILRI
Vietnam	Dairy	IFPRI
Vietnam	Vegetables	CIAT
Zambia	Groundnut	ICRISAT

Total: 93 value chains (above target of 40)

Indicators 13-14

The total number of trainees in short term programs in 2016 is 29,912, which is higher than the target (9,000); with regards to sex-disaggregation, the number of female trainees (9,278) is higher than the target (3,500), as is the number of male trainees (20,634 versus 5,500). This reflects the very high number of farmers trained under the East Africa Dairy Development Project.

Trainings were provided in various subject matters, among which: foresight/crop/CGE modeling, seed systems, biosafety issues, agricultural practices, value chain analysis tools, postharvest losses, use of the Women's Empowerment in Agriculture Index, data collection, statistical tools, policy analysis and communication, impact evaluation.

Indicators 15-16

The total number of trainees in long term programs in 2016 is 146, which is above the target (140). As in 2015, in 2016 there were approximately as many female long term trainees as male long term trainees.

Indicator 18

List of technologies assessed:

A) Technologies/practices assessed as part of the foresight work (17):

Crop	Trait/variety/practice	Center	Region/Country
Banana	Tissue culture	Bioversity International	Uganda
Beans	Drought tolerance	CIAT	Central America (8 countries), North Africa (5 countries), South America (10 countries), and Sub-Saharan Africa (26 countries)
Dairy animals	Breeding and reproductive technologies	ILRI	India, Kenya, Nicaragua, Tanzania
Forage	6 Brachiaria species	CIAT	East Africa (Burundi, Ethiopia, Kenya, Rwanda, Tanzania, Uganda)
Maize	Biotic stress resistance	CIMMYT	Africa and Asia
Maize	High yielding hybrids	CIMMYT	Kenya
Maize	Drought and heat tolerance	CIMMYT	India, Kenya, Ethiopia, Zimbabwe
Pearl millet	Drought and heat tolerance	ICRISAT	India, Mali, Niger
Potatoes	Heat tolerance	CIP	Bangladesh, China, Kyrgyzstan, India, Nepal, Pakistan, Tajikistan, Uzbekistan
Potatoes	Drought tolerance	CIP	Bangladesh, China, Kyrgyzstan, India, Nepal, Pakistan, Tajikistan, Uzbekistan
Rice	C4	IRRI	South Asia (Bangladesh, India, Nepal, Pakistan, Sri Lanka), Southeast Asia (Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Thailand, Vietnam)
Rice	Drought tolerance	IRRI	South Asia (India, Bangladesh, Pakistan, Nepal, Sri Lanka)
Rice	Submergence rice	IRRI	South Asia, Southeast Asia
Sorghum	Various hybrids	ICRISAT	Global
Soybean	Improved cultivars	IITA	Africa
Sweet potatoes	2 orange flesh varieties	CIP	Kenya, Tanzania
Wheat	Biotic stress resistance	CIMMYT	Not defined

B) Other technologies/practices assessed (44):

Technology/practice	Center	Region/Country
35 GM variety / trait combinations (risk preparedness)	IFPRI	Global
Aflatoxin control	IFPRI	Africa
Agile potato	CIP	Bangladesh, India
Banana wilt management	Bioversity International	Uganda
Bt Cotton	IFPRI	Pakistan
Bt cotton	IFPRI	Kenya, Nigeria
Bt cowpea	IFPRI	Malawi
Bt maize	IFPRI	Kenya, Tanzania
Certified wheat seed and row planting	IFPRI	Ethiopia
Climbing beans	IFPRI	Rwanda
Conservation agriculture	ICARDA	Tunisia
Crop insurance in combination with drought tolerant rice	IFPRI	Bangladesh
Disease resistant GMO banana	IFPRI	Africa
Drip irrigation	ICRISAT	India
Drip irrigation	IFPRI	Ethiopia, Ghana, Tanzania
Drought tolerant maize	IFPRI	Africa
Fodder shrubs and other dairy feeds	ICRAF	East Africa
Fuel efficient cookstoves	IFPRI	Malawi
Groundwater irrigation	ICRISAT	India
Herbicides	IFPRI	Ethiopia
High yielding rice varieties	IFPRI	Nigeria
Hybrid rice	IFPRI	Bangladesh
ICT dissemination tools (television and mobile phones)	ICRAF	Kenya
ICT message services for farmers	IFPRI	Ghana, Uganda
Improved chicken breed	IFPRI	Africa
Improved rice varieties	IFPRI	Ghana
Input voucher credit mechanism	IFPRI	Ethiopia
Irrigation	ICARDA	Tunisia
Irrigation in rice	IFPRI	Ghana

Technology/practice	Center	Region/Country
Irrigation (vegetables)	IFPRI	Ghana
Livestock fodder, biological nitrogen fixation, integrated soil fertility management, water management, postharvest loss, storage and packaging	IFPRI	Ethiopia, Ghana, Malawi, Mali, Tanzania, Zambia
Maize hybrid varieties	IFPRI	Ghana
Mechanization	IFPRI, CIMMYT	Bangladesh, China, Ethiopia, Ghana, Kenya, Nepal, Nigeria, Sri Lanka
Picture-based insurance payouts	IFPRI	India
Pollination and pest control ecosystem practices	IFPRI	China, Cambodia, Vietnam
Poultry breeding and vaccines	IFPRI	Ghana
Quality protein maize	IFPRI	DRC, Tanzania
Row planting of teff	IFPRI	Ethiopia
Small-scale irrigation	IFPRI	Nigeria
Soil testing information	IFPRI	India
Stripe and rust resistant wheat	IFPRI	Global
Vaccine for sheep and goats	IFPRI	Africa
Vitamin A sweet potato	IFPRI	Africa
Water harvesting	ICRISAT	India

Total number of technologies: 61 (above target of 30)

Indicators 19-20

Technology	Center	Region/Country	Has an explicit target of women farmers/NRM (Indicator 19)	Has been assessed for likely gender-disaggregated impact (Indicator 20)
Technologies/practices assessed as part of the foresight work (see Indicator 18) except for banana tissue culture	Various (see Indicator 18)	Various (see Indicator 18)	No	No
Banana tissue culture	Bioversity International	Uganda	No	Yes. Compared women and men management of disease.
35 GM variety / trait combinations (risk preparedness)	IFPRI	Global	No	No
Aflatoxin control	IFPRI	Africa	No	No
Agile potato	CIP	Bangladesh, India	No	Yes. Women's labor time implications are assessed.
Banana wilt management	Bioversity International	Uganda	Yes. Study focuses on gender differences in managing the plant disease	Yes. Women and men farmer use of different practices is documented.
Bt Cotton	IFPRI	Pakistan	No	No
Bt cotton	IFPRI	Kenya, Nigeria	No	No
Bt cowpea	IFPRI	Malawi	No	No
Bt maize	IFPRI	Kenya, Tanzania	No	No
Certified wheat seed and row planting	IFPRI	Ethiopia	Yes. Gender was used to select farmers in control and treatment groups.	Yes. Results differentiated men and women's results on yields.
Climbing beans	IFPRI	Rwanda	No	No
Conservation agriculture	ICARDA	Tunisia	No	No
Crop insurance in combination with drought tolerant rice	IFPRI	Bangladesh	No	No

Technology	Center	Region/Country	Has an explicit target of women farmers/NRM (Indicator 19)	Has been assessed for likely gender-disaggregated impact (Indicator 20)
Disease resistant GMO banana	IFPRI	Africa	No	No
Drip irrigation	ICRISAT	India	No	No
Drip irrigation	IFPRI	Ethiopia, Ghana, Tanzania	Yes. Focus of study is on women's access to irrigation as compared to men.	Yes. Focus of study is on women's access to irrigation technology and resulting empowerment effects.
Drought tolerant maize	IFPRI	Africa	No	No
Fodder shrubs and other dairy feeds	ICRAF	East Africa	Yes. Several partner programs have gender targets.	Yes. Data shows sex distribution of voluntary farmer trainers and farmers reached.
Fuel efficient cookstoves	IFPRI	Malawi	Yes. A key objective was to examine effect on women and children health as well as women's labor time.	Yes. Labor time spent on collecting fuelwood was a variable analyzed in the study, comparing those with and without the technology.
Groundwater irrigation	ICRISAT	India	No	No
Herbicides	IFPRI	Ethiopia	No	Yes. Effect of observed increase in herbicide use on women's time spent on weeding was assessed.
High yielding rice varieties	IFPRI	Nigeria	No	No
Hybrid rice	IFPRI	Bangladesh	No	No
ICT dissemination tools (television and mobile phones)	ICRAF	Kenya	No	Yes. Sex of people who followed up to seek further information after being exposed to dissemination messages was analyzed.
ICT message services for farmers	IFPRI	Ghana, Uganda	No	Yes. Effect of messaging on decision making and other aspects of the WEAI are analyzed.
Improved chicken breed	IFPRI	Africa	No	No
Improved rice varieties	IFPRI	Ghana	No	No
Input voucher credit mechanism	IFPRI	Ethiopia	No	Yes. The use of the vouchers, repayment rate and decision making was compared between men and women.

Technology	Center	Region/Country	Has an explicit target of women farmers/NRM (Indicator 19)	Has been assessed for likely gender-disaggregated impact (Indicator 20)
Irrigation	ICARDA	Tunisia	No	No
Irrigation in rice	IFPRI	Ghana	No	No
Irrigation (vegetables)	IFPRI	Ghana	Yes. Discusses opportunity for those engaged in flood recession agriculture, and especially women, to profit from vegetable cultivation.	No
Livestock fodder, biological nitrogen fixation, integrated soil fertility management, water management, postharvest loss, storage and packaging	IFPRI	Ethiopia, Ghana, Malawi, Mali, Tanzania, Zambia	Yes. Africa Rising has incorporated a gender action plan into Phase 2.	Yes. A number of sex-disaggregated variables are collected, including control of land and labor allocation.
Maize hybrid varieties	IFPRI	Ghana	No	No
Mechanization	IFPRI, CIMMYT	Bangladesh, China, Ethiopia, Ghana, Kenya, Nepal, Nigeria, Sri Lanka	No	Yes. Sex disaggregated data analyzed in some countries
Picture-based insurance payouts	IFPRI	India	No	No
Pollination and pest control ecosystem practices	IFPRI	China, Cambodia, Vietnam	No	No
Poultry breeding and vaccines	IFPRI	Ghana	No	No
Quality protein maize	IFPRI	DRC, Tanzania	No	No
Row planting of teff	IFPRI	Ethiopia	No	Yes. Effect of row planting on labor of men and women was assessed.
Small-scale irrigation	IFPRI	Nigeria	No	No
Soil testing information	IFPRI	India	No	No

Technology	Center	Region/Country	Has an explicit target of women farmers/NRM (Indicator 19)	Has been assessed for likely gender-disaggregated impact (Indicator 20)
Stripe and rust resistant wheat	IFPRI	Global	No	No
Vaccine for sheep and goats	IFPRI	Africa	No	No
Vitamin A sweet potato	IFPRI	Africa	No	No
Water harvesting	ICRISAT	India	No	No
% of technologies:			**11%**	**23%**

These percentages are roughly in line with the targets (15% for Indicator 19; 20% for Indicator 20).

Indicators 28-32

Flagship #	Act #	Activity/project title	Policy	Country	Stage	Number of policies
1	49	Comparative science, technology, and innovation systems in developing-country agriculture	Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits	Global	1	1
1		Cereal Systems Initiative for South Asia	Soil Health Card Scheme	India	1	1
1	98	BioSight (tools for assessing tradeoffs around sustainable agricultural intensification)	Irrigation policies	India	1	1
1		Program for Biosafety Systems	Approval of general release of Bt cotton and Bt maize	Kenya	4	2
1		Program for Biosafety Systems	Approval of general release of Bt cotton	Malawi	4	1
1		Program for Biosafety Systems	Approval of VR banana confined field trial	Malawi	4	1
1		Program for Biosafety Systems	Bt cowpea confined field trial	Malawi	5	1
1		Program for Biosafety Systems	Biosafety regulations and legislation	Nigeria	5	1
1			Fadama program	Nigeria	2	1
1	97	Global Futures and Strategic Foresight	National climate change adaptation policies and strategies (Philippine Development Plan 2017-2022…)	Philippines	4	1
1		Cereal Systems Initiative for South Asia	Fertilizer policies	South Asia	1	1
1		Program for Biosafety Systems	Drought-tolerant maize confined field trial	Tanzania	5	1
2		Egypt Strategy Support Program	Food subsidies	Egypt	5	1
2		Ghana Strategy Support Program	Irrigation schemes	Ghana	1	1
2		Ghana Strategy Support Program	Fertilizer subsidies	Ghana	1	1

Flagship #	Act #	Activity/project title	Policy	Country	Stage	Number of policies
2		Ghana Strategy Support Program	Seed systems policies	Ghana	1	1
2	148	Mechanization and agricultural transformation: South-South learning and knowledge exchange	Mechanization policy	Ghana, Nigeria, Kenya, Ethiopia	2	4
2		Malawi Strategy Support Program	Export bans and minimum farmgate prices	Malawi	2	2
2			2072 Constitution of Nepal	Nepal	1	1
2		Pakistan Strategy Support Program	Amendment to the 1976 Seed Act	Pakistan	5	1
2		Pakistan Strategy Support Program	Plant Breeders Rights Act	Pakistan	2	1
3			Export taxes	Argentina	1	1
3	126	Food value chain upgrading for food safety in transforming food markets	Food safety regulations	China	2	1
3		Ethiopia Strategy Support Program	ATA Direct Seed Marketing program	Ethiopia	3	1
3		Ethiopia Strategy Support Program	Input voucher scheme	Ethiopia	3	1
3	177	Economic impact of market facilities in central highlands of Ethiopia	Ethiopian Livestock Master Plan	Ethiopia	1	1
3	168	Applications of value chain tools in conjunction with measurement of distortions	Biofuel and oilseed policies	India	1	2
3	149	Exploring local food networks in Peru—a base for tool development and joint learning	Review of policies and program effects on local food systems	Peru	1	1
3	162	Analysis of global and regional trade policy agreements and unilateral trade policy reforms	Economic Partnership Agreement EU WA: Free Trade Agreement between the European Union and West Africa		3	2

Flagship #	Act #	Activity/project title	Policy	Country	Stage	Number of policies
3	162	Analysis of global and regional trade policy agreements and unilateral trade policy reforms	Economic Partnership Agreement EU SADC: Free Trade Agreement between the European Union and Southern African Development Community		2	1
4	69	Expanding the impact of social protection	Vulnerable Group Development (VGD) program	Bangladesh	4	1
4	69	Expanding the impact of social protection	Safety nets programme (Income Support Programme for the Poorest…)	Bangladesh	4	1
4	69	Expanding the impact of social protection	Productive Safety Net Programme (PSNP 3)	Ethiopia	5	1
4	69	Expanding the impact of social protection	Productive Safety Net Programme (PSNP 4)	Ethiopia	1	1
4	63	Innovative insurance products for the rural sector	State Agricultural Insurance Programs	India	1	1
4	69	Expanding the impact of social protection	Programme de Filets Sociaux du Mali Jigisemejiri	Mali	1	1
4	63	Innovative insurance products for the rural sector	Ministry of agriculture policy on supporting crop weather insurance	Uruguay	5	1
5	44	What works to secure land tenure for women, youth and other vulnerable groups?	Land Policy Initiative (LPI)	Africa	1	1
5	44	What works to secure land tenure for women, youth and other vulnerable groups?	Second-level land certification program	Ethiopia	2	1

Flagship #	Act #	Activity/project title	Policy	Country	Stage	Number of policies
5	44	What works to secure land tenure for women, youth and other vulnerable groups?	Land use and transfer policy	Ethiopia	1	1
5		"In our own hands" Community seed banks: origins, evolution and prospects	Community seed bank policies	Global	1	1
5	143	Securing the commons	International Treaty on Plant Genetic Resources for Food and Agriculture	Global	1	1
5	154	Synthesis review of impacts of water and energy policies on water use efficiency in farming - equity implications	Prime Minister's Agricultural Irrigation Scheme	India	2	1
5	143	Securing the commons	Decree No 4 on Guidelines for Forest Tenurial Conflict Resolution	Indonesia	4	1
5	44	What works to secure land tenure for women, youth and other vulnerable groups?	Land rights protection programs	Mozambique	1	1
5		Nigeria Strategy Support Program	Systematic Land Tenure Regularization (SLTR) program	Nigeria	1	1
5	174	Facilitating shared governance of common pool genetic resources and overcoming fragmented institutional landscapes through the upscaling of farmer conservation and sustainable use incentive mechanisms	Law No. 30215 "Law of Mechanisms for Retributions for Ecosystem Services"	Peru	4	1

Flagship #	Act #	Activity/project title	Policy	Country	Stage	Number of policies
5	174	Facilitating shared governance of common pool genetic resources and overcoming fragmented institutional landscapes through the upscaling of farmer conservation and sustainable use incentive mechanisms	Food Purchase Programmes	Peru	1	1
5	143	Securing the commons	National community seed bank policy	South Africa	5	1
5	143	Securing the commons	Community Forest Management Policy	Vietnam	4	1
1, 2		Various	Seed systems policies	Bangladesh, Burkina Faso, India, Bolivia, Nepal, Pakistan, Uganda, Uzbekistan	1	8
		Malawi Strategy Support Program	2016 National Agricultural Policy	Malawi	4	1
		Malawi Strategy Support Program	Farm Input Subsidy Program	Malawi	3	1

Total:

- **Stage 1: 24 policies**
- **Stage 2: 11 policies**
- **Stage 3: 5 policies**
- **Stage 4: 19 policies**
- **Stage 5: 8 policies**

Total across stages: 67, above the target of 47. Differences between targets and actual numbers by stage reflect the difficulty of predicting the progression of policies from one stage to the next.