



RESEARCH  
PROGRAM ON  
Policies,  
Institutions,  
and Markets

Led by IFPRI

CGIAR RESEARCH PROGRAM ON  
POLICIES, INSTITUTIONS, AND MARKETS (PIM)

# Proposal for Phase 2 (2017–2022)

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## 1.0 CRP Narrative

### 1.0.1 Rationale and scope

#### **Why PIM? The Role of Policies, Institutions, and Markets in meeting the challenges of agrifood systems<sup>1</sup> in the 21<sup>st</sup> century**

Major episodes of agricultural growth in the last half of the 20<sup>th</sup> century can be explained by the synergistic interaction between policy reforms and investment.<sup>2</sup> For example, Brazil's relaxation of policies that penalized agriculture (exchange rate, public investment, and others) and simultaneous creation of a modern agricultural research system launched the country as a major agricultural exporter. China's institutional reforms in the late 1970's (dismantling of the commune system) and subsequent investments in agriculture initiated processes that moved an estimated 600 million people out of poverty in two decades. Economywide reforms in many African countries in the 1990's brought increased agricultural growth in the 2000's, but momentum faltered due to lack of accompanying investments in agriculture and incomplete reforms. **Returns to investments in agriculture depend on the policy environment in which they are undertaken.** CGIAR's portfolio achieves impact through synergistic effects of technical change, policy reforms, and institutional innovation. Strong synergies between reforms and agricultural research (including biological, social, physical, and mechanical research) can transform the wealth and health of millions of poor people.

CGIAR's Strategy and Results Framework (SRF) positions the system to deliver research contributing to reduced poverty, improved nutrition and health, and a sound natural resource base. Ambitious targets for 2030 and intermediate milestones in 2022 can only be met if policy and institutional reforms accompany the research undertaken by CGIAR and partners. **The CGIAR Research Program on Policies, Institutions, and Markets (PIM) works to assist key actors in agrifood systems to understand and act on the reforms needed** to accomplish these objectives. As noted in the SRF, the context for CGIAR's work includes a daunting list of **grand challenges** associated with management of food and agriculture: competition for land; degradation and depletion of soil and water; loss of biodiversity; climate change; unsustainable harvest of forests, fish, and aquatic products; loss of products in the field and on the hoof; and contamination of food *en route* from producer to consumer. Each of these challenges has a policy and/or institutional dimension contributing to it. Solutions to each, in turn, require combinations of reforms in policies and institutions and new flows of investment.

**The evidence that PIM provides to underpin policy reform and institutional change matters because public funds for investment are limited, and choices carry significant trade-offs.** Countries face different circumstances and resource endowments, and policy options must be based on evidence and tailored accordingly. New awareness of climate change and commitments to zero deforestation and gender goals require new analytical insights. How do millions of smallholders best fit into evolving agrifood systems? Where can young people entering the labor force in large numbers find jobs? Policy makers facing these

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<sup>1</sup> The agrifood system includes all processes and actors involved in feeding people: growing, harvesting, processing, packaging, transporting, marketing, consuming, and disposing of food and food packages. It also includes the inputs needed and outputs generated at each step. Agrifood systems affect the incomes of those employed in them, the nutrition and health of consumers, and the quality of the natural resource base. (<http://blogs.cornell.edu/garden/files/2011/05/cgbl-dofs-curriculum5.pdf>).

<sup>2</sup> References supporting statements in this section can be found in the list of references, but are not noted individually to conserve space.

and many other challenges need evidence to weigh difficult choices. Evidence also empowers civil society groups to question public officials when changes favor the political elites that support office-holders, rather than the broader society including the poor and vulnerable.

PIM already serves CGIAR and the wider community of researchers and development practitioners as a source of analytical insight to underpin reforms. **The [recent independent evaluation of the program conducted under the auspices of the Independent Evaluation Arrangement of CGIAR](#) concludes “that PIM has added sufficient value to the CGIAR’s research on policies, institutions, and markets to warrant the continuation of a CRP like PIM in the second round of CRPs [and] that the International Food Policy Research Institute (IFPRI) should continue to host the PIM Management Unit.”**

Work undertaken subsequent to the evaluation continues the record of strong delivery. For example, [recent results](#) using the tools for foresight modeling (supported by PIM and CCAFS) reported in *The Lancet* show that climate change will lead to a modest reduction of per-person global food availability, with changes in the energy content and composition of diets that will be associated with substantial negative health implications. PIM’s work on social protection is assisting the Government of Ethiopia to assess the response of the Productive Safety Net Program to the current El Niño-related drought. Work on gender and landownership in Africa South of the Sahara and in Asia has revealed that joint ownership by men and women is more prevalent than earlier thought; this work is changing the way FAO and other global bodies collect data on landholding. PIM has developed new methods to measure postharvest losses, and contributed to the launch in December 2015 of the [Technical Platform on the Measurement and Reduction of Food Loss and Waste](#), a joint undertaking of IFPRI and FAO at the request of the G20 summit in Turkey. The agreement on elimination of export subsidies at the WTO Nairobi Ministerial Conference in December 2015, negotiated over ten years and informed by continuous modeling supported by PIM during Phase 1, is expected to boost agricultural investment in low income countries by 0.5 percent annually.

Work of this quality will continue in Phase 2. The combination of strong performance and lessons learned during Phase 1 provides a solid foundation for the next phase.

### **Scope of the program, and contribution to system-level impact pathways**

Within the architecture of the CGIAR portfolio, PIM is one of four **Integrating Programs** that address issues cutting across the eight commodity-specific Agrifood System Programs. PIM’s mandate to address the enabling environment is very broad, and necessitates selectivity – with emphasis on areas where PIM has a comparative advantage and can make a significant difference. PIM has six such areas, called **flagships**. Flagship 1 on Technological Innovation and Sustainable Intensification addresses foresight modeling and the policy underpinnings of innovation in agriculture. Flagship 2 on Economywide Factors Affecting Agricultural Growth and Rural Transformation includes attention to rural income generation, public investment, and the political economy of agricultural and rural policy. Flagship 3 on Inclusive and Efficient Value Chains examines the policy and enabling environment in which value chains function, interventions to strengthen them and make them inclusive, and measures to facilitate adoption of interventions at scale. Flagship 4 on Social Protection for Agriculture and Resilience addresses mechanisms for social protection and risk management for the poor. Flagship 5 on Governance of Natural Resources analyses tenure security and institutional arrangements for governance of shared landscapes. Flagship 6 on Cross-cutting Gender Research and Coordination examines gender equity and agricultural performance, and hosts the CGIAR Collaborative Platform for Gender Research. These flagships are presented in greater detail in the flagship narrative sections of this proposal.

Researchers within the flagships support each other thematically, and often work together. For example, analysis of land tenure issues is important both for research on structural change and farm size dynamics in Flagship 2, and for institutional arrangements for management of shared landscapes in Flagship 5. The modeling tools developed under Flagship 1 provide an insightful assessment of the costs and benefits of reduction in postharvest losses studied in Flagship 3. In many cases, the flagships also link closely to partners (both CRPs and external). For example, the gender work in Flagship 6 achieves impact through linkages with other CRPs and broadly within the development community.

Of the three overarching objectives (System-Level Outcomes, or SLOs) of CGIAR – poverty reduction, nutrition and health, and natural resource management, PIM contributes most to the first and third.

PIM's contribution to **poverty reduction** includes work on agricultural growth, its contributions to rural transformation, and the role and performance of social protection and insurance. PIM's research affects poverty through four primary channels:

- ***The direct income effect of agricultural growth (a significant focus of PIM, primarily in Flagships 1, 3, and 4):*** Adoption of new technologies and management practices and better arrangements for marketing and input supply increase incomes of producers and actors along the value chain. Impacts vary by gender and income group. Consumers benefit if food prices decline in response to increased supply. Creating sustained and poverty-reducing income effects despite climate change requires proactive adjustment to new weather and climate information, selection of promising technologies, and instruments to manage risks.
- ***Diversification of rural economies and related job creation – the rural employment effect (a significant focus of PIM, primarily in Flagships 2, 3, and 6):*** When technical advances reduce labor demands on the farm and simultaneously generate employment opportunities off the farm (such as, for example, substitution of mechanical power for animal draft power), the impact of job creation off the farm can be very substantial. Whether women of all ages, young men, and members of marginalized groups have opportunities to take the newly created jobs largely determines how inclusive the growth process is.
- ***Diversification of livelihoods toward those more intensive in financial and human capital rather than natural capital (a significant focus of PIM, primarily in Flagships 1, 3, 4, and 6):*** Very poor societies, and within them women and members of marginalized groups, tend to be overly dependent on livelihood strategies based on natural capital. Agricultural growth that raises incomes creates potential for more diversified livelihoods. The ability of women of all ages and young men to control financial assets and invest in human capital affects the pace and distributional impact of diversification of livelihoods.
- ***Economywide price effects and structural change – the generalized employment effect (a significant focus of PIM, primarily in Flagships 2 and 6):*** When agricultural growth reduces food prices, labor costs fall and jobs are created in the manufacturing and service sectors. Whether these new jobs require physical migration and whether they are open to women affects the extent to which women can contribute to and benefit from structural change.

PIM's work affects **health and nutrition** through its influence on poverty (as described above) and through:

- ***Dietary shifts occasioned by changes in relative prices, costs of marketing, and consumer demand (addressed by PIM through foresight modeling in Flagship 1 and social protection in Flagship 4):*** Changes in prices in response to subsidies or shifts in production costs induce substitutions within the diet toward items that become relatively cheaper. Higher incomes also lead consumers to diversify diets.

- **Reduction in loss and waste along the value chain (a significant focus of PIM, addressed primarily in Flagship 3):** Reduced loss increases the affordability of food for the poor. Many of the most perishable foods are dense in proteins and vitamins, and particularly important for the diets of children.

PIM's work addresses the quality of the **natural resource base** through:

- **Rights to natural resources and their governance (a significant focus of PIM addressed primarily in Flagships 2, 5, and 6):** Secure tenure is associated with higher rates of investment in assets and reduced incentives for asset degradation. Institutional arrangements to manage resources and reduce conflict contribute to all three SLOs and particularly to the third, with important consequences for women and marginalized groups.
- **New technologies and management practices that increase or reduce demands on natural resources (a modest focus of PIM, through modeling of the impact of technical change on resources and attention to ecosystem services, addressed through Flagships 1 and 5):** Technical change can be either resource-improving or resource-depleting. The PIM portfolio includes modeling of tradeoffs in sustainable intensification, and examination of institutional arrangements to manage them.
- **Changing consumer demand for food, which can lead to shifting pressures on resources (addressed by PIM through foresight modeling in Flagship 1, analysis of rural-urban linkages in Flagship 2, and studies of value chains in Flagship 3):** Urbanization and increased incomes lead to increased demand for meat – which has a large land and water footprint – and for fruits and vegetables – which often require more developed institutional arrangements around water management.

### Geographic targeting of the program

Of the slightly over 1 billion people living on less than \$1.25 (international poverty line, revised in November 2015 to \$1.90) per day, about 40% are in each of South Asia and Africa south of the Sahara, and about 15% in East Asia. (In other regions, poverty remains an issue but national poverty lines are considerably above the international threshold.) Manifestations of poverty and potential solutions vary across geographies. For example, in much of East Asia, land and labor markets must react quickly to a rapidly aging and declining farming population. In Africa south of the Sahara, in contrast, more than 11 million young people enter the labor force each year, predominantly in rural areas, and most will work in agriculture, either on or off the farm. Many of Asia's poor (in both South Asia and East Asia) are not far from the international poverty line; in these regions the poverty headcount is high, but the poverty gap (that is, the distance from current average income to the poverty line) is small. An estimated \$9 per year would be sufficient to move the average poor rural resident in East Asia above the international poverty line, and an estimated \$23 in South Asia.<sup>3</sup> The poor in Africa south of the Sahara are slightly more numerous, and much poorer on average, than their Asian counterparts; in that region \$85 per year would be required to move the average poor rural resident over the poverty line.

Dorosh and Thurlow have shown that in Africa south of the Sahara agricultural growth is particularly important for the ultra poor, i.e. people living on \$0.75 per day or less. For those at or close to the poverty line, growth in agriculture and in the service sector are of approximately equal importance for improved incomes (Dorosh and Thurlow 2015). Thus, **Africa south of the Sahara** presents a very great challenge for poverty reduction, and is a region of concentration for PIM. Additional areas of concentration include **Bangladesh, India, and selected countries in MENA and East Asia and the Pacific.**

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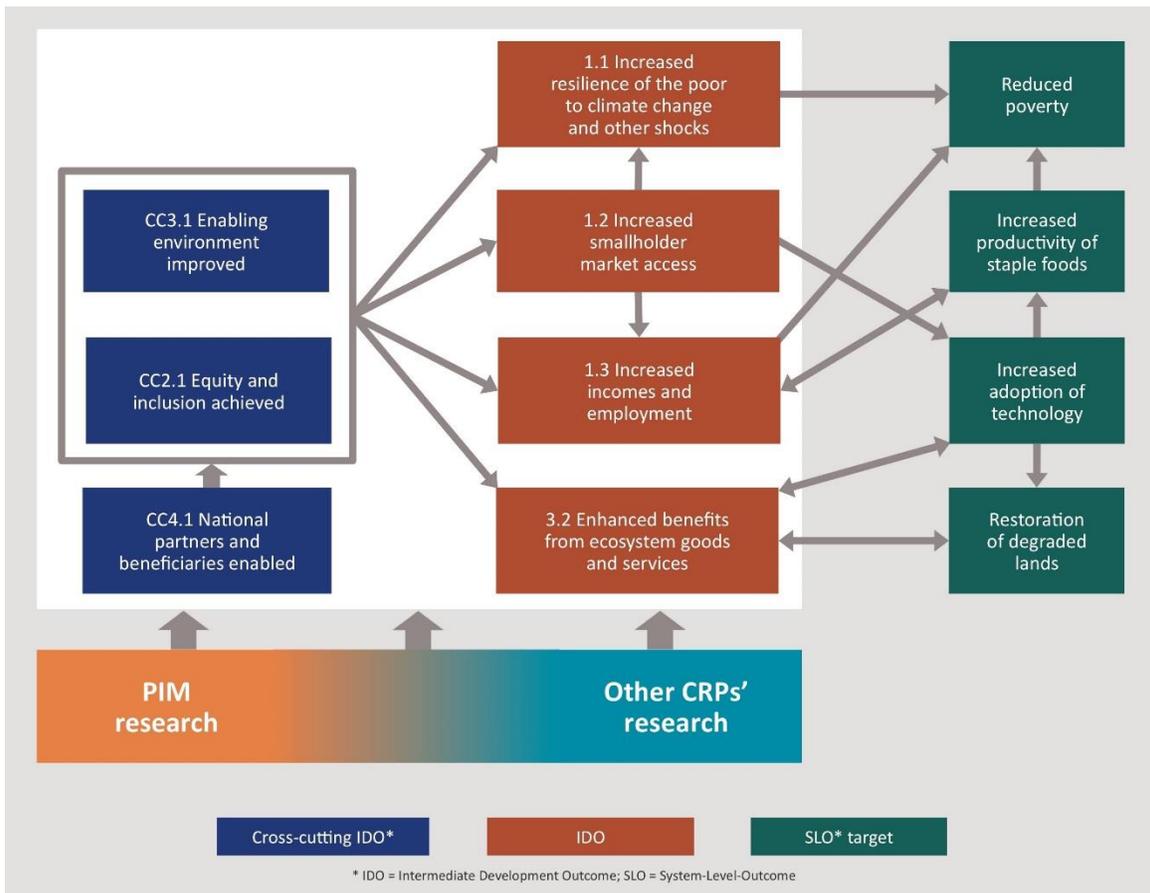
<sup>3</sup> Alejandro Nin-Pratt, correspondence, 2016.

PIM’s portfolio strives to achieve balance between creating **global public goods** in the policy domain (such as agreements and conventions to address price volatility) and addressing **policy measures relevant to national and regional challenges**. Each of the flagships includes work of cross-country, regional, or global relevance, and work applicable to specific circumstances and choices in countries of engagement.

### 1.0.2 Goals, objectives, targets

**PIM leads results-oriented research to equip decision makers with the evidence needed to support food and agricultural policies that serve the interests of poor producers and consumers, both men and women.** PIM contributes to all targets defined for the three System-Level Outcomes, with strong focus on the following four: **increased adoption of technology, increased productivity<sup>4</sup> of staple foods, reduced poverty, and restoration of degraded land**. Figure 1.0.2.1<sup>5</sup> shows how the contributions described in Section 1.0.1 are reflected within the SRF framework. **A note describing the methodology used to estimate PIM’s contribution to the SLO targets is appended to this proposal (Annex 3.11.7).**

**Figure 1.0.2.1: PIM’s contribution to four SLO targets**



<sup>4</sup> Throughout this proposal the term productivity is used in a broad sense, including yield, total factor productivity, and the variability and sustainability of production.

<sup>5</sup> The numbers in Figure 1.0.2.1 reflect the numbering system of SLOs, IDOs, and Sub-IDOs used by participants in the Cross CRP Monitoring, Evaluation and Learning workshop held in Paris on June 30-July 2, 2015.

PIM's contributions to the intermediate outcomes related to **enabling environment and capacity development** have effects on all higher-level targets. Figure 1.0.2.1 shows important relationships, including those among the targets themselves (for example, the productivity target is influenced by the technology adoption target), and among the main intermediate outcomes to which PIM contributes.

Figures 1.0.2.2a and 1.0.2.2b (at the end of this section) display a view of the main intermediate outcomes to which PIM's work contributes. Table 1.0.2.1 repeats this information in tabular form.

PIM's flagships interact with each other, and hence program-level outcomes are not attributable solely to particular ones. The **specific outcomes of the program, with the research questions that inform them**, are summarized below:

## Outcomes

***Improved prioritization of agricultural research for development:*** Which lines of research are likely to have high pay-offs over the decades ahead, taking into account climate change? In which geographies will the research be most relevant? Which lines of research would have the greatest benefits for women, smallholders, and members of marginalized groups?

***Increased and more effective investment in agricultural research:*** How much are developing countries investing in agricultural research and technology, and how does this compare to benchmark levels of investment needed to attain global and national goals? Are developing countries investing in the most promising lines of research? Is the institutional arrangement for work with regional partners and private firms conducive to good results? Are young women joining the ranks of agricultural researchers?

***Increased and more rapid adoption of improved technologies and management practices, including in response to climate change:*** What policies and regulations encourage or inhibit speedy release and rapid adoption? What delivery mechanisms work in different contexts to promote the demand for and supply of technology to different types of smallholders? What features distinguish technologies and management practices adopted by women?

***A conducive environment for inclusive and sustainable growth:*** Do policies and regulations promote investment in agriculture and create opportunities for growth? Do they encourage efficient and inclusive value chains and promote secure tenure over natural resources? What types of public spending are most productive in meeting targets for growth, sustainability, and inclusion? How do particular lines of spending benefit smallholders, young people, and women differentially?

***Reduction in price- and trade-related distortions that penalize producers and raise prices for consumers:*** Marketing boards, missing infrastructure, border restrictions, and other distortions to efficient transactions reduce welfare of poor consumers and producers, particularly smallholders. Where along the value chains do these excess costs enter, and through what mechanisms? Are particular distortions more damaging to economic prospects of women and smallholders than others?

***Better functioning value chains, with increased opportunities for participation:*** Are particular nodes of the value chain more conducive to job creation for women and young people? At which nodes along value chains do inefficiencies enter, and how? Who bears the cost of these inefficiencies? Which of these are most damaging to overall welfare? What interventions can be effectively adopted at scale, including by

the private sector, to reduce the most important welfare losses in value chains? Where do waste and loss enter into the value chain, and what is the magnitude of loss?

**Improved design and coverage of social protection programs to enhance resilience:** How can social protection programs best spur agricultural growth? How can the design, delivery, and targeting of social protection programs be improved to increase complementarities with agricultural and nutritional interventions? How can insurance coverage for smallholders be increased? Do women and men have different needs for insurance and risk management?

**Increased security of rights to natural resources, particularly by women and members of marginalized groups:** Where does insecure tenure constrain productive and sustainable management of natural resources? What are advantages of different forms of tenure for women, members of marginalized groups, and for the community? Where community groups and individuals have overlapping claims for use of resources, how can shared governance be implemented?

**Better tools and methods for research on policy, institutions, markets, and gender dimensions of each, and coordinated work on these topics across the CGIAR portfolio and among partners:** Which tools and methods are of highest priority to develop for CGIAR and other research partners? How can tools and methods be designed to address relevant gender dimensions? How can improved methods for collection and analysis of age- and sex-disaggregated data lead to more informed diagnosis and equity-enhancing strategies? How can approaches to gender research help us better understand the youth agenda?

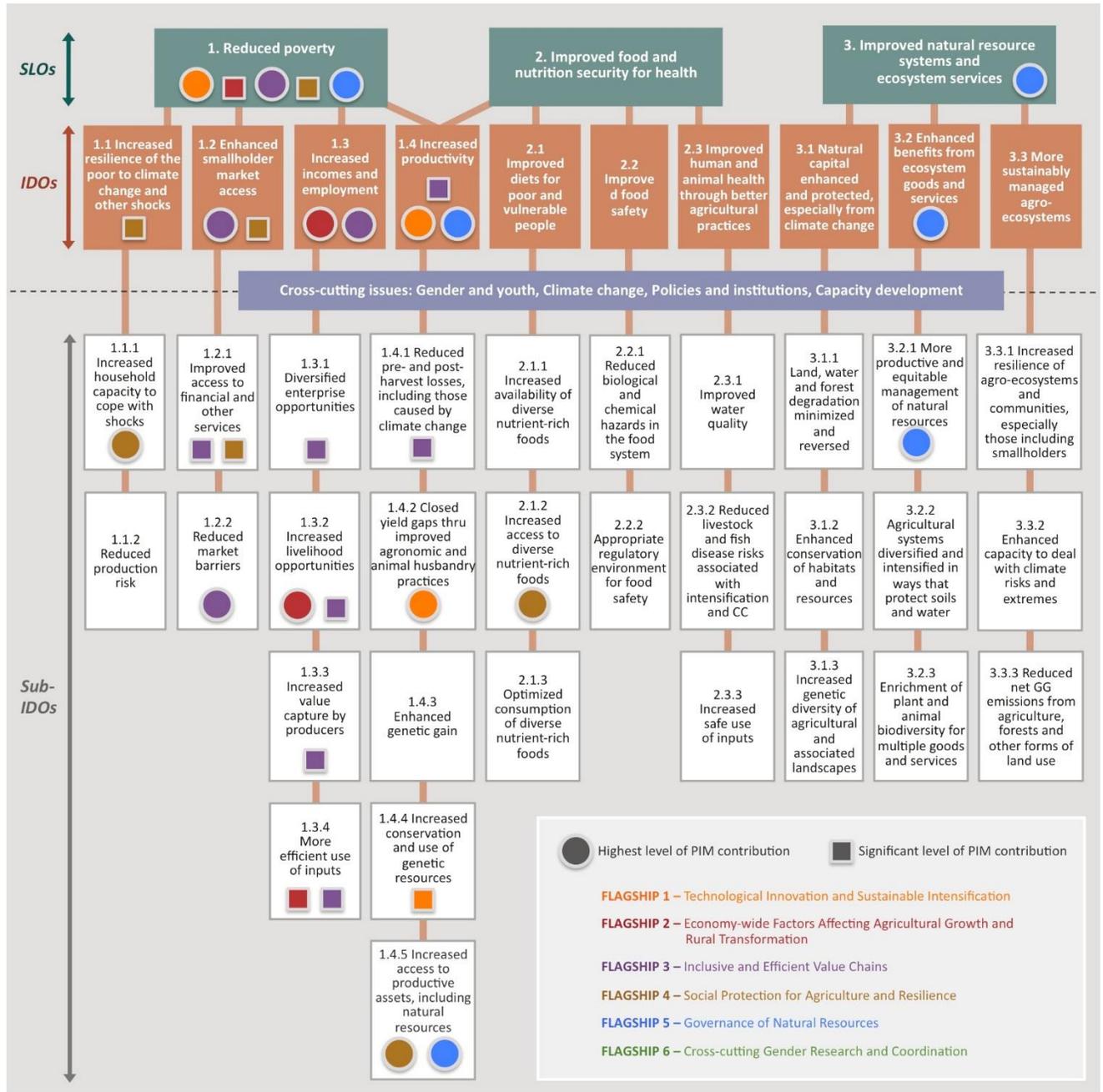
## Value for money

PIM's value proposition is expressed in terms of **contribution to the quantitative targets associated with the System-Level Outcomes, and rate of return analysis applied to selected elements of the program.** PIM researchers acknowledge that impact is achieved through partnerships and complementary contributions of many players. For selected discrete policy changes (such as, for example, removal of an export ban), benefits of the change can be calculated, as can the cost of research contributing to the change. A share of benefits required to yield a benchmark rate of return to investment can be calculated, and that share will usually be very small. In other cases, excellent policy-oriented research may yield no discernible change on the ground due to considerations of political economy. Over the entire research portfolio, the share of impact attributable to PIM's work should yield **a rate of return to investment of at least 12% (approximately), which is the benchmark rate used by the development programs** with which CGIAR collaborates. This rate is broadly consistent with modified internal rates of return (MIRR) to agricultural research found in empirical work by Hurley et al. (2014). It should be noted, however, that many development projects intended for technical assistance or capacity strengthening are not held to the benchmark rate of return.

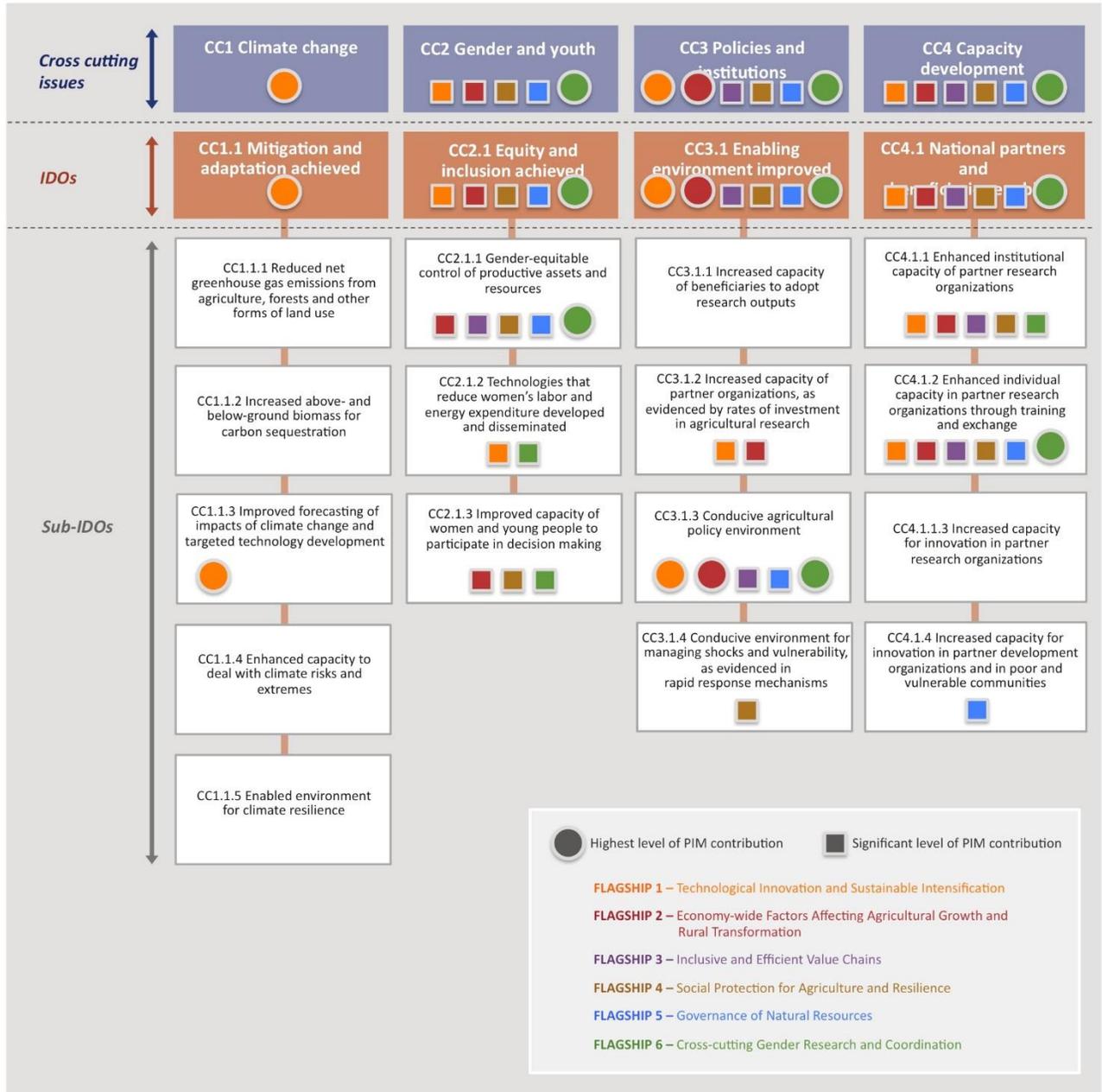
**Table 1.0.2.1: PIM's contribution to the CGIAR results framework**

SLOs	IDs	Sub-IDs
1 Reduced poverty	1.1 Increased resilience of the poor to climate change and other shocks	1.1.1 Increased household capacity to cope with shocks
	1.2 Enhanced smallholder market access	1.2.1 Improved access to financial and other services
		1.2.2 Reduced market barriers
	1.3 Increased incomes and employment	1.3.2 Increased livelihood opportunities
		1.3.3 Increased value capture by producers
		1.3.4 More efficient use of inputs
	1.4 Increased productivity	1.4.1 Reduced pre and postharvest losses, including those caused by climate change
		1.4.2 Closed yield gaps through improved agronomic and animal husbandry practices
		1.4.4 Increased conservation and use of genetic resources
		1.4.5 Increased access to productive assets including natural resources
2 Improved food and nutritional security for health	2.1 Improved diets for poor and vulnerable people	2.1.2 Increased access to diverse nutrient-rich food
3 Improved natural resource systems and ecosystem services	3.2 Enhanced benefits from ecosystem goods and services	3.2.1 More productive and equitable management of natural resources
Cross-cutting issue 1 Climate Change	CC1.1 Mitigation and adaptation achieved	CC1.1.3 Improved forecasting of impacts of climate change and targeted technology development
Cross-cutting issue 2 Gender and youth	CC2.1 Equity and inclusion achieved	CC2.1.1 Gender-equitable control of productive assets and resources
		CC2.1.2 Technologies that reduce women's labor and energy expenditure developed and disseminated
		CC2.1.3 Improved capacity of women and young people to participate in decision making
Cross-cutting issue 3 Policies and institutions	CC3.1 Enabling environment improved	CC3.1.2 Increased capacity of partner organizations, as evidenced by rates of investment in agricultural research
		CC3.1.3 Conducive agricultural policy environment
		CC3.1.4 Conducive environment for managing shocks and vulnerability, as evidenced in rapid response mechanisms
Cross-cutting issue 4 Capacity development	CC4.1 National partners and beneficiaries enabled	CC4.1.1 Enhanced institutional capacity of partner research organizations
		CC4.1.2 Enhanced individual capacity in partner research organizations through training and exchange
		CC4.1.4 Increased capacity for innovation in partner development organizations and in poor and vulnerable communities

**Figure 1.0.2.2a: Contribution of PIM's flagships to the CGIAR Results Framework, with intensity of contribution (SLOs)**



**Figure 1.0.2.2b: Contribution of PIM's flagships to the CGIAR Results Framework, with intensity of contribution (cross-cutting areas)**



### 1.0.3 Impact pathway and theory of change

Constraints to the enabling environment often take the form of restrictive regulations, laws, and decrees; sub-optimal allocation of public resources and rules regarding access to them; behavioral norms and institutional arrangements that restrict opportunities and voice of actors; and market failures or missing markets. PIM's research contributes to reduction or removal of these constraints by empowering actors in the policy process to achieve change. PIM's work draws on the current understanding of the policy process within disciplines of political science, sociology, and economics (see, for example Stachowiak 2013 and Resnick et. al. 2015), and contributes to it through Cluster 2.3.

Effective policy-oriented research is undertaken jointly with partners and stakeholders, and with input from beneficiaries. It is often inter-disciplinary, and builds capacity of local partners to continue engagement on the issues. Research teams must provide timely contributions, be responsive to demand from end-users, and sufficiently flexible to adapt to contextual changes. Researchers supported by PIM are expected to apply these principles to their work. In addition, prior to initiating a new line of research, they are asked to **confirm the importance of the proposed topic in relation to a specific constraint, identify key actors and a mechanism of change, clarify the timing and context in which change is likely to occur, assess whether evidentiary input is welcome, link with local research partners, and make a plan to convey results to the primary actors and interested parties (Figure 1.0.3.1)**. PIM's theory of change assumes that, if these steps are undertaken and revisited regularly, research is likely to influence policy outcomes. Impact is never assured, however, and pathways for policy-oriented research are not fully predictable. Assessing progress along the way and impact *ex post* allows harvest of lessons learned, both about the policy process and the design of the research. When outcomes are not as desired, feedback loops can reopen options in the future. Thus the impact pathways for policy change are more akin to continuous feedback loops than to linear pathways.

**The research topics selected within the six flagships of PIM are framed around constraints judged to be most damaging for attainment of the objectives of the SRF.** Examples of such constraints are underinvestment in or misallocation of funds for agricultural research; underinvestment in complementary rural public goods and services; imposition of regulatory barriers to technological dynamism and adoption of new technologies; impediments to participation in value chains on the part of smallholders, women, young people, and members of marginalized groups; exposure to risk and shocks; weak property rights; and restrictive gender norms and practices.

Specific impact pathways for given constraints vary according to the relative importance of individual champions and interest groups, national issues versus external shocks or global developments, the roles of ideology and evidence in affecting outcomes, the latitude afforded by national constitutions versus the need to abide by international commitments, and many other factors. In some settings, PIM researchers directly engage with actors in the process for the duration of a policy cycle (e.g. biosafety regulations, WTO negotiations, social protection). In others, PIM's work is intended to inform interventions of partners and other parties, including other CRPs and boundary partners, with modest direct engagement. For example, PIM works with CRP Roots, Tubers, and Bananas to enhance the participation of women in value chains for native potatoes in Andean countries.

Figure 1.0.3.1: PIM’s theory of change

Core constraints	Channels of influence	Engagement with the policy process	Program-level outcomes	Major contribution to SLO targets
<ul style="list-style-type: none"> <li>Regulations, laws, and decrees that restrict adoption of technologies</li> <li>Suboptimal allocation of public resources and rules regarding access to these resources</li> <li>Market failures or missing markets</li> <li>Uncovered exposure of smallholders to risks and shocks</li> <li>Weak property rights</li> <li>Restrictive gender norms and practices</li> </ul>	<ul style="list-style-type: none"> <li>Contribution to global agenda setting</li> <li>Debate on options for national policy, legislation, decrees, and budget formulation; contribution to regional agenda setting</li> <li>Design of local programs; innovations in markets and institutions</li> <li>Capacity development</li> </ul>	<div style="text-align: center;"> <p><b>Policy process</b></p> <p>Integrate feedback from partners and stakeholders</p> </div> <div style="background-color: #f8d7da; padding: 5px;"> <p><b>Risks (see Table 1.0.3.1):</b></p> <ul style="list-style-type: none"> <li>Low use of evidence by policy makers</li> <li>Perception of researchers’ bias</li> <li>Reluctance of policy makers to be seen as influenced by external researchers</li> <li>Changes in government and partners’ staff</li> <li>Diversion of funds</li> <li>Non-application of safeguards on research involving human subjects</li> <li>Excessively narrow window for policy influence</li> </ul> </div>	<ul style="list-style-type: none"> <li>Improved prioritization of agricultural research for development in global strategies and programs</li> <li>Increased investment in national agricultural research and development systems</li> <li>Increased adoption of superior agricultural technologies and practices</li> <li>Innovations that address technology delivery, market constraints, governance, social protection, and gender constraints are used by the private sector, development organizations, and governments</li> <li>A conducive policy and public expenditure environment for inclusive and sustainable agricultural growth</li> <li>Reduction in price, trade, and other policy distortions that penalize producers and harm consumers</li> <li>Strengthened capacity of policy, institution, and market researchers</li> </ul>	<ul style="list-style-type: none"> <li>Reduced poverty</li> <li>Increased productivity of staple foods</li> <li>Increased adoption of technology</li> <li>Restoration of degraded lands</li> </ul>

**PIM's research is designed to support outcomes at the global, regional/national, and local levels. These three different levels present different policy issues and processes, and thus require different mechanisms of engagement to achieve impact.** At the global level, research findings can influence global agendas, as, for example the Sustainable Development Goals (SDGs), World Economic Forum, WTO, G7 and G20 processes; international conventions on climate change, desertification, and deforestation; and the agendas of multilateral and regional organizations (for example, World Bank and The African Union). In these international fora, PIM represents issues common to the CGIAR portfolio, sometimes in conjunction with other CRPs. Work at the regional/national level addresses policy reforms under consideration and strategies for sectoral development, often at the request of governments or national counterparts. The long-standing working relations with national counterparts through IFPRI's Country Strategy Support Programs in Bangladesh, Egypt, Ethiopia, Ghana, Malawi, and Nigeria provide a foundation for continued engagement in these countries. At a more local level, researchers assist in evaluating interventions and design of programs of importance to smallholder farmers and the rural poor, and involving national agencies, NGOs, CBOs, farmer organizations, and private firms. **A fourth channel of influence is through the building of policy analysis skills** within and outside CGIAR in order to expand the evidence base for a larger number of policy processes. **PIM draws on each of these channels of influence, often in combination, to contribute to specific policy outcomes.** For example, Figure 1.0.3.3 shows how PIM will use all four channels of influence in an integrated approach to contribute to reduction of postharvest loss and food waste (sub-IDO of SRF and SDG Target 12.3).

PIM's role as an integrating CRP working in conjunction with other programs facilitates achievement of impact greater than could be achieved by the program alone. **PIM assists the CRPs working in a given setting (e.g. major CGIAR countries of collaboration) to diagnose constraints to the enabling environment, prioritize those that matter most to specific CRPs and constituencies, and develop common approaches to addressing them.** PIM's collaboration with other CRPs is implemented through shared contributions in countries of collaboration, colocation of research and co-investment with other CRPs (as highlighted in Annex 3.7), oversight of communities of practice, and management of the collaborative platform on gender (see Figures 1.0.3.2 and 1.0.3.3).

More examples of specific outcomes and theories of change behind them are presented in the flagship narratives.

**Figure 1.0.3.2: How PIM's flagships and other CRPs collaborate for adoption of technology**

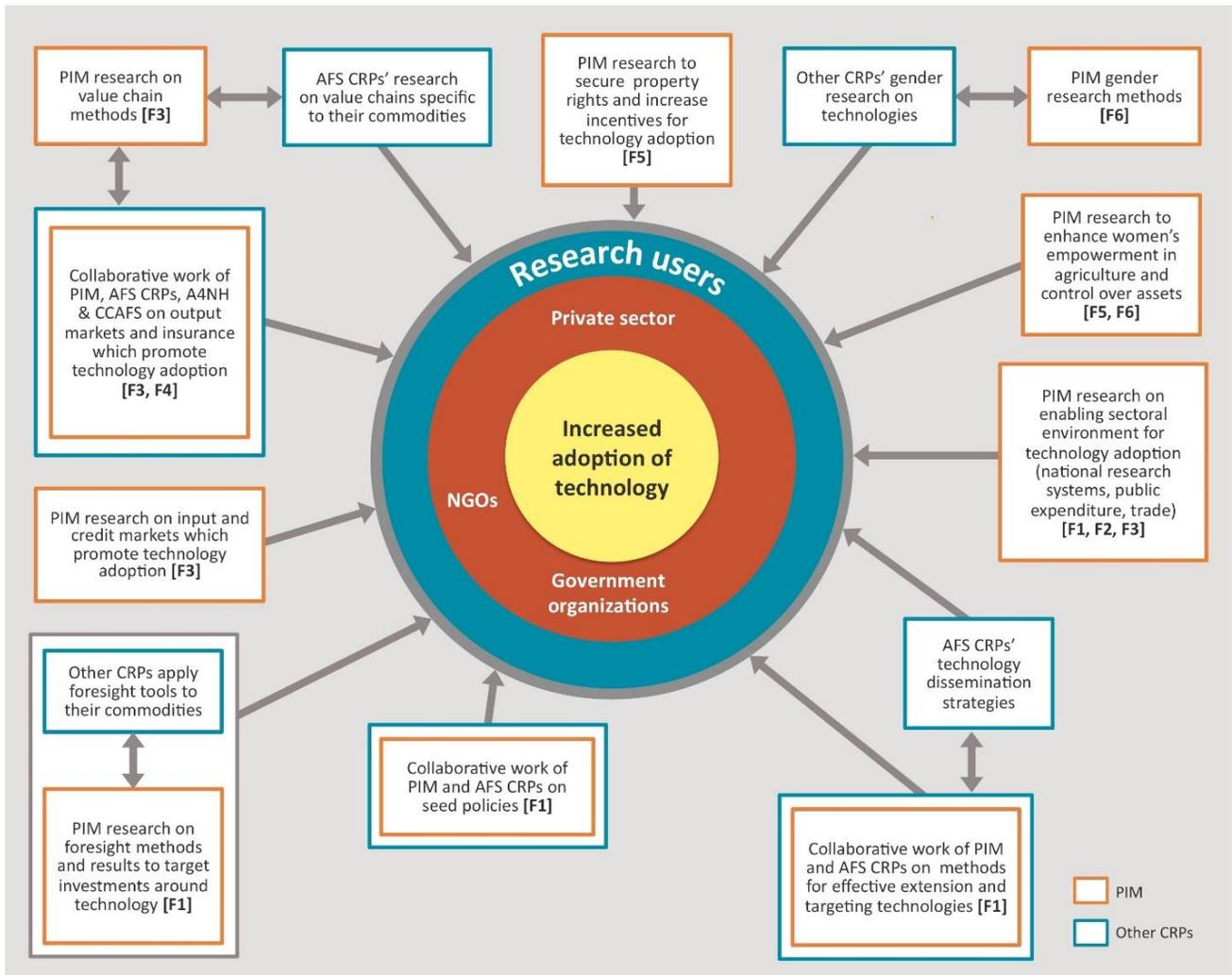
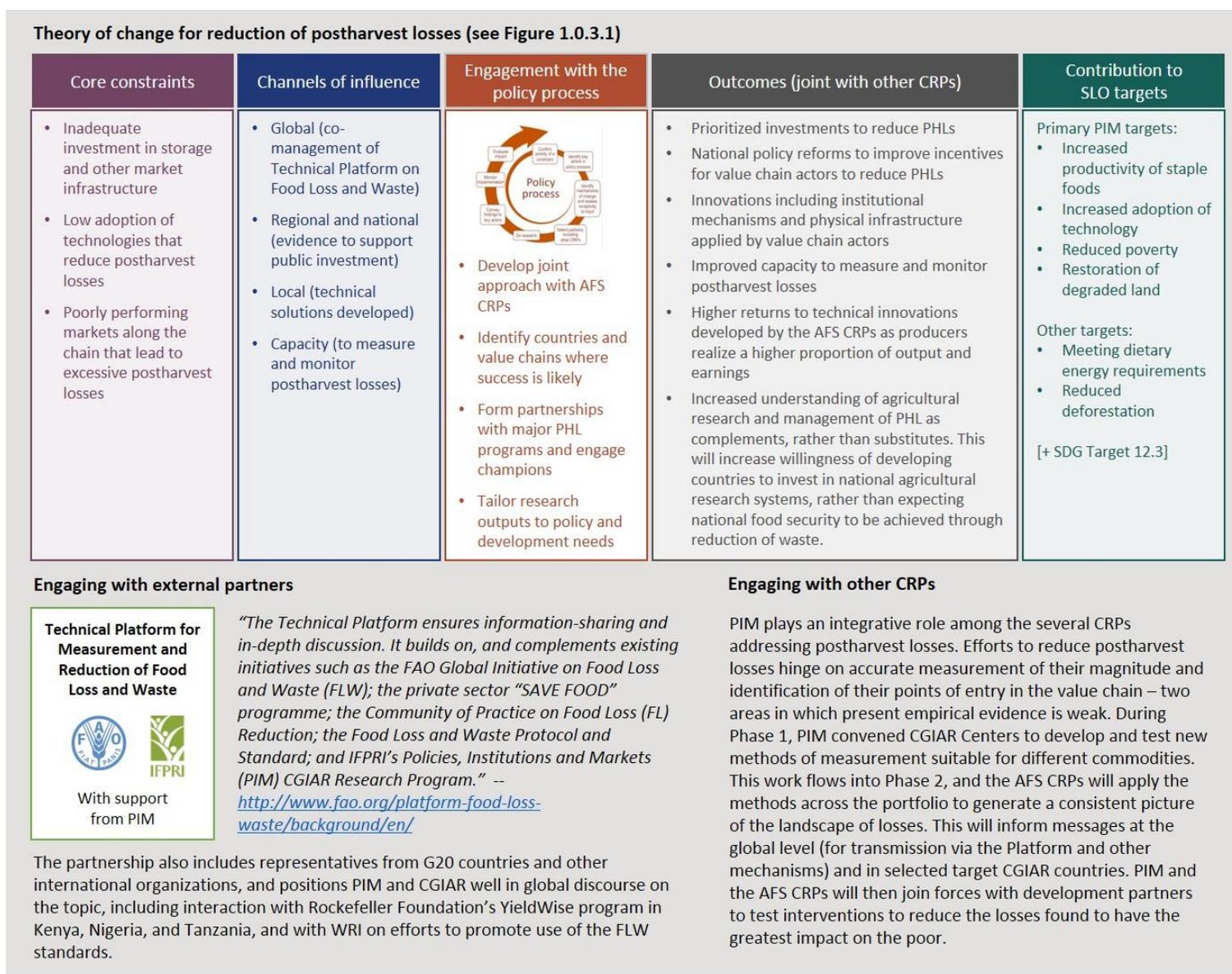


Figure 1.0.3.3: PIM’s theory of change in action: reduction of postharvest losses



The PIM program accords specific attention to gender, youth, capacity development, and climate change in recognition of the importance of these topics to the SRF and SDGs.

PIM's **gender** research has been highly useful to major development partners. Work on gendered patterns of landholding, and particularly the findings on joint ownership by men and women, have influenced the way FAO and other organizations collect data on landholding. The application and continued refinement of the Women's Empowerment in Agriculture Index (WEAI) is welcomed by development agencies, notably USAID's Feed the Future program, as a much needed common metric that allows inclusion of consistent coverage of gender issues in program monitoring. Regular training sessions on use of the WEAI and on methods for collection and analysis of sex-disaggregated data build capacity and collegiality within the community of researchers working on gender and agriculture. The new [Journal of Gender, Agriculture and Food Security](#) supported by PIM provides researchers with a dedicated outlet for publication of peer-reviewed work.

PIM's work on **youth** focuses on employment in agriculture, with emphasis on Africa south of the Sahara. Research is designed to clarify systemic barriers to opportunities for young people, such as limited access to land, skills, and finance. This work is embedded in the analysis of structural transformation, and achieves impact by shifting the agenda from emphasis on small-scale youth employment projects to an understanding of how policy reform can create jobs on a larger scale. PIM has recently established a partnership with FAO's Youth Employment Program. PIM's research on property rights has a particular focus on the needs of youth and women.

PIM's investment in the **capacity** of CGIAR partners, both individual and institutional, is part of the effort to achieve the conditions required for impact described above. Over 10,000 people annually benefit from individual training, and many more access training materials on line. The AGRODEP training in modeling and impact evaluation for African researchers (described in the Flagship 3 narrative) is an example of individual training with impact beyond the participants, as parallel efforts are undertaken to use the acquired skills in national policy analysis through the development of the country SAKSS nodes. PIM also builds capacity at the institutional level, for example through improving monitoring and evaluation efforts of subregional research organizations, providing guidance on collection and use of sex-disaggregated data by CRPs, FAO and other partners, and advising on measurement of policy distortions by international organizations.

PIM's work on **climate change** achieves impact through influencing global agendas (with the foresight modeling work) and through assisting countries to understand the implications of climate change for them. PIM's research on natural resource governance contributes to improved landscape management and adoption of long term investments which help communities adapt to climate change. Work on insurance and social protection also contributes to impact in addressing climate change by assisting the rural poor and smallholders to respond to weather shocks.

In each of the areas above, PIM's impact depends on the recognized high quality and objectivity of the work. For that reason, quality assurance is key. In light of the finding of the PIM evaluation that the quality of the work assessed was variable, quality assurance will be accorded more importance during Phase 2, with principles of **results-based management** applied to direct resources toward teams and lines of work that are delivering the best quality outputs (see Annex 3.6).

## Outcome-related risks and planned mitigation

The main risk to PIM's portfolio derives from the dependence of impact on the policy process, and the high degree of uncertainty associated with outcomes. A list of major risks, with level of risk, impact of adverse outcome, and mitigating actions, is shown in Table 1.0.3.1.

**Table 1.0.3.1: Risk matrix for outcome-related risks**

Risks	Risk level	Risk Impact	Mitigating actions
Policy makers have objectives that counter recommendations drawn from evidence	High	High	<ul style="list-style-type: none"> <li>Establish long term relationships with key players</li> <li>Establish agreed upon agenda that is demand-led</li> <li>Work through carefully chosen nongovernmental partners to build support for beneficial outcomes</li> <li>Use knowledge of the policy process</li> </ul>
Researchers are seen as parties to the political process and hence not objective	Medium	High	<ul style="list-style-type: none"> <li>Refrain from engaging directly in political debates</li> <li>Be transparent in partnerships including funding sources, and avoid partnerships that can be construed as harmful to objectivity</li> </ul>
Policy makers do not want to be seen as influenced by external researchers	Medium	Medium	<ul style="list-style-type: none"> <li>Work with and through national partners</li> <li>Develop communication strategies with policy makers at the launch of the research</li> </ul>
Personnel in government and partners changes, so that the relationships built disappear	Medium	Medium	<ul style="list-style-type: none"> <li>Avoid excessive reliance on single champions</li> </ul>
Funds for pilot interventions are diverted through graft or corruption	Low	Medium	<ul style="list-style-type: none"> <li>Keep pilots small</li> <li>Oversee testing of interventions closely</li> <li>Partner with reputable implementation organizations that have procedures in place to manage fiduciary risk</li> </ul>
Research involving human subjects is undertaken without appropriate safeguards	Medium	High	<ul style="list-style-type: none"> <li>Require clearance by Lead Center's Institutional Review Board, and require all Participating Centers to have such procedures</li> </ul>
Narrow windows of opportunity to contribute to policy processes are missed	Medium	Medium	<ul style="list-style-type: none"> <li>Invest in maintenance of quality tools and data that can be used to respond quickly to requests</li> <li>Maintain active communications with partners close to policy processes</li> <li>Invest in empirical studies that have relevance beyond the countries in which they take place</li> </ul>

## 1.0.4 Gender

### Overview of PIM's gender research and coordination

The gender research within PIM addresses **the policy and institutional foundations for barriers to equity between women and men, and how to reduce or remove them**. More generally, the work on gender in PIM seeks to understand the specific ways in which gender roles and relations condition success in reducing poverty, improving health and nutrition, and improving management of natural resources, and this general objective reflects PIM's role as host of the CGIAR Collaborative Platform for Gender Research.

Gender in PIM is featured both through **a dedicated flagship – Flagship 6, Cross-cutting Gender Research and Coordination**, consisting of two clusters – and through **gender work conducted in other flagships**. The present section contains a summary of this work; more detail can be found in the specific flagship narratives.

Flagship 6 has the following objectives:

#### Cluster 6.1 – Gender, Agricultural Productivity, and Rural Transformation:

- Establish priorities for gender research within PIM (in collaboration with the Gender Platform).
- Develop methods and identify best practices for collecting and analyzing sex-disaggregated data for policy analyses.
- Integrate gender issues across the PIM flagships: for example, synthesize results on barriers to women in access to and ability to benefit from technologies (Flagship 1), value chains (Flagship 3), and natural resources (Flagship 5), understand how structural transformation and public expenditure decisions affect opportunities for women, both young and old (Flagship 2), examine the role of social protection in addressing gender dimensions of vulnerability (Flagship 4).
- Undertake selected studies on topics not addressed within the flagships.

#### Cluster 6.2 – CGIAR Collaborative Platform for Gender Research:

- Assess priorities for gender research across CGIAR, identify the extent to which such priorities are being addressed, and identify gaps.
- Support knowledge-sharing to promote joint approaches and methods for integration of gender into technical research areas such as crop and livestock improvement and climate science, and scaling out gender-responsive or transformative innovations.
- Foster adherence to minimum standards for sex-disaggregated data collection, including access to and exchange of expertise and materials across programs.
- Establish common approaches to gender-responsive M&E and measurement of gender dimensions of development outcomes.
- Foster and catalyze strategic partnerships on gender and capacity strengthening within CGIAR and with local development partners to enhance the impact of agricultural research for development.
- Increase the visibility of gender research within CGIAR, and raise appreciation for how understanding of gender increases the impact of agricultural research for development.

## Impact Pathway and theory of change

Gender research in PIM contributes to two cross-cutting intermediate objectives (IDOs) of the CGIAR SRF: “Equity and inclusion achieved” (CC2.1) and “National partners and beneficiaries enabled” (CC4.1). These have knock-on effects on many other intermediate objectives (IDOs), primarily those under SLO1 on poverty reduction. The equity intermediate objective (IDO) is the direct target for the empirical research on gender roles in agriculture, development of monitoring tools, and testing of equity-enhancing innovations – such as those that strengthen value chains, or social protection programs that target vulnerable women. The capacity intermediate objective (IDO) is the direct target for the work on gender research methods.

Empirical evidence from PIM’s gender research throughout the program translates into development outcomes through building on strong partnerships with potential users of the information, including major funding agencies, international organizations, and NGOs. PIM convenes dialogues with these groups to assess knowledge gaps, works hand in hand with implementing partners in project contexts, and responds to many requests for support in gender analysis. PIM also actively disseminates information through high-quality publications and briefs, and other media such as the [EnGendering Data blog](#). The capacity strengthening pathway is based on the excellent track record of PIM in both methods development and training of researchers, as evidenced by methods and guidelines produced, training sessions organized, and a strong role in gender research networking within CGIAR. Dissemination of the PIM gender research methods will be enhanced in Phase 2 by positioning the Gender Platform as part of PIM.

The Gender Platform will create higher visibility for the gender work, which should lead to greater funding for this type of research, including more participatory testing of options that lead to women’s empowerment. Good communication of results will assist development partners and CGIAR researchers to identify opportunities to apply research results in development interventions. Specific mechanisms for enhancing impact through the Gender Platform include:

- Coordinated research efforts on gender in CGIAR countries of collaboration.
- Production of visible gender products and events in collaboration with local partners.
- Co-development of tools, outcome pathways, and strategies to achieve outcomes.
- Innovative communication and capacity strengthening strategies.

## Gender outcomes

**PIM gender outcomes for Phase 2 (achieved through Flagship 6 and the gender research in the other flagships)** are the following:

- Agriculture and gender-focused strategies and policies are informed by improved evidence on the role of gender in agriculture and rural development.
- Agriculture and gender-focused programs use tested interventions that promote inclusion of men and women and empower disadvantaged groups, leading to reduced gender inequalities.
- The capacity of researchers within CGIAR and in partner organizations in gender research is improved.
- Monitoring and evaluation systems of research and development organizations use sex-disaggregated data to measure selected core indicators.

The CGIAR Collaborative Platform for Gender Research aims to support the outcomes of all CRPs, through capacity building, knowledge sharing, and participatory prioritization of research topics to be addressed

by the other CRPs. The Platform will support all CRPs to meet their objectives by enriching and improving their attention to gender.

**Specific outcomes for the Gender Platform are:**

- Gender research within CGIAR is better prioritized, recognized, coordinated and shared;
- Gender researchers are linked through a strong community of practice.
- CRPs, Centers, and partner organizations are better able to draw on each other's methods, findings, and innovations to make research more gender-responsive and gender-transformative.
- Gender researchers deliver high-quality outputs, as measured in scientific publications as well as impact on the ground.
- Approaches for developing clear gender outcomes and impact pathways are improved and implemented; monitoring of gender outcomes across CRPs improves; the system is better able to deliver research that contributes to gender equity and inclusion.

**Gender outputs**

*Cluster 6.1 – Gender, Agricultural Productivity, and Rural Transformation*

Research under Cluster 6.1 will build on the knowledge base established in Phase 1 to identify and test interventions aimed at strengthening women's roles in agriculture. Specifically, the team will examine the **impacts of interventions designed to reinforce landownership, enhance participation in decision making, increase opportunities to engage in commercial agriculture, reduce production costs through the introduction of technologies conducive for women, and introduce insurance and savings products to better serve women's needs.**

Understanding how these interventions benefit women and the larger economy is crucial to gauge the scalability of interventions. Therefore **a new line of research will be introduced to understand how women's opportunities change in the structural transformation process**, and the implications for agriculture and poverty reduction. Randomized control trials, quasi-experimental approaches, and mixed methods will be used to answer the following research questions: What policies and institutions encourage women or support the capacity of women to innovate and change? How do different types of economic transformation influence gender roles in agriculture, productivity, and investment?

To enhance women's performance in agriculture, three conduits for change are examined: analysis of interventions that help women move from low-value to high-value activities; understanding production costs that fall differentially on women in specific technologies and management practices, in order to facilitate substitution that benefits women; joint work with Flagship 4 to explore insurance and savings products that appeal to women and enhance their resilience.

PIM will also continue the well-advanced efforts on **methods for collection and analysis of sex-disaggregated data**. The Women's Empowerment in Agriculture Index (WEAI) will be further refined (jointly with A4NH), and availability of WEAI midline and endline data will allow continued testing of the validity of the tool as well as yield substantive findings with regard to empowerment. New applications of the index will be explored, particularly in the realm of labor force participation, technology adoption, and agricultural productivity. Researchers will continue to examine men's and women's individual roles, but new emphasis will be placed on the extent to which they work together in different domains.

### *Cluster 6.2 – CGIAR Collaborative Platform for Gender Research*

The first key output of the Platform is **an assessment of ongoing gender research across CRPs** and of the tools, approaches, and strategies being employed. Special attention will be accorded to assuring that innovative gender work throughout CGIAR, and not just in PIM, is recognized and shared. Gender outcome and impact pathways across programs, particularly in CGIAR countries of collaboration, will be synthesized. This will be the basis for collaborative and coordinated work of the Platform. A second major output is to **develop research tools for conducting studies within these priority research areas**, when needed. A third output is **sharing these tools and conducting training on their use** to stimulate a body of high-quality research.

For a few selected studies, the Platform will oversee the implementation of the research. In more cases, it will convene sharing of findings, synthesize lessons learned, disseminate results to boundary partners, and help to raise awareness of gender research conducted by individual Centers and CRPs. Finally, the Platform will lead the development of methods for gender-focused project and program design, monitoring, learning, and evaluation within CGIAR.

#### *Other PIM flagships*

Gender and technology adoption will be a key topic within **Flagship 1**, in particular understanding women's demand for technology and extension methods that are effective in meeting women's needs, and assessing adoption of technology by women. **Flagship 2** will identify systemic barriers (for example in access to land) that constrain livelihood strategies for young men and young women, and examine how processes of migration and labor market dynamics affect gender roles in agriculture. This flagship also investigates the differential impacts of public expenditures on heterogeneous groups of men and women, the degree of inclusion of women in the design and advocacy of policies, and methods to lift barriers to their involvement. **Flagship 3** identifies interventions that increase gender equity in control of assets and in opportunities for employment along value chains. In addition, this flagship develops [tools](#) for gender analysis in value chains, which will be disseminated through the value chain hubs. **Flagship 4** studies how social protection programs assist women and men, change intrahousehold dynamics, and include gender in targeting and choice of instruments for delivery. Work under this flagship takes into account the preferences and constraints of both women and men when designing financial and insurance products, and later tests for uptake of the products by gender. **Flagship 5** explores pathways to strengthen the tenure security of particular groups, especially women, going beyond legislation in order to address customary authorities and gender norms that hinder improvements in women's rights to land, water, and other resources.

#### **Monitoring and Evaluation**

The M&E framework for PIM's gender research is described in Annex 3.4. The M&E framework for the Gender Platform will be developed as one of the key early activities of the Platform. It is anticipated that the Platform's outputs will lead to improving the methods used by all CRPs in monitoring their gender research. During Phase 2, PIM will commission an external evaluation of its gender research, including the performance of the Gender Platform.

## Operationalization and budget

Gender issues inform the design of work in each of the PIM flagships, as elaborated in the flagship narrative sections. In addition, Flagship 6 is dedicated wholly to gender research (including development of new tools and methods), and hosts the CGIAR Collaborative Platform for Gender Research. The hosting of the Platform is consistent with PIM's role as an integrative CRP. Along with all other CRPs, PIM will also be a contributing member of the Platform.

The Gender Platform will have a full-time Coordinator. **Both the Coordinator of the Gender Platform and the Leader of Flagship 6 will be members of the PIM Management Committee.** The Gender Platform Coordinator will be guided by a Steering Committee, composed of four selected (rotating) gender specialists from among the CRPs, and four non-CGIAR gender specialists from partner organizations. This group will review annual progress, identify key strategic issues for the year ahead, recommend areas for cross-cutting research, and report to the PIM Director on the performance of the Coordinator.

The **PIM gender budget for 2017** is estimated at **\$28M**, which represents **30% of the total PIM budget** (Table 1.0.4.1). The gender component of each flagship is derived by assigning a gender percentage to each of the Sub-IDOs that the flagship contributes to (see Table C of the Performance Indicators Matrix). For the Sub-IDOs under IDO CC2.1 on Equity and inclusion achieved, the gender percentage is assumed to be 100%. 100% of the Flagship 6 budget is counted as gender budget. See Section 1.1.4 (Table 1.1.4.1) in the CRP budget narrative for information about the gender component of the management and support costs.

**Table 1.0.4.1: PIM 2017 gender budget**

Component of gender budget	2017 gender budget, in \$M	% of total budget
Flagship 1	4.9	22
Flagship 2	5.8	28
Flagship 3	4.4	26
Flagship 4	3.3	36
Flagship 5	6.0	36
Flagship 6	3.6	100
Management and support costs	0.05	1.5
<b>TOTAL</b>	<b>28</b>	<b>30</b>

## 1.0.5 Youth

PIM's Youth Strategy (Annex 3.5) addresses the question: How can changes in the enabling environment create opportunities in agriculture for young men and women? The challenge is greatest in **Africa south of the Sahara**, and PIM's work focuses on that region.

PIM's comparative advantage is **to address the systemic policy and institutional barriers to entry of young people into agricultural employment, with emphasis on land, capital, and skills**. This approach complements that of AFS CRPs, NGOs, and development agencies, many of which are piloting interventions to create opportunities for selected individuals. PIM has ongoing discussions with organizations active on the topic of youth employment in Africa (for example, AfDB, AGRA, FAO, IFAD, the World Bank, Cornell University, Michigan State University, Sokoine University, and University of Pretoria).

As described in Annex 3.5, PIM's research contributes to understanding opportunities for entry of young people into four types of agricultural employment listed in Table 1.0.5.1.

**Table 1.0.5.1: Types of agricultural employment and their requirements**

Types of employment	Need for land	Need for capital	Need for skills
<b>Type 1 - Full-time on existing family holding</b>	None	Medium	Medium
<b>Type 2 - Full-time on new holding</b>	High	High	High
<b>Type 3 - Part-time combined with household enterprise; for example, sale of services</b>	Low	Medium	High
<b>Type 4 - Off-farm wage work along the value chain</b>	None	None	Medium or high

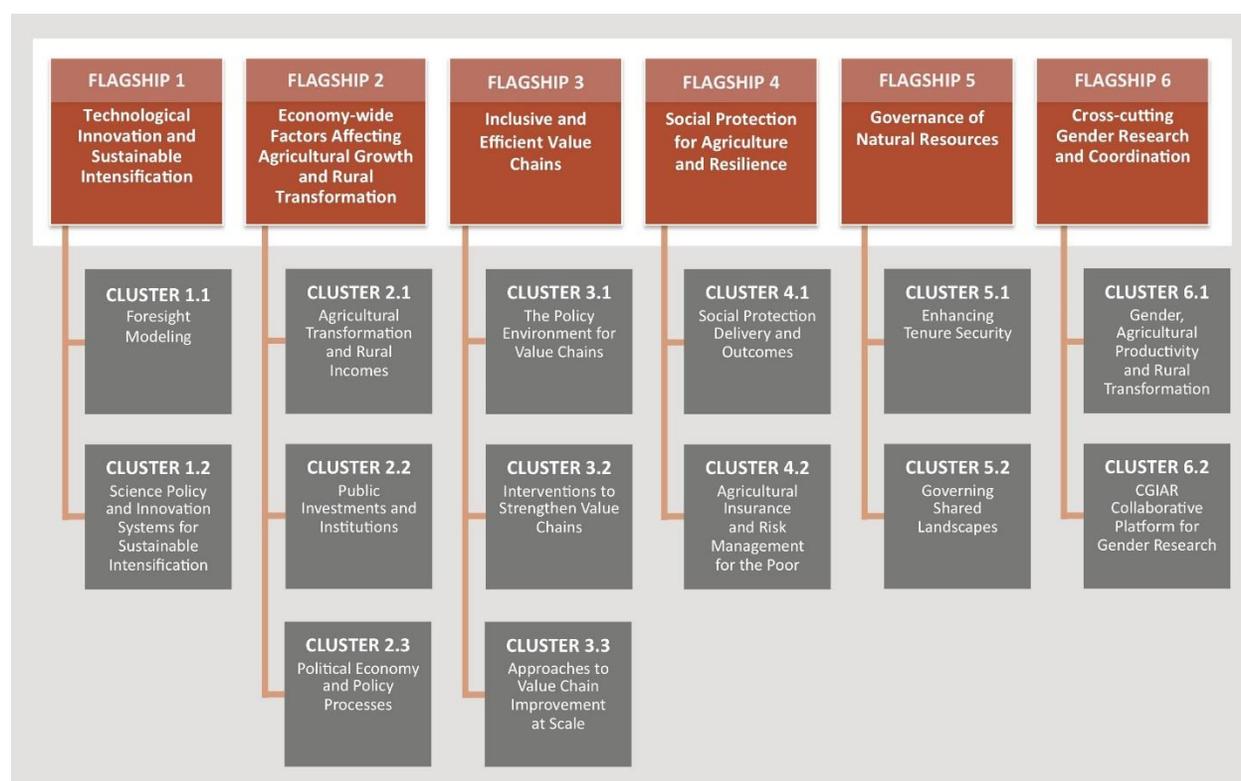
PIM's Youth Strategy includes outreach to interact with partners and stakeholders. The [PIM website](#) includes regular posts on the topic.

Approximately one third of the work in Flagship 2 relates to youth employment, for a total of \$6.9M. About half of the gender analysis in Flagship 6 is age-disaggregated to capture life cycle impacts for both men and women; this represents approximately \$1.8M. For the other flagships, the level of intensity in addressing youth issues can be estimated at 10%, that is a total of \$6.5M for Flagships 1, 3, 4, and 5. The total **youth budget for 2017** is estimated at **\$15.2M**, or **16.4% of the total budget**.

## 1.0.6 Program structure and flagship projects

The PIM portfolio includes six flagships (Figure 1.0.6.1).

**Figure 1.0.6.1: PIM's flagships and clusters**



**Flagship 1 – Technological Innovation and Sustainable Intensification** investigates which lines of agricultural research are likely to have high payoffs over the decades ahead, where the research will be most relevant, and whether developing countries are investing enough and in the right ways to realize the payoffs. The work takes into account climate change, demographic trends, and economic changes affecting supply, demand, and trade. The distributional benefits of new technologies and management practices for women of all ages, young men, smallholders, and members of marginalized groups are probed. New approaches to tracking the adoption of technology are piloted, together with national partners, to serve as a foundation for systematic analysis of factors affecting adoption by different groups of people. Work is undertaken to clarify policy and institutional measures that either impede or encourage adoption, with particular emphasis on seed policy and biotechnology.

**Flagship 2 – Economywide Factors Affecting Agricultural Growth and Rural Transformation** examines the complexities of economic transformation (that is, the shift from agriculturally-based economies to more diversified ones) in the 21<sup>st</sup> century. Emphasis is placed on Africa south of the Sahara, where the transformation coincides with high population growth and an urgent need for job creation for young men and women. Researchers accordingly ask whether and how agriculture can grow and absorb labor, and what policy and institutional measures can facilitate this process. Decisions on public spending affect the pace and nature of rural transformation, and research teams track and evaluate the composition of budgets to help governments prioritize spending on needed public goods and services. Finally, this flagship also addresses

the political economy of the policy process—a new line of research that responds to the recommendations of external reviewers of PIM. Gender is addressed through survey work identifying occupational choices of young men and women and by analyzing how public spending benefits men and women differently.

**Flagship 3 – Inclusive and Efficient Value Chains** addresses the changing international, regional, and local contexts for agricultural markets, and investigates how smallholders, both men and women, can be integrated into the complex and demanding modern marketing arrangements. Researchers examine value chains to understand at which points along them inefficiencies enter and how, who bears the cost of these inefficiencies, and which are most damaging to overall welfare, particularly welfare of smallholders, both men and women, and members of marginalized groups. Measurement of waste and loss along the value chain provides insight into cost-effective remedial measures. Research teams work with businesses, NGOs, and governments to test interventions to strengthen value chains and increase their inclusiveness.

**Flagship 4 – Social Protection for Agriculture and Resilience** seeks to understand how best to design social protection programs, and how these programs complement programs supporting agricultural growth and rural transformation. An understanding of which instruments for delivery (cash, vouchers, food, or other) work best for which groups, how programs should be targeted, how large they should be, how beneficiaries can graduate (that is, become resilient enough to manage without the benefits of the program), and how safety nets can promote better nutrition, can help inform design and implementation of programs. Work on social protection and nutrition is undertaken jointly with A4NH. Insurance, credit, savings, and money transfers can assist poor households to prepare for shocks, and can also make public transfers faster. The gendered nature of vulnerability, and instruments to address it, are major areas of focus.

**Flagship 5 – Governance of Natural Resources** addresses the policy and institutional foundations for improved management of natural resources, whether held in common or individually. Poorly defined rights and a weak commitment to shared governance lead to degradation of resources and low provision of ecosystem services. Research in flagship 5 investigates where and how tenure insecurity constrains productive and sustainable management of natural resources, and how community groups and individuals who use the same resources in different ways can govern them with recognition of multiple claims and preservation of ecosystem services. Much of the work focuses on land, but rights to other resources, such as water, fish stocks, and forests, are also covered. The rights of women and members of marginalized groups, their roles in stewardship of resources, and the contributions of natural resources to women's livelihoods receive particular attention.

**Flagship 6 – Cross-cutting Gender Research and Coordination** houses work on design of tools and methods for gender analysis, assists with prioritization of PIM's gender research agenda, draws together separate research strands to clarify implications for agricultural productivity, and hosts the CGIAR Collaborative Platform for Gender Research. A fuller understanding of the relationships between gender and productivity and how interventions that empower women could change these relationships requires more collection of sex-disaggregated data, and new tools for analyzing these data. Flagship 6 develops these, and also examines how women's opportunities change with rural transformation.

Figure 1.0.6.2 positions the work of PIM within a simple conceptual framework based on **growth, sustainability, and inclusion** – three important dimensions of an enabling policy environment. Although all PIM flagships contribute to each dimension, some have greater focus on particular dimensions. Figure 1.0.6.2 shows in simplified form the primary contributions of each flagship. Growth is particularly emphasized in the work on technology adoption (Flagship 1), transformation (Flagship 2), and value chains (Flagship 3). Sustainability is emphasized both in Flagship 5 (natural resource governance) and Flagship 1

(technological innovation). Inclusion is a focus of the work on social protection (Flagship 4), governance of natural resources (Flagship 5), youth employment (Flagship 2), and value chains (Flagship 3). Gender research (Flagship 6) contributes equally to each dimension.

**Figure 1.0.6.2: Conceptual framework for PIM**



Several research areas are pursued through **collaboration among flagships**. Teams from Flagships 2 and 5 explore changes in land tenure arrangements, and their implications for rural dynamism, structural transformation, and youth employment in agriculture. The gender and Flagship 1 teams jointly consider gender dimensions of adoption of technology. Work on youth employment brings together teams from Flagships 2 (transformation and growth), 3 (value chains), and 4 (social protection). The political economy team within Flagship 2 interacts with others within PIM to explore the inner workings of policy processes, for example with Flagship 1 to examine the political economy of investment in national agricultural research decisions.

## 1.0.7 Cross-CRP collaboration and site integration

### Cross-CRP collaboration

All six PIM flagships have links with other CRPs, as shown in Annex 3.7 and described in the flagship narratives.

For example, the PIM **foresight modeling** team (Flagship 1) includes staff from all Centers and interacts with all CRPs. The foresight modeling team parameterizes promising technologies and management practices, and develops scenarios to assist in prioritization within the CRPs, across CGIAR, and in the broader development community. During Phase 2, PIM will continue to fund the basic modeling tools, regular training, and the input of Center staff required to keep the biophysical content up to date and assure wide relevance of the scenarios. The other CRPs will fund the analysis most applicable to their specific mandates, and participate in the periodic fora to share results.

For work on **value chains** (Flagship 3), PIM will focus on development of research methods and tools and issues that cut across value chains (such as types of contracts), while other CRPs will fund research on specific value chains, and participate in periodic fora to share results. Specific joint work with the AFS CRPs, CCAFS, and A4NH is shown in Annex 3.7. New methods to measure postharvest losses are being developed for application across all AFS CRPs.

The team working on **natural resource management** (Flagship 5) benefits from the historic linkages among Centers through the CAPRI program, and this has evolved into coordinated work plans among PIM, WLE, FTA, and CCAFS.

Collaboration on **gender** (Flagship 6) will continue to focus on development of tools and methods for collecting and analyzing sex-disaggregated data, and pursuit of joint research topics to be agreed during the convening of the CGIAR Gender Network in October 2016. In Phase 2, PIM will host the CGIAR Gender Platform.

PIM's expanded work program on seed systems (Flagship 1) will be conducted in collaboration with AFS CRPs, particularly MAIZE, RTB, and WHEAT, and with the Genebanks Platform. PIM's Flagship 2 team will work with WLE on rural-urban linkages and agrifood systems for expanding cities and towns. The collaboration on insurance and resilience to shocks (Flagship 4) with CCAFS, MAIZE, and other AFS CRPs initiated during Phase 1 will be further developed.

**The tables in Annex 3.7 provide further detail on cross-CRP collaboration.**

PIM will convene an annual meeting of CGIAR social scientists to strengthen professional connections and share results.

### Site integration

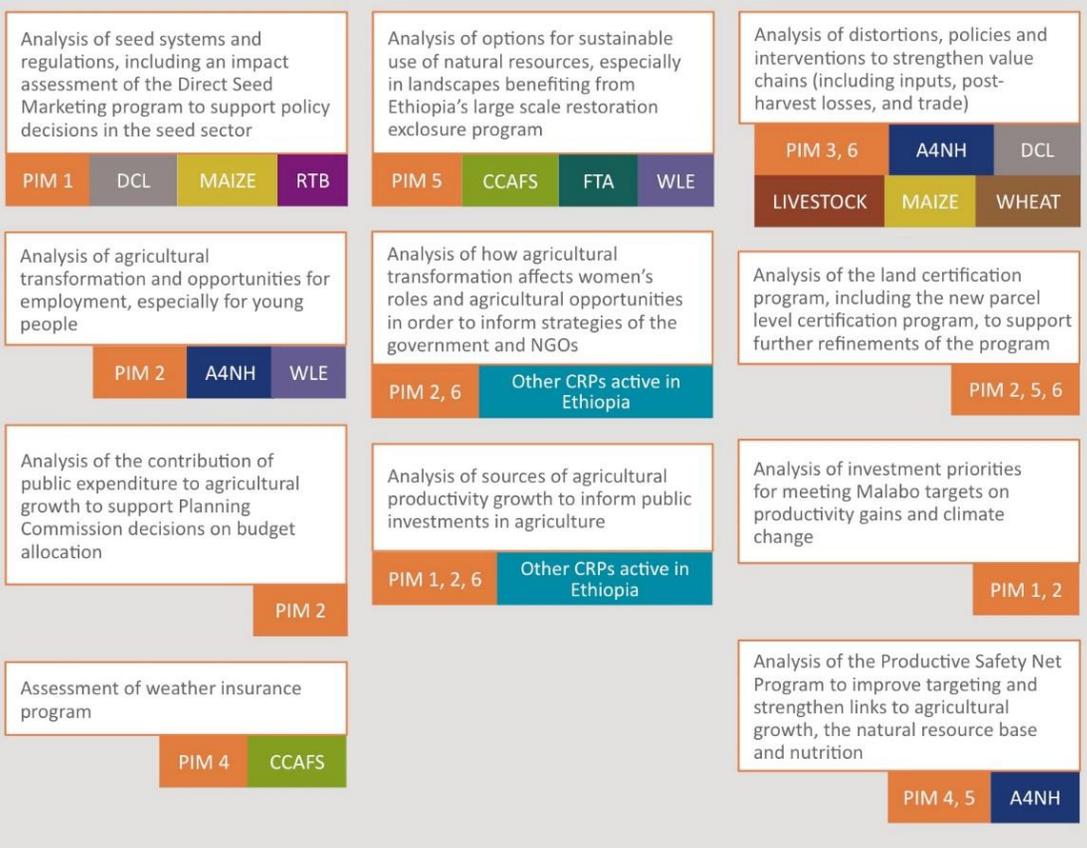
Within the process of CGIAR country collaboration, PIM will provide diagnostic assessments of the enabling environment to assist in identifying policy constraints, and subsequent analysis to develop options for reform. **An example of how each of PIM flagships contributes to collaboration in Ethiopia is presented in Figure 1.0.7.1.**

**Figure 1.0.7.1: PIM’s contributions to engagement of CGIAR with Ethiopian partners: Case study showing connections between and among flagships in PIM and links with other CRPs**

Ethiopia has experienced a decade and a half of strong agricultural growth, most recently (2008-2011) at 5% annually. Productivity of land and labor has increased modestly from very low initial levels. Growth in total factor productivity has averaged about 1.4% annually (although higher in recent years), suggesting that growth has come primarily from expanded area, a growing labor force, and shifts to higher valued products. Investment in agricultural science has grown in recent years, but remains small relative to agricultural GDP – just under one quarter of the relative spending of neighboring Kenya. Ethiopia’s policies on marketing and trade have improved markedly since 2008, passing incentives to producers that underpin the recent growth, but considerable room for improvement remains. Strong rural growth and a large program of social protection for the poorest have combined to reduce rural poverty from an estimated 51% in 2000 to an estimated 28% in 2011, with a corresponding reduction of hunger of 40% as measured by the Global Hunger Index. *(Each element of this overview of the enabling environment, with the exception of data on hunger, draws on work within the PIM flagships.)*

PIM, through the Ethiopia Strategy Support Program and other avenues, has used long-standing relationships with the Ministry of Agriculture and Natural Resources, Ministry of Finance and Economic Development, Planning Commission, Agricultural Transformation Agency, Ethiopian Institute of Agricultural Research (EIAR), and Ethiopian Development Research Institute to identify a set of research areas that underpin continuation of favorable trends in the enabling environment within the framework of the Growth and Transformation Plan II. For Phase 2, PIM has also consulted with other CRPs, and supports the effort of the CGIAR site integration team to formalize a linkage with the existing Rural Economic Development and Food Security (RED-FS) working group mechanism, which includes main government agencies and development finance organizations. It has been agreed for CGIAR to co-chair the task force on Research and Technology.

The topics below are addressed by the PIM flagships individually, jointly, and in conjunction with other CRPs as shown:



The PMU Senior Research Fellow attended [three national consultations in 2015](#) (Ethiopia, Nigeria, and Tanzania). PIM was also represented in the consultations in Bangladesh, Ghana, India, Malawi, Nicaragua, and Vietnam. Of the collaboration countries, PIM will work most in **Bangladesh, Ethiopia, Ghana, India, Malawi, Nicaragua, Nigeria, Tanzania, Uganda, and Vietnam**. The IFPRI Country Strategy and Support Programs active in Ethiopia, Ghana, Malawi, and Nigeria position PIM well to contribute to national policy dialogues in these countries.

PIM is also engaged in a number of countries not designated as CGIAR countries of collaboration, but in which Centers contributing to PIM have a long-standing presence. A table of countries noted in this proposal (by flagship) is available [here](#); this list is not exhaustive, and will change over the six years of implementation.

## 1.0.8 Partnerships and comparative advantage

The definition of **comparative advantage** used in design of the PIM program has three components: (a) researchers are recognized as technical experts in the field in question, and able to deliver excellence in research; (b) the work proposed is relevant to the SLOs and PIM can make a significant contribution to the portfolio-wide effort; (c) although other providers may be active in the same space, PIM brings a unique perspective recognized by partners and end-users. Component (a) is assessed according to metrics of quality of science. Component (b) reflects interactions between and among CRPs to contribute to outcomes in a given geography, such as PIM's contribution to assessing the enabling environment for agricultural growth in the CGIAR countries of collaboration. PIM's unique attributes referenced in component (c) often relate to the ability to link the developmental topic to agricultural issues and to link social science research with agronomy and biology. Uniqueness may also derive from a long-standing in-country presence and reputation for objectivity and quality. **Table 1.0.8.1 illustrates how each flagship addresses the three components of comparative advantage.**

Drawing on this definition of comparative advantage, PIM researchers produce an array of **public goods** mainly comprised of high-quality publications, tools and methods, datasets, improved design of development programs, and options for policy reforms and strengthening institutions. Users of these goods include researchers, development practitioners, funding agencies, governments, private firms, and the media.

PIM selects partners in accordance with the concept of comparative advantage as described above. Of the Window 1-2 funding for research, 35% is budgeted for **CGIAR Centers** other than the Lead Center and for **external partners**. Of the amounts allocated to CGIAR Centers (including Lead Center), 25% is contracted to external research partners.

**Managing partners** are large contributors and may play roles in flagship or cluster leadership. They include three external organizations (Michigan State University, Wageningen University and Research Centre, World Vision International), and five CGIAR Centers: IFPRI, CIAT, CIFOR, CIP, ICRAF. Managing partners were selected based on their participation in PIM in Phase 1 and expressed interest to contribute at a significant level in Phase 2. They are engaged across several flagships, and in some cases will serve on the Management Committee. **Strategic partners** contribute more selectively to the program, and do not participate in program management. Strategic partners engage in flagships or activities, rather than across the program. Among those are external partners (e.g., ASARECA, CCARDESA, CORAF, FAO, FARA, IFAD, OECD, World Bank) and CGIAR Centers (Bioversity International, CIMMYT, ICRISAT, ILRI). **Collaborative**

**partners** include CGIAR Centers with a focused contribution in a limited number of activities (AfricaRice, ICARDA, IITA, IRRI, IWMI, WorldFish), and hundreds of other organizations. Collaborative partners are distinguished from strategic partners by the size and scope of their engagement, and, in some cases, by the duration of joint work. In addition to these types of partners, PIM works with **other CRPs** (see Annex 3.7).

**Private-sector** and **NGO** partners are active in research on seed policy, input supply, and regulation of biotechnology. Work with the private sector is planned to expand in Phase 2, particularly on seed systems.

Each flagship works closely with **national counterparts**. All Participating Centers have historic relationships with national and local partners. The IFPRI CSSPs (in Bangladesh, Ethiopia, Egypt, Ghana, Malawi, and Nigeria) are among the important vehicles for these partnerships.

**Table 1.0.8.1: Comparative advantage of the PIM flagships**

<b>Flagship / Component of comparative advantage</b>	<b>Expertise and ability to deliver excellence</b>	<b>Significant contribution to CGIAR-wide effort towards SLOs</b>	<b>Unique perspective</b>
<b>Flagship 1</b>	<ul style="list-style-type: none"> <li>• Frontier level modeling skills of foresight team</li> <li>• Active engagement and leadership in the Agricultural Model Intercomparison and Improvement Project (AgMIP)</li> <li>• Expertise in science policy (including biotechnology), seed systems, extension services, and analysis of adoption</li> </ul>	<ul style="list-style-type: none"> <li>• Quantitative foresight modeling for analysis of scenarios to inform investment choices</li> <li>• Policy dimensions of technology adoption, seed systems and extension complementary to AFS CRPs</li> <li>• Effective communities of practice for building capacity in ex ante and ex post analyses of technology adoption and impact</li> </ul>	<ul style="list-style-type: none"> <li>• Medium and long term perspective in foresight</li> <li>• Ability to work at a range of geographic scales from local to global</li> <li>• Agronomy and policy together for science policy research</li> <li>• Objectivity across commodities</li> <li>• Focus on policy and institutional aspects of technology adoption</li> <li>• Long history of engagement with NARs to track investment in research</li> </ul>
<b>Flagship 2</b>	<ul style="list-style-type: none"> <li>• Interdisciplinary team of researchers with a strong record of peer-reviewed publications in high impact outlets</li> <li>• Widely used toolkit of national economy-wide models and datasets to analyze effects of policy options</li> <li>• Methodological innovation in accounting of agricultural public spending</li> <li>• Tools for understanding policy processes and long-standing policy engagement in countries</li> </ul>	<ul style="list-style-type: none"> <li>• Analyses of agricultural transformation to inform research strategies of other CRPs</li> <li>• Models to capture interactions and economy-wide effects of interventions developed by other CRPs</li> <li>• Policy and program options to promote a conducive policy environment for technological dynamism and job creation in agriculture</li> <li>• Datasets and tools available for diagnosing the policy environment in countries of CGIAR collaboration</li> <li>• Political economy analysis of constraints limiting other CRPs</li> </ul>	<ul style="list-style-type: none"> <li>• National level and multi-sectoral perspective within CGIAR</li> <li>• Political economy analysis with deep knowledge of core agricultural issues</li> <li>• Long term engagement on policy issues in selected countries of collaboration and reputation for objectivity</li> </ul>

Flagship / Dimension of comparative advantage	Expertise and ability to deliver excellence	Significant contribution to CGIAR-wide effort towards SLOs	Unique perspective
<b>Flagship 3</b>	<ul style="list-style-type: none"> <li>• Global/regional trade models recognized for quality</li> <li>• Experience with measures of distortions in agricultural markets, including perspectives on data and methods used by others</li> <li>• Expertise and tools for rigorous evaluation of value chain interventions</li> <li>• Methodological leadership in measuring postharvest losses</li> <li>• Evaluation (with partners) of approaches to scaling up interventions</li> <li>• AGRODEP network for capacity building</li> </ul>	<ul style="list-style-type: none"> <li>• Explanation of how changing trade patterns affect returns to technologies developed by AFS CRPs</li> <li>• Identification of market opportunities for AFS CRPs' commodities</li> <li>• Convening of community of practice (CGIAR and external) to build capacity in value chain analysis</li> <li>• Strategic prioritization of value chain research within CGIAR</li> <li>• Tools and methods for value chain analysis</li> <li>• Systematic approach to assessing approaches to scaling up of interventions</li> </ul>	<ul style="list-style-type: none"> <li>• Objectivity across commodities</li> <li>• Relationships of trust with trade negotiating teams of developing countries, most of whom have little knowledge of agriculture</li> <li>• Quantitative analyses for rigorous measurement</li> <li>• Learning across value chains of importance in target countries of CGIAR</li> <li>• Increase analytical rigor in a field dominated by practitioners</li> <li>• Engagement with private sector and implementation partners in assessing impact</li> </ul>
<b>Flagship 4</b>	<ul style="list-style-type: none"> <li>• Researchers recognized as leaders in the field</li> <li>• Extensive experience in conducting rigorous impact evaluations of social protection programs in 17 countries</li> <li>• Established relationships with insurance companies interested in outreach</li> <li>• Long standing partnerships with social protection funders and implementers</li> </ul>	<ul style="list-style-type: none"> <li>• Management of risk can facilitate adoption of technologies developed by AFS CRPs</li> <li>• Ability to bring social protection and insurance into CGIAR efforts to promote resilience in CGIAR countries of collaboration</li> <li>• Strategies to improve complementary interventions in social protection and agriculture for the poor</li> <li>• Evaluation of contribution of labor-intensive public works and NRM</li> <li>• Contribution of social protection to food consumption and nutrition outcomes</li> </ul>	<ul style="list-style-type: none"> <li>• Dual commitment to analytical rigor (publications) and practical applications (program evaluation), including for programs operating at scale</li> <li>• Analysis of the how social protection can enable poor households to increase adoption of agricultural technologies and increase productivity</li> <li>• Probing complementarity of social protection, insurance, and agricultural production</li> </ul>

Flagship / Dimension of comparative advantage	Expertise and ability to deliver excellence	Significant contribution to CGIAR-wide effort towards SLOs	Unique perspective
<b>Flagship 5</b>	<ul style="list-style-type: none"> <li>• Tradition of expertise in institutions for natural resource management (especially through CAPRI)</li> <li>• Multi-disciplinary teams with mixed methods</li> <li>• Long standing partnerships with global, regional and national organizations in land tenure and common property</li> <li>• Linkages with partners in Africa and South Asia</li> </ul>	<ul style="list-style-type: none"> <li>• Complements the technical research on NRM of other CRPs by addressing institutional dimensions</li> <li>• Analysis of landscape effects across CRPs</li> <li>• Community of practice on property rights and collective action</li> <li>• Ability to leverage learning across CRPs</li> </ul>	<ul style="list-style-type: none"> <li>• Analysis of tenure across resources</li> <li>• Common and individual property</li> <li>• Emphasis on equity outcomes for poor, women, marginalized people</li> <li>• Agricultural innovation within a landscape context</li> <li>• Innovative methods for impact (e.g. serious games for collective action; “collaborating for resilience” dispute resolution)</li> </ul>
<b>Flagship 6</b>	<ul style="list-style-type: none"> <li>• Strong quantitative skills for understanding gender roles and effects of interventions</li> <li>• Experience collecting sex-disaggregated data</li> <li>• Track record in development of tools, e.g. Women’s Empowerment in Agriculture Index</li> <li>• Partnership with national and global research organizations, aid agencies, IFIs, NGOs, and foundations</li> </ul>	<ul style="list-style-type: none"> <li>• Prioritization, coordination, and capacity building functions for gender research across CGIAR through the gender platform</li> <li>• Understanding of gender dynamics in decision-making, time allocation and control over assets to inform CRP intervention strategies</li> </ul>	<ul style="list-style-type: none"> <li>• Quantifying gender relationships in agriculture where evidence base is weak</li> <li>• Evaluation of interventions to empower women in agriculture</li> <li>• New perspectives on joint decision making by men and women</li> </ul>

**Table 1.0.8.2 provides a list of partners involved in developing this proposal**, through the [PIM proposal development collaborative platform](#), participation in a PIM extended team meeting in November 2015 and/or in meetings at flagship/cluster levels, electronic contributions, etc. Records of interactions with partners on the Phase 2 agenda can be found [here](#).

**Table 1.0.8.2: Partners involved in PIM proposal development**

Types of partner	Partners
CGIAR Centers and CRPs	All
Research institutes and universities	Cornell University, Institute for Development Studies, Michigan State University, Pretoria University, Pennsylvania State University, Sokoine University, and Wageningen University and Research Centre
National agricultural and policy research institutes in low- and middle-income countries	Advanced Research Center Egypt, Ethiopian Institute of Agricultural Research, Indian Council of Agricultural Research, Instituto Nacional de Investigacion Agrícolas y Pecuarias, Nigerian Agricultural Research Council, Policy Research for Development (REPOA) Tanzania
Global organizations and international financial institutions	Food and Agricultural Organization of the United Nations, Global Forum for Agricultural Research, International Fund for Agricultural Development, International Finance Corporation, International Land Coalition, Organisation for Economic Co-operation and Development, UN Women, World Bank, and the World Food Programme
Regional organizations	African Center for Economic Transformation, African Union Commission/New Partnership for Africa's Development/Comprehensive Africa Agriculture Development Programme, African Union Land Policy Initiative, African Women in Agricultural Research and Development, Association of Southeast Asian Nations, Alianza de Aprendizaje Perú, Association for Strengthening Agricultural Research in Eastern and Central Africa, Central American Learning Alliance, Conseil Ouest et Centre Africain pour la Recherche et le Développement Agricoles, Forum for Agricultural Research in Africa, Inter American Institute for Cooperation on Agriculture South Asian Association for Regional Cooperation, and United Nations Economic Commission for Africa
Nongovernmental and community organizations, civil society (including farmer organizations)	AGRA, Concern Worldwide, Catholic Relief Services, Foundation for Ecological Security (India), Eastern Province Farmers Cooperative (Zambia), Global Forum for Rural Advisory Services, International Rescue Committee, Sustainable Food Lab, Technoserve, World Vision International, and Netherlands Development Organization (SNV)

### 1.0.9. Evidence of demand and stakeholder commitment

Much of PIM's research is undertaken in response to **specific requests from governments or partners**. For example, work programs of the IFPRI Country Strategy Support Programs in Bangladesh, Egypt, Ethiopia, Ghana, Malawi, and Nigeria are agreed jointly with the clients through periodic consultations. PIM researchers collaborate regularly with counterparts at the Food and Agriculture Organization of the United Nations (FAO), the International Fund for Agricultural Development (IFAD), the Organisation for Economic Co-operation and Development (OECD), the World Bank, and the World Food Programme (WFP), in addition to bilateral aid agencies and NGOs that continually seek PIM's analytical support. Many of the **tools and methods created by PIM are developed at the request of agencies and governments** and applied in their work.

Specific examples of demand for research that will continue into Phase 2 are noted below. The Forum for Agricultural Research in Africa (FARA) and the African Union (AU) have requested assistance with elaboration of implementation plans for the Science Agenda for Agriculture in Africa (Flagship 1). FAO has asked PIM to develop rural employment diagnostic tools, with a particular emphasis on youth employment (Flagship 2). Governments of Ethiopia, Nigeria, Pakistan, and Yemen have requested assistance in building datasets and country models to guide strategies for development and food security (Flagship 2). Unilever is collaborating with PIM researchers from the International Center for Tropical Agriculture (CIAT) to test interventions for value chains (Flagship 3). In response to a request from the G20, IFPRI and FAO have launched the [Technical Platform on the Measurement and Reduction of Food Loss and Waste](#); PIM's support for this effort under Flagship 3 provides an opportunity for other Centers to contribute as well. The Economic Community of West African States (ECOWAS) and the Comprehensive Africa Agriculture Development Programme (CAADP) have solicited support from PIM on regional trade (Flagship 3) and agricultural technology platforms (Flagship 1), respectively. The WFP regularly requests assistance on design and evaluation of safety net interventions (Flagship 4). The Foundation for Ecological Security (FES) has requested advice on developing common property management arrangements in India (Flagship 5). The United Nations Economic Commission for Africa has requested assistance on the Africa Land Policy Initiative (Flagship 5). USAID and the US Government's Feed the Future initiative work regularly with the Women's Empowerment in Agriculture Index (WEAI) team (Flagship 6). PIM researchers interact regularly with the many members of the Global Forum for Agricultural Research (GFAR) network, including national agricultural research systems (NARS), subregional organizations (SROs), farmer organizations, civil society organizations (CSOs), regional political organizations, and others.

Many of the partners listed above have **provided input into design of the program for Phase 2** (See Section 1.0.8). The broad participation in design of Phase 2 reflects the commitment of stakeholders to collaborate in implementation. Further commitment is translated into allocations of Window 2 funding by donors, and contractual agreements for funding through Window 3 and bilateral channels.

PIM has been an active participant in the **consultations in the CGIAR countries of collaboration**, and has made note of the key agricultural development challenges requiring attention on the policy level presented by national governments – most of which are well-aligned with PIM's research agenda. PIM researchers will contribute to the implementation plans that will be elaborated following upon the consultations (Annex 3.7).

## 1.0.10 Capacity development

<b>1. CapDev role in impact pathway</b>			
PIM contributes to increased capacity of researchers and implementation partners. Researchers are provided with analytical tools and training in how to use them; they also receive training in how to convey their results to actors in the policy process. Implementation partners receive assistance in translating the research findings into strategies, programs, and policies, and on how to monitor impact. Capacity building contributes to the four PIM channels of influence (see Section 1.0.3). PIM does not engage in downstream capacity building directly serving farmers and local market agents, since that is already a strong focus of extension services, NGOs, and large private companies.			
<b>2. Strategic CapDev actions</b> (see CapDev Framework)			<b>3 Please indicate any Indicators- from CapDev Indicators document or other - that could be used to track progress and contribution to CapDev Sub-IDOs</b>
<b>Intensity of implementation of chosen elements</b> (Please indicate High, Medium, Low) <b>Note- it is expected that no more than 3-4 elements would be implemented at High intensity</b>		<b>Give an indication of <u>how</u> chosen elements will be implemented</b> (Note: more space available for full plan in Annex)	
1. Capacity needs assessment and intervention strategy design	Medium	This is handled at project level, except for selected countries where program-level assessment will be made. Best practices for needs assessment in key CGIAR countries of collaboration will be introduced.	<ul style="list-style-type: none"> <li>Number of target partners in CRP's impact pathway with whom capacity needs assessments are carried out</li> </ul>
2. Design and delivery of innovative learning materials and approaches	High	This type of capacity building is performed where there is sufficient demand for materials to warrant the costs. Demand is expected to continue in the areas of gender research, use of global and national economic models, and value chain tools. PIM communities of practice play a key role in this type of capacity building.	<ul style="list-style-type: none"> <li>Number of partner organizations who use materials and approaches</li> <li>Number of people trained (disaggregated by sex, job/role, location, literacy)</li> </ul>
3. Develop CRPs and Centers' partnering capacities	Low	PIM leads several communities of practice, which contribute to strengthening CGIAR and CRP capacity in research and their utilization of these skills in collaborative projects with partners.	<ul style="list-style-type: none"> <li>Number of collaboration vehicles (communities of practice or platforms) managed</li> <li>Number of joint publications accepted to peer-reviewed journals</li> <li>Number of technologies/tools adopted across partnering organizations</li> </ul>
4. Developing future research leaders through fellowships	Low	Hosting of visiting fellows, post-docs and graduate students; targeted training courses (e.g. AGRODEP).	<ul style="list-style-type: none"> <li>Number of fellowship places provided (disaggregated by level, gender, department)</li> <li>Number of early career scientists from partner organizations participating in CRP research</li> </ul>

5. Gender-sensitive approaches throughout capacity development	High	A key role of PIM's strong gender team and CGIAR Gender Platform is to mainstream a gender lens on research, capacity, partnerships and outcomes. Gender focal points from all Centers/CRPs provide a vehicle for capacity development throughout CGIAR.	<ul style="list-style-type: none"> <li>• Number of CapDev activities in gender approaches/toolkits initiated (disaggregated by type)</li> <li>• Number of joint evaluations of projects/programs/ policies using gender analysis toolkit</li> </ul>
6. Institutional strengthening	High	Institutional strengthening focuses on improving systems and processes, for example priority setting and policy making. This is a component of all flagships, including the new cluster 2.3 on improving the enabling environment for policy making.	<ul style="list-style-type: none"> <li>• Number of policy-oriented knowledge sharing/training activities targeting human resources in NARS and other national research and policy organizations (disaggregated by focus – policy, technical)</li> <li>• Number of strategic plan recommendations implemented (disaggregated by agency)</li> <li>• Number of policy decisions taken (in part) based on engagement and information disseminated by CRPs</li> </ul>
7. Monitoring and evaluation (M&E) of capacity development	Medium	PIM monitors capacity development indicators (the list of those will include the new ones selected for Phase 2). The evaluation of IFPRI's capacity strengthening activities in 2014 provides a baseline for a follow up in Phase 2.	<ul style="list-style-type: none"> <li>• Number of internal/external evaluations of capacity strengthening activities undertaken</li> </ul>
8. Organizational development	High	PIM's investment in organizational development is focused on national agricultural research and extension organizations. This includes the work of ASTI and science policy research as well as individual studies.	<ul style="list-style-type: none"> <li>• Number of workshops or trainings provided on research management</li> <li>• Increase in funded research projects led by NARS and research partners</li> <li>• Number of knowledge products targeting end users (e.g. policy briefs)</li> </ul>
9. Research on capacity development	Medium	This mainly corresponds to assessment of capacity in partner organizations and assessment of these organization's methods for building capacity among their clients (e.g. in the area of extension methods).	<ul style="list-style-type: none"> <li>• Number of planning meetings with partners on capacity development initiatives</li> <li>• Number of capacity/ institutional related publications in research and extension systems</li> </ul>
10. Capacity to innovate	Medium	Capacity to innovate is achieved through interventions in other capacity development areas,	<ul style="list-style-type: none"> <li>• Number of groups and multistakeholder (innovation) platforms facilitated by CRP</li> </ul>

		especially development of tools (e.g. diagnostic tools in value chains).		
<b>4. Budget and resource allocation</b> (The CRP should demonstrate that budgets allocated for CapDev have a credible share of the total CRP budget (e.g. totaling around 10% although amounts may vary in individual Flagship budgets). IMPORTANT: Please indicate in Table 3 of the PIM the investments of each FP on the Capacity Development Sub-IDOs)				
<b>Budget for CRP (2017, \$M)</b>	<b>17.9 (19% of total budget)</b>			
<b>Budget for Flagships (2017, \$M)</b>	<b>F1</b> 4.5	<b>F2</b> 5.2	<b>F3</b> 2.6	<b>F4</b> 1.4
	<b>F5</b> 2.5	<b>F6</b> 1.8	<b>Management &amp; support</b> 0.1	

### 1.0.11 Program management and governance

PIM will be managed by the following bodies, with functions defined in approved terms of reference documents (ToRs):

- **IFPRI DG and Board of Trustees:** The IFPRI Director General (DG) and IFPRI Board are responsible for the performance of the program.
- **Program Director:** The Program Director manages the Program Management Unit (PMU), chairs the Management Committee, and is accountable to the DG of the Lead Center and the Lead Center Board for all aspects of the program’s performance.
- **Independent Steering Committee (ISC):** The current Science and Policy Advisory Panel (SPAP) will be replaced by an Independent Steering Committee consisting (as the present SPAP does) of 8–11 eminent scientists and policy advisers, mostly from outside CGIAR and representing relevant constituencies.<sup>6</sup> Nominations for the ISC will be canvassed from Participating Centers and partners by the IFPRI Board over the summer of 2016 and appointments will be made by November 2016.
- **Management Committee (MC):** Consisting of the Program Director, flagship leaders, the Gender Platform Coordinator, and two representatives of “managing partners” (with a total number of 10 people maximum), the MC will assist the Director *inter alia* in developing the work program, overseeing its implementation, assuring adequate monitoring and evaluation (M&E), implementing the partnerships strategy, and raising funds. The MC will be formed during the Fall of 2016.
- **Flagship and cluster leaders:** Flagship and cluster leaders will provide the strategic direction to the flagship/cluster, contribute to resource mobilization and development of partnerships, assist with design of detailed annual work programs, provide technical guidance for quality assurance, report on progress and budget execution, and track outcomes and impact. The Phase 1 flagship leaders have led the preparation process for Phase 2. Flagship leaders for Phase 2 were selected in July, 2016 through a transparent merit-based process. The PIM Management Committee approved TORs for the positions and selection criteria including experience and excellence in the field (as measured through records of ISI publications and evidence of contribution to policy and other PIM outcomes), demonstrated ability to raise funds and attract strong research and implementation partners, and managerial experience. Staff from all Participating Centers and selected external partners were invited to nominate candidates. Self-nominations were allowed. A selection panel consisting of two SPAP members, one external partner, one representative of the Lead Center, and one representative of the PMU assigned scores to the nominees. The flagship leaders selected through this process are named in the flagship narratives, and are drawn from CIFOR, IFPRI, Michigan State

<sup>6</sup> For an explanation of the composition of the ISC, see the [Management Response to the PIM evaluation](#).

University, Oxford University, and Wageningen University and Research Centre. In three cases in which leaders are new to PIM, they have been paired with experienced partners as co-leaders. Cluster leaders will be chosen by September, 2016 through a participatory process led by the appointed flagship leaders.

- **Program Management Unit:** A lean PMU, consistent with the need to contain management costs, will continue to handle operational and administrative aspects of the program. As much as possible, processes and tools will be common to several CRPs.
- **Consortium bodies:** PIM will report to and be guided by the relevant consortium bodies as per the guidelines to be established for the implementation of Phase 2.

A transparent process will be put in place for **budget allocations**, taking into account prospects for delivery and record of past delivery, quality of science, likelihood of impact, quality of partnerships, rigor of M&E, and mobilization of bilateral funding. With guidance from the Management Committee, the PMU will develop a proposed budget that will be presented to the ISC for endorsement and approved by the Board of the Lead Center.

The following **management actions will be taken in response to lessons learned in Phase 1:**

- In Phase 1 we observed limitations in the ability of Participating Centers' Focal Points to ensure coordination of inputs and connectivity of their Centers with PIM outside their own areas of expertise. As a consequence we will build a different coordination model at the flagship level, building on the successful communities of practice already functioning in PIM. Participating Centers will continue to be represented on the Management Committee.
- Program Participant Agreements are too cumbersome for partners with low levels of engagement in the program. Simpler contracts will be designed for these partners.
- TORs of people fulfilling various roles in the governance structure will be detailed and explicit, and roles and responsibilities of the various actors will be spelled out clearly for key program processes (reporting, work planning, quality control, and so on)
- An online system will be set up to improve tracking of outputs and outcomes. PIM has teamed up with CCAFS, A4NH, and WLE to develop a common online planning and reporting platform for Phase 2.
- In Phase 1 the Window 3/bilateral projects mapped to PIM have been related to the broad subject matter of PIM but not necessarily defined in a way that contributes to the program's priorities. In Phase 2 we will strive to mobilize bilateral funds proactively to support the program, instead of mapping bilateral projects after the fact. To this end, significant attention will be given to setting up processes and procedures for management of the bilateral/W3 portfolio at the outset of Phase 2. This includes improving information sharing on bilateral/W3 projects between the Participating Centers (including the Lead Center) and PIM, assessing projects at the proposal stage to see how well they fit with PIM's flagships and clusters, systematically conveying to flagship and cluster leaders information about the bilateral projects mapped to their flagships/clusters so that they can follow up with the project leaders and ensuring that outputs and outcomes from the bilateral/W3 projects are captured in PIM's M&E framework.
- Collaboration between Centers will be encouraged. Some Participating Centers lack sufficient expertise on certain research topics to contribute at the level of excellence required (that is, producing innovative peer-reviewed publications in well-regarded journals and engaging with strong implementation partners). In such cases, PIM will supplement this by building partnerships with external research organizations, and work to enhance the capacity of colleagues within the system through training and shared methodologies.

- In light of Phase 1 Window 1-2 (W1-2) funding cuts, funds will be allocated to high-priority activities, and increased efforts will be devoted to joint resource mobilization with Participating Centers/partners.
- In response to the interest of contributors to understand the use of W1-2 funds, allocation of these funds will be to activities that are strategically related to the objectives of PIM, with clear explanations on use.

The **management and support costs (including cross-cutting functions) for 2017** are estimated at **\$3.6M**, and represent **3.9% of the total PIM budget**. See Tables 1.1.4.1 and 1.1.6.1 in the CRP budget narrative for a disaggregated view of these costs.

### 1.0.12 Intellectual asset management

Intellectual Assets (IAs) will be managed in accordance with the [CGIAR principles on the management of IA](#) and the [Implementation Guidelines for the CGIAR IA principles on the management of IA](#).

IAs created as a result of the PIM activities include **publications, translations, and datasets**. PIM commits to **prompt and broad dissemination of research results** (see Section 1.0.13), with an emphasis on producing International Public Goods (see Section 1.0.8). Information on PIM's partnerships and dissemination strategies towards achieving global accessibility and impact maximization can be found in Section 1.0.3 and in the Communications Strategy.

As recommended in the study commissioned by the Global Forum on Agricultural Research (GFAR) on "Mechanisms by Which Centers of the CGIAR Consortium can support the development of appropriate policies and procedures for the recognition and promotion of farmers' rights", PIM's research contributes to promoting farmers' empowerment, especially through the work under Flagship 5 on tenure of land and rights to water, trees, fisheries, genetic resources, and the work under Flagship 6 on gender and women's rights. PIM publications referring to traditional knowledge will give appropriate credits to the holders/providers of such knowledge.

Given that for PIM IA management entirely overlaps with OA management, PIM will not put in place any CRP-specific IP governance/oversight mechanism, policy, or Focal Point, but will work with the IFPRI IP Focal Point on all matters related to IAs. The CGIAR IA Principles will be incorporated by reference in partnership agreements. PIM Management will request Participating Centers to include the cost of implementing IA principles (mostly making publications and datasets open-access) in project budgets, and ask for information about application of IA principles as part of the reporting process. The budget for IA management is the same as the budget for OA management (see Section 1.0.13).

### 1.0.13 Open access management

PIM will coordinate with IFPRI's Knowledge Management (KM) team on all matters related to the implementation of the [CGIAR Open Access and Data Management \(OADM\) Policy](#) and its [Implementation Guidelines](#), and build on synergies with IFPRI's Open access/Open data implementation plan. The CGIAR OADM Policy will be incorporated by reference in all PIM partnership agreements, and these agreements will include appropriate wording on open access/open data. Follow these links for more information on IFPRI's [Open Access Policy](#) and [Open Data Policy](#).

PIM Management will support early planning and budgeting at project level for open access of publications, data, and tools; information will be requested about application of OA principles at project level as part of the PIM annual reporting process. Awareness of the OADM Policy will be raised among PIM flagship and cluster leaders, to allow them to play an active role in ensuring that outputs of their flagship/cluster are compliant. The online Monitoring and Evaluation system to be implemented jointly with CCAFS, A4NH, and WLE in 2016-2017 will facilitate the systematic inclusion in the [IFPRI's digital repository](#) of all Participating Centers' outputs. The PIM Program Management Unit will liaise with IFPRI's KM team to improve procedures for effective discoverability of the PIM outputs. The newly created PIM communicators group will also contribute to this goal.

Annex 3.9 provides details on implementation of the OADM Policy by PIM.

Infrastructures and staff required to implement the OADM Policy are covered through overhead costs charged by the Lead Center, and include: maintenance of digital content collections; Online Public Access Catalog (OPAC)/library catalog systems; website development related to repositories; promotion and training in support of OA/OD. Additional costs specific to PIM research activities (essentially OA fees for journal articles) are budgeted for at project level under the 'Supplies and Services' category.

### 1.0.14 Communications strategy

PIM communications aim to **support PIM in achieving impact along the program's impact pathways and to facilitate efficient program delivery** (see PIM's full Communications Strategy appended to this proposal). Specifically, PIM's Communications seeks to (a) convey research results to raise awareness about the role of good policies, strong institutions, and well-functioning markets in achieving poverty reduction, improved nutrition and health, and good stewardship of natural resources; (b) inform global and national policy processes; (c) share best practices and lessons learned to support joint learning and cross-CGIAR collaboration; (d) demonstrate accountability to donors; (e) help secure funding for realization of the program's agenda; (f) inform collaborators and partners on program developments; (g) provide opportunities for feedback on the program as part of the monitoring and learning plan; and (h) support implementation of the PIM Partnership and Capacity Building Strategies.

PIM researchers, managers, and communicators work together and with PIM partners to synthesize research results and craft tailored communication products that are clear, interesting, and useful for the different target groups identified along PIM's four channels of influence. PIM organizes and participates in global and local events to engage with policy stakeholders and partners; disseminate research results; share knowledge; and provide training. PIM will further develop the program websites, blogs, and social media. Based on lessons learned in Phase 1, PIM aims to strengthen delivery of the communications function through improved planning of communications activities at program and flagship levels, and better coordination with Participating Centers and partners through setting up a PIM communicators group.

The **PIM communication budget for 2017** is estimated at **\$3.6M**, which represents **3.9%** of the total PIM budget.

## 1.0.15 Risk management

**Risks associated with achievement of outcomes are presented in Section 1.0.3.** This section presents dimensions of program management that carry risks, and associated mitigating measures.

**Long-term planning:** Uncertainty regarding Window 1-2 amounts limits the ability to plan long-term research efforts, and shifts the attention of PIM's researchers to more reliably funded bilateral projects.

*Mitigating measure:* PIM management alerts teams about the level of uncertainty at the start of the year and provides regular updates. Careful management of carryover provides some relief.

**Scope of the PIM agenda:** The PIM agenda is broad, and many partners are interested in working with the teams. At the same time, CGIAR is encouraged to focus efforts on a smaller number of countries than in the past. The program thus faces twin pressures to be inclusive and work in many countries with many partners and to focus more narrowly on a subset of countries and issues.

*Mitigating measure:* Teams are encouraged to be selective, include CGIAR countries of collaboration where appropriate, and explain choices.

**Quality assurance for PIM-branded products:** PIM faces a reputational risk due to the difficulty in applying common standards of quality control to the PIM-branded products.

*Mitigating measure:* PIM Management encourages use of the [PIM Branding and Acknowledgment Guidelines](#). In Phase 2, results-based management will reward delivery of high-quality, peer-reviewed publications.

**Knowledge of execution of Participating Partners' budgets:** PIM's Participating Centers do not have common or linked financial systems. Budget planning and execution is consequently opaque, and management does not have access to real-time data on burn rates and deliverables.

*Mitigating measure:* PIM management works closely with the IFPRI Finance unit to monitor the use of the IFPRI funds (which represent about 80% of the bilateral and Window 3 funds and 60%-70% of the Window 1-2 funds). In Phase 2, spending against delivery for all Participating Partners will be monitored more closely (through email and Excel templates until a unified financial system is put in place), and results-based management will include assessment of budget execution on the part of participating partners.

**Establishment of indicators and targets:** PIM's indicators associated with the "Enabling environment" IDOs and Sub-IDOs are difficult to define. PIM has little influence on the measurement of these indicators; in most cases such measurement is the responsibility of national agencies.

*Mitigating measure:* PIM researchers contribute to strengthening the capacity of national counterparts responsible for measurement, such as central statistical agencies. Research teams do measurement directly on a small scale. PIM has convened a [workshop on best practice methods for assessing the impact of policy oriented research](#), and findings from that are incorporated into M&E efforts in Phase 2.

**Alignment of performance management systems:** In Phase 1, researchers and Focal Points who served on the PIM extended team were assessed by their line managers without input from PIM management. Focal Points reported to their Centers, and in some cases had instructions that privileged the interests of the Center over those of the program.

*Mitigating measure:* In Phase 2, PIM will rely on a management structure based on flagships, rather than Centers. Centers will be represented through the flagships in which they participate. PIM management will provide feedback to the line managers of the flagship leaders.

## 1.1 CRP Budget Narrative

### 1.1.1 General information

CRP Name	Policies, Institutions, and Markets
CRP Lead Center	IFPRI

### 1.1.2 Summary

At the meeting of CRP Directors and Consortium entities in Rome in November 2015, a projected size of **\$92.8 million was assigned to PIM in 2017, including \$18.8 million (20%) in Window 1-2 funding.**

The budget planning builds in **modest assumptions about growth** in the outer years: program amounts are raised at two year intervals twice over the six year implementation period, each time by 3%. This reflects realism in estimations of available funding.

Flagship Name	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Total
FP1-Technological Innovation and Sustainable Intensification	22,298,971	22,298,971	22,967,940	22,967,939	23,656,978	23,656,978	137,847,778
FP2-Economywide Factors Affecting Agricultural Growth and Rural Transformation	20,726,763	20,726,763	21,348,566	21,348,566	21,989,023	21,989,023	128,128,702
FP3-Inclusive and Efficient Value Chains	17,022,768	17,022,768	17,533,451	17,533,451	18,059,454	18,059,454	105,231,345
FP4-Social Protection for Agriculture and Resilience	9,119,910	9,119,909	9,393,507	9,393,507	9,675,312	9,675,312	56,377,457
FP5-Governance of Natural Resources	16,486,630	16,486,630	16,981,229	16,981,229	17,490,665	17,490,665	101,917,047
FP6-Cross-cutting Gender Research and Coordination	3,564,959	3,564,959	3,671,909	3,671,908	3,782,065	3,782,065	22,037,866
Management & Support Cost	3,585,200	3,585,200	3,692,756	3,692,756	3,803,539	3,803,539	22,162,990
Strategic Competitive Research Grant	0	0	0	0	0	0	0
	<b>92,805,201</b>	<b>92,805,201</b>	<b>95,589,356</b>	<b>95,589,356</b>	<b>98,457,036</b>	<b>98,457,036</b>	<b>573,703,186</b>

### 1.1.3 CRP funding plan

Management and Support Cost are assumed secured and covered through Window 1-2 funding only.

With respect to Window 3/bilateral funding, in order to encourage Participating Centers to increase their mobilization efforts within PIM, we are using the assumption that each Center (other than the Lead Center) will bring to the program an amount of Window 3/bilateral funding corresponding roughly to 3.2 times their W1-2 allocation. The ratio of Window3/bilateral funding to W1-2 funding is higher for IFPRI based on historical data.

Based on IFPRI data about duration of bilateral/W3 contracts, we used the following assumptions to estimate the **secured portion of the bilateral and W3 funding**:

Year	2017	2018	2019	2020	2021	2022
Secured	Same as estimation for 2016	66% of 2017	33% of 2017	15% of 2017	0	0

Funding Needed	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Total
W1+W2	18,805,200	18,805,200	19,369,356	19,369,356	19,950,437	19,950,437	116,249,986
W3	26,412,800	26,412,800	27,205,184	27,205,184	28,021,339	28,021,339	163,278,647
Bilateral	47,587,199	47,587,199	49,014,816	49,014,816	50,485,260	50,485,260	294,174,553
Other Sources	0	0	0	0	0	0	0
	<b>92,805,199</b>	<b>92,805,199</b>	<b>95,589,356</b>	<b>95,589,356</b>	<b>98,457,036</b>	<b>98,457,036</b>	<b>573,703,186</b>

Funding Secured	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Total
W1+W2(Assumed Secured)	18,805,200	18,805,200	19,369,356	19,369,356	19,950,437	19,950,437	116,249,986
W3	16,665,283	10,999,087	5,499,543	2,499,792	0	0	35,663,706
Bilateral	28,082,291	18,534,312	9,267,156	4,212,343	0	0	60,096,103
Other Sources	0	0	0	0	0	0	0
	<b>63,552,774</b>	<b>48,338,599</b>	<b>34,136,055</b>	<b>26,081,491</b>	<b>19,950,437</b>	<b>19,950,437</b>	<b>212,009,795</b>

Funding Gap	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Total
W1+W2	0	0	0	0	0	0	0
W3	-9,747,516	-15,413,712	-21,705,640	-24,705,391	-28,021,339	-28,021,339	-127,614,940
Bilateral	-19,504,908	-29,052,887	-39,747,659	-44,802,472	-50,485,260	-50,485,260	-234,078,450
Other Sources	0	0	0	0	0	0	0
	<b>-29,252,424</b>	<b>-44,466,599</b>	<b>-61,453,299</b>	<b>-69,507,863</b>	<b>-78,506,599</b>	<b>-78,506,599</b>	<b>-361,693,390</b>

### 1.1.4 CRP management and support costs

See Table 1.1.4.1 at the end of Section 1.1.

For each flagship, PIM will cover funding for the equivalent of 30% FTE for **coordination activities performed by flagship leaders**. Following the guidance in the case when this percentage is below 50%, the corresponding costs are included in the **flagship budgets**. PIM will also cover the cost of a **flagship management support function** up to 50% FTE by flagship; the corresponding costs are included in the **program management costs**.

### 1.1.5 CRP Financial management principles

#### 1) Allocation process of the CRP 2017-2022 budget to the flagships for W1+2

- **Process of initial budget formulation for inclusion in the proposal:** Flagship leaders were requested to indicate which Centers and external partners will be involved in the work, and their level of involvement. One of the lessons learned from Phase 1 is that allocations to Centers are more closely aligned with the program's agenda if they emerge from substantive design at flagship level; therefore, Participating Centers have made their interest known through the flagship leaders, and have not been invited to submit requests directly to the Program Management Unit.
- **Subsequent budgeting processes:** The process is iterative, and amounts are likely to change during the course of implementation. The commitment to results-based management will necessitate adjustment in response to varying levels of performance of contributing entities. Priorities of countries in which engagement is greatest may change, necessitating adjustment in

the work program. Realized funding from various sources may differ from projected amounts. A transparent process will be put in place for budget allocations, taking into account prospects for delivery and record of past delivery, quality of science, likelihood of impact, quality of partnerships, rigor of M&E, and mobilization of bilateral funding. With guidance from the Management Committee, the PMU will develop a proposed budget that will be presented to the ISC for endorsement and approved by the Board of the Lead Center.

## 2) The level of budget ownership of the flagship leaders (tracking, reporting, revising, etc.)

Budget execution is tracked at the PMU level, and discussions will be held between the PMU and flagship leaders on flagship-level budget execution.

## 3) Rules and expectations around annual variances for flagship and participating partner budgets

In addition to the quarterly financial reports expected from the Participating Centers/partners (either submitted through the System Office or directly to PIM), **accounts of actual expenditures at the project level will be required from Participating Centers/partners on a six-monthly basis, and examined jointly with accounts of delivery.** Discussions will be held between the PMU, flagship leaders, and Participating Centers/partners to remedy cases of under-spending and under-delivery. Major revisions to work plans will require approval by the PMU and flagship leader. Past level of spending and delivery will be used as criteria for allocations.

PIM expects that the System Office will remedy the absence of a real time systemwide system for tracking budgets, after which CRPs can introduce a more detailed analysis of burn rates.

## 4) Expected major capital investments (>\$25,000)

There are no plans to purchase capital equipment.

### 1.1.6 Budgeted costs for certain key activities

	Estimate annual average cost (USD)
Gender	27,992,911
Youth (only for those who have relevant set of activities in this area)	15,183,538
Capacity development	17,918,361
Impact assessment	5,140,122
Intellectual asset management	0
Open access and data management	0
Communication	3,583,453

#### Gender

The **PIM gender budget for 2017** is estimated at **\$28M**, which represents **30% of the total PIM budget**. The gender component of each flagship is derived by assigning a gender percentage to each of the Sub-IDOs that the flagship contributes to (see Table C of the Performance Indicators Matrix). For the Sub-IDOs under IDO CC2.1 on Equity and inclusion achieved, the gender percentage is assumed to be 100%. 100%

of the Flagship 6 budget is counted as gender budget. See Table 1.1.4.1 at the end of Section 1.1 for information about the gender component of the management and support costs.

Component of gender budget	2017 gender budget, in \$M	Percentage
Flagship 1	4.9	22
Flagship 2	5.8	28
Flagship 3	4.4	26
Flagship 4	3.3	36
Flagship 5	6.0	36
Flagship 6	3.6	100
Management and support	0.05	1.5
<b>TOTAL</b>	<b>28</b>	<b>30</b>

## Youth

Approximately one third of the work in Flagship 2 relates to youth employment, for a total of \$6.9M. About half of the gender analysis in Flagship 6 is age-disaggregated to capture life cycle impacts for both men and women; this represents approximately \$1.8M. For the other flagships, the level of intensity in addressing youth issues can be estimated at 10%, that is a total of \$6.5M for Flagships 1, 3, 4, and 5. The total **youth budget for 2017** is estimated at **\$15.2M**, or **16.4% of the total budget**.

Component of youth budget	2017 youth budget, in \$M	Percentage
Flagship 1	2.2	10
Flagship 2	6.9	33
Flagship 3	1.7	10
Flagship 4	0.9	10
Flagship 5	1.6	10
Flagship 6	1.8	50
Management and support	0	0
<b>TOTAL</b>	<b>15.2</b>	<b>16</b>

## Capacity development

The **PIM capacity development budget for 2017** is estimated at **\$17.9M**, which represents **19% of the total PIM budget**. The capacity development component of each flagship is derived by adding up the flagship contributions to the capacity development Sub-IDOs, i.e. Sub-IDOs CC2.1.3, CC3.1.2, CC4.1.1, CC4.1.2, CC4.1.4 (see Table C of the Performance Indicators Matrix). It is assumed that flagship contributions towards other Sub-IDOs do not count as capacity development. We add \$100K for capacity development activities at program level (see Table 1.1.4.1).

Component of capacity development budget	2017 capacity development budget, in \$M	Percentage
Flagship 1	4.5	20
Flagship 2	5.2	25
Flagship 3	2.6	14
Flagship 4	1.4	15
Flagship 5	2.5	15
Flagship 6	1.8	52
Management and support	0.1	3
<b>TOTAL</b>	<b>17.9</b>	<b>19</b>

### M&E and impact assessment

See Table 1.1.6.1 at the end of Section 1.1. The budget for M&E and IA represents **6%** of the total budget.

### Intellectual asset management

As explained in Annex 3.10, the budget for IA management is the same as the budget for OA management (see below).

### Open access and data management

PIM is fully committed to complying with the CGIAR Open Access and Data Management (OADM) Policy and its Implementation Guidelines. Major infrastructures and staff required to do so are covered through overhead costs charged by the Center, and include: maintenance of digital content collections; Online Public Access Catalog (OPAC)/library catalog systems; website development related to repositories; promotion and training in support of OA/OD. Additional costs specific to PIM research activities (essentially OA fees for journal articles) are budgeted for at project level under “Supplies and Services”.

### Communication

The **PIM communication budget for 2017** is estimated at **\$3.6M**, which represents **3.9%** of the total PIM budget. This includes: (a) flagship-level budgets (including publications and workshops and 0,3 FTE of a Communications Specialist for each flagship; see details in flagship budget narratives); (b) \$310K in the management and support costs to support the program-level communications strategy (see cost categories A6, B1, and B4 in Table 1.1.4.1).

Budget component	2017 budget, in \$K
Flagship 1	805
Flagship 2	750
Flagship 3	621
Flagship 4	344
Flagship 5	602
Flagship 6	150
Program-level communications activities (see Communications Strategy)	311
<b>TOTAL</b>	<b>3,583</b>

### 1.1.7 Other

The level of ambition of the PIM program requires mobilization of approximately \$75 million in bilateral/Window 3 funds annually. This calls for flexibility to address the priorities of funders in terms of country focus and thematic interest. **Window 1-2 funds are used primarily to support core elements of the program** that can be widely applied when matched with bilateral funds. These elements correspond to basic tools of policy-oriented and institutional analysis, and include, for example: maintaining and constantly upgrading the models and tools (IMPACT, social accounting matrices, SPEED database...), developing new methods for collecting sex-disaggregated data or tracking adoption of technologies, and developing interdisciplinary methods for institutional analysis and political economy research. Window 1-2 funds are also used for cross-country analysis on broad themes, such as rural transformation and youth employment; to strengthen science quality throughout CGIAR by supporting communities of practice; and to increase attention to the program’s thematic areas in CGIAR countries of collaboration. Given the breadth of the PIM program and the funding model, with dependence on all sources of funding, funds from different sources are often commingled in support of tasks that have been determined to fit within the priorities of PIM.

65% of PIM's W1-2 research funds are allocated to the Lead Center, and 35% to Participating Centers and partners. In Phase 1 IFPRI mobilized proportionately more Window 3/bilateral funds than did Participating Centers, with the result that about 80% of research funding from all sources was spent by IFPRI, and 20% by other Centers. **In Phase 2 we will encourage and provide technical support to Centers to mobilize Window 3/bilateral funds in the same proportion relative to Window 1-2 funds as IFPRI.** This should assure an increased contribution of Participating Centers to the program. In the indicative budget across sources of funding and years 76% of research funds are allocated to/mobilized by the Lead Center and 24% allocated to/mobilized by Participating Centers and partners. These proportions are indicative, and will be adjusted as mobilization of Window 3/bilateral resources on the part of Participating Centers becomes known.

**Table 1.1.4.1: Management and support costs budget components**

COST COMPONENT	Comments	AMOUNT BUDGETED						
		2017	2018	2019	2020	2021	2022	Total
<b>A. Basic components as were given in the guidance document</b>		<b>2,313,186</b>	<b>2,313,186</b>	<b>2,382,581</b>	<b>2,382,581</b>	<b>2,454,059</b>	<b>2,454,059</b>	<b>14,299,652</b>
A.1 Management fee charged by the Lead Center to handle CRP Finance and Administrative matters (Finance, accounting, reporting, contracts management, legal, HR, IT, communication-if handled by Lead Center)	General and administrative costs = 17% of direct costs.	609,484	609,484	627,769	627,769	646,602	646,602	3,767,708
A.2 Combines: CRP director including related cost – benefits and on-cost if customary (computer, vehicle lease and office space) based on percentage time allocation; infrastructure and general and administrative charges if CRP leader is not located at the Lead Center; financial and administrative support	Director 100%; Senior Research Fellow 50%; Senior Program Manager 100%; Senior Admin Coordinator 100%; Program Assistant 50%; Research Assistant 25%; Travel 40,000.	957,397	957,397	986,119	986,119	1,015,702	1,015,702	5,918,434
A.3 Flagship leader and regional coordinators only if a significant percentage time (>50%) is dedicated to managerial activities.	Flagship coordination activities = 30% FTE per flagship. Following the guidance (percentage < 50%), corresponding costs included in the flagship budgets.	0	0	0	0	0	0	0
A.4 CRP Management Committee and related costs		59,688	59,688	61,478	61,478	63,323	63,323	368,978
A.5 Independent Steering Committee (or Science Committee) and related costs		65,778	65,778	67,751	67,751	69,783	69,783	406,623
A.6 Communication activity related specifically to CRP communication and webpage (not if handled by Lead Center)	Graphic design, website.	49,800	49,800	51,294	51,294	52,833	52,833	307,854
A.7 CRP internal audit by the CGIAR Internal Audit Unit, or its future equivalent in the new System governance structure		33,200	33,200	34,196	34,196	35,222	35,222	205,236
A.8 CRP internal and external reviews (e.g. CCEEs and other evaluations and reviews), as well as IA	Impact assessment, evaluations, documenting research outcomes - see Section 1.1.6.	537,840	537,840	553,975	553,975	570,594	570,594	3,324,819

COST COMPONENT	Comments	AMOUNT BUDGETED						
		2017	2018	2019	2020	2021	2022	Total
<b>B. CRP-level cross-cutting components not mentioned in the guidance document</b>		<b>1,272,014</b>	<b>1,272,014</b>	<b>1,310,174</b>	<b>1,310,174</b>	<b>1,349,480</b>	<b>1,349,480</b>	<b>7,863,336</b>
B.1 CRP special events (e.g. CRP-wide program meetings)	Annual meeting of CGIAR social scientists and other events.	83,000	83,000	85,490	85,490	88,055	88,055	513,089
B.2 CRP leadership meetings (e.g. country coordinators, flagship leaders, cross-cutting coordinators)		41,500	41,500	42,745	42,745	44,027	44,027	256,545
B.3 CRP M&E coordination and systems (not including external evaluations and impact assessments)	Senior Research Fellow 50%, MARLO, MEL CoP, Impact webpage and publication, training sessions on planning for outcomes and learning from outcomes - see Section 1.1.6 for more information.	216,000	216,000	222,480	222,480	229,154	229,154	1,335,269
B.4 CRP communications, open access, IP assets, KMIS (including Lead Centre staff budgeted as direct costs not allowed in A6))	Communications Specialist 100% and related costs.	132,800	132,800	136,784	136,784	140,888	140,888	820,943
B.5 CRP capdev coordination		83,000	83,000	85,490	85,490	88,055	88,055	513,089
B.6 CRP gender and youth coordination	Program Assistant 50%.	43,949	43,949	45,268	45,268	46,626	46,626	271,686
B.7 CRP site integration support	Co-investment in site integration process.	99,600	99,600	102,588	102,588	105,666	105,666	615,707
B.8 Other: (specify)		572,165	572,165	589,330	589,330	607,009	607,009	3,537,007
Partnership	Management of relationships with partners and donors, catalyzing new partnerships.	223,565	223,565	230,272	230,272	237,180	237,180	1,382,032
Program Managers	Flagship management support function up to 50% FTE per flagship.	348,600	348,600	359,058	359,058	369,830	369,830	2,154,975
<b>C. Funding source: MSC budget is assumed funded from W1/2. Some CRPs have been successful in mobilizing W3/bilateral to support CRP-level cross-cutting initiatives. These are listed below:</b>		<b>0</b>						
C.1 Grant: (note name, donor; purpose)		0	0	0	0	0	0	0
		<b>3,585,200</b>	<b>3,585,200</b>	<b>3,692,756</b>	<b>3,692,756</b>	<b>3,803,539</b>	<b>3,803,539</b>	<b>22,162,989</b>

**Table 1.1.6.1: M&E and impact assessment budget components**

M&E investments	Types of costs included	Amounts budgeted					
		2017	2018	2019	2019	2021	2022
<b>M&amp;E</b>		<b>252,720</b>	<b>252,720</b>	<b>260,302</b>	<b>260,302</b>	<b>268,111</b>	<b>268,111</b>
Under MSC budget	Senior Research Fellow 50%, MARLO, MEL CoP, Impact webpage and publication, training sessions on planning for outcomes and learning from outcomes.	252,720	252,720	260,302	260,302	268,111	268,111
Under Competitive Grants Fund		0	0	0	0	0	0
Under flagship budgets		0	0	0	0	0	0
<b>IA</b>		<b>4,887,402</b>	<b>4,887,402</b>	<b>5,034,024</b>	<b>5,034,024</b>	<b>5,185,045</b>	<b>5,185,045</b>
Under MSC budget	\$250,000 for impact assessment + \$175,000 for evaluations related to downstream impact assessment + \$148,000 for flagship-level studies to document research outcomes.	573,000	573,000	590,190	590,190	607,896	607,896
Under Competitive Grants Fund		0	0	0	0	0	0
Under flagship budgets	Baseline assessments and ex-post studies (funded both through bilateral/W3 and W1-2 funding).	4,314,402	4,314,402	4,443,834	4,443,834	4,577,149	4,577,149
Flagship 1	Examples: use of foresight analysis for PIM's own ex-ante assessment; use of ASTI indicators on national investment in agricultural R&D to track PIM's own progress.	1,783,918	1,783,918	1,837,435	1,837,435	1,892,558	1,892,558
Flagship 2	Examples: use of economywide models to conduct ex ante and ex post assessments of policy outcomes to feed into impact assessments of PIM research.	621,803	621,803	640,457	640,457	659,671	659,671

M&E investments	Types of costs included	Amounts budgeted					
		2017	2018	2019	2019	2021	2022
Flagship 3	Examples: the value chain hubs will monitor the uptake of value chain tools by partners; evaluations of the effectiveness of value chains interventions will be used as part of impact assessment of PIM research.	851,138	851,138	876,673	876,673	902,973	902,973
Flagship 4	Examples: evaluations of national social protection programs will feed into impact assessment of PIM research.	455,995	455,995	469,675	469,675	483,766	483,766
Flagship 5	Examples: assessments of land tenure reform effects on farm investment will feed into impact assessment of PIM research; assessment of governance outcomes.	494,599	494,599	509,437	509,437	524,720	524,720
Flagship 6	Examples: the Gender Platform will include an M&E component capturing the impact of the platform on capacity outcomes.	106,949	106,949	110,157	110,157	113,462	113,462
<b>TOTAL M&amp;E + IA</b>		<b>5,140,122</b>	<b>5,140,122</b>	<b>5,294,326</b>	<b>5,294,326</b>	<b>5,453,156</b>	<b>5,453,156</b>

**Note: the amounts in this table are different from the amounts in A8 and B3 of Table 1.1.4.1 because they include general and administrative costs (separated in A1 in Table 1.1.4.1).**

## 2.1 Flagship 1: Technological Innovation and Sustainable Intensification

### 2.1.1 Flagship Project Narrative

#### 2.1.1.1 Rationale and scope

Flagship 1 assesses alternative scenarios for future food security to draw out their inherent challenges, analyzes technological solutions that could address the challenges, and examines the associated public policies and investments in science and innovation required to implement the solutions. Flagship 1 contributes primarily to the objectives of **growth** and **sustainability** (see Figure 1.0.6.2 in Section 1.0.6).

Lessons from modern history demonstrate that visionary policies and rapid technological change can achieve agricultural productivity growth and poverty reduction. However, lessons from the past are not sufficient to motivate action in today's world. The grand societal challenges set forth in the CGIAR Strategy and Results Framework (SRF) – growing competition for land, soil degradation, climate change, diminishing genetic resources, and the need for more nutritious and diverse diets – necessitate strong and compelling evidence and systematic exploration of alternative policy and investment interventions to underpin decision making. The interventions must accelerate the generation of effective technologies and practices, and their adoption by farmers in developing countries, including women and the youth. Production of such evidence requires a range of elements, including **rigorous foresight modeling and ex ante scenario assessments; ex post analyses of policies, programs, and technologies for sustainable intensification; and an understanding of the regulatory, policy, and institutional environment that is conducive to rapid innovation.**

The flagship addresses **four sets of research questions**:

- What are the key socioeconomic and biophysical drivers of change in agrifood systems? What challenges do these drivers present to achievement of sustainable food and nutrition security at global, regional and national scales?
- How can agricultural technologies, natural resource management practices, and infrastructure investments address these challenges in ways that manage trade-offs, protect natural capital, and sustain the provision of ecosystem services?
- How do investments by governments, the private sector, and other nongovernmental actors in agricultural research and development affect agricultural productivity growth and poverty reduction in developing countries? What are the implications of these investments for outcomes in developing countries and for the global agrifood systems?
- What alternative policies, investments, institutional mechanisms, and market-based incentives can accelerate innovation, and specifically the discovery, development and delivery of new technology products and services for agriculture in developing countries? How should extension and other programs be designed to include women and young people as service providers and clients, and will greater inclusiveness accelerate diffusion and adoption of technology?

The flagship is built around two closely related streams of work: **Cluster 1.1 on Foresight Modeling**, and **Cluster 1.2 on Science Policy and Innovation Systems for Sustainable Intensification**. Together, these two bodies of work strengthen the contribution of quantitative foresight modeling and scenario analysis for decision making; inform forward-looking science and innovation policy and investment choices by developing countries; and elucidate the institutional, market, and behavioural dynamics that underlie decisions regarding technological change by agricultural producers in developing countries.

Flagship 1 represents a unique effort to **investigate future scenarios for food and nutritional security by combining biophysical models for crops, livestock, biodiversity, and hydrology with economic modeling tools, global circulation models and climate change scenarios, and spatially explicit agricultural, land use, and household data**. This is complemented by an **innovation systems approach**, which consists of opening the “black box” of the research and development production function to examine the **processes** behind the products of R&D. This approach tackles the complicated relationships between and among (a) actors, assets, and processes engaged in the production, exchange, and use of knowledge; (b) actions of and interactions among these actors; and (c) the policy incentives, social norms, and economic institutions that influence actions and the associated outcomes. Innovation systems seen through this lens differ from simple linear processes of technology transfer.

The flagship team reflects collaboration between CGIAR researchers from all 15 Centers, most CRPs, and non-CGIAR partners, contributing a range of disciplinary perspectives, experience with different methods, and operational approaches that enrich the research and contribute to impact.

As a component of an Integrating CRP, this flagship takes **a global perspective that transcends a single crop, commodity, technology, or agroecological system. Applications of the scenario analysis and work on innovation systems are regional and national**, with current engagement in **Africa south of the Sahara** (Benin, Botswana, Burkina Faso, Cote D’Ivoire, Ethiopia, Ghana, Kenya, Malawi, Mali, Niger, Nigeria, Senegal, Tanzania, Uganda, Zambia, and Zimbabwe), **Asia** (Bangladesh, China, India, Indonesia, Laos, Myanmar, Nepal, Pakistan, Philippines, Thailand, Vietnam), **Latin America and the Caribbean** (Brazil, Colombia, Nicaragua, Peru), and the **Middle East and North Africa** (Egypt and Tunisia). The global perspective of Flagship 1 allows CGIAR and global partners to assess priorities over a horizon of several decades, and to position work accordingly. National applications allow national leaders to see scenarios for their own countries in a regional and global context, to identify priorities for national agricultural research, to assess the level of investment in agricultural research required, and to consider institutional reforms that will allow investments in science to earn high returns.

### **2.1.1.2 Objectives and targets**

Flagship 1 seeks to facilitate **the production in developing countries of a vibrant agricultural scientific capacity**: oriented toward practical applications for development, adequately funded, linked with the global scientific community (including CGIAR), staffed by qualified men and women, organized effectively, and working in partnership with smallholder farmers and other actors in the agrifood system. The research questions presented above are framed to generate the evidence and insights that will contribute to accomplishment of this objective.

Through work on technological innovation and sustainable intensification, Flagship 1 contributes to all three CGIAR System-Level Outcomes (SLOs) and many IDOs, with a variable level of contribution. Contribution to **Reduced poverty (SLO 1)** is major, through productivity growth and increased resilience of the poor to climate change and other shocks. Contribution to **Improved food and nutrition security for health (SLO 2)** is significant but indirect, and achieved largely through informing the work of scientists in A4NH. Contribution to **Improved natural resource systems and ecosystem services (SLO 3)** is major, and achieved through clarification of the impact of different development trajectories on natural resource use. The flagship makes a significant and direct contribution to the aspirational CGIAR targets on adoption of technology and rate of yield increase (Table 1 of the CGIAR SRF).

As the work of Flagship 1 aims to promote effective generation and adoption of agricultural technology, this flagship is most closely aligned to Sub-IDs under IDO 1.4 on Increased productivity. The flagship also directly supports cross-cutting Sub-IDs, which in turn have indirect effects on other Sub-IDs and IDs (for example in the area of nutrition). The Sub-IDs to which Flagship 1 contributes most are listed in Table 2.1.1.2.1, with additional illustration provided in Figure 2.1.1.3.1.

**Table 2.1.1.2.1: Contributions of Flagship 1 to the CGIAR Sub-IDs**

Sub-IDs	Relative contribution (%)
1.4.2 Closed yield gaps through improved agronomic and animal husbandry practices	20
1.4.4 Increased conservation and use of genetic resources	10
CC1.1.3 Improved forecasting of impacts of climate change and targeted technology development	20
CC2.1.2 Technologies that reduce women's labor and energy expenditure developed and disseminated	5
CC3.1.2 Increased capacity of partner organizations, as evidenced by rates of investment in agricultural research	5
CC3.1.3 Conducive agricultural policy environment	25
CC4.1.1 Enhanced institutional capacity of partner research organizations	5
CC4.1.2 Enhanced individual capacity in partner research organizations through training and exchange	10
Total	100

**Specific outcomes of Flagship 1 are:**

- **Improved capacity** of researchers to conduct foresight analysis and assess adoption and impact of technology, and of policy makers to use analytical tools and methods for making decisions related to agricultural technology, management practices, and public investments.
- **Increased use of foresight models, tools, and results for decision making** within international organizations, multilateral and bilateral donor agencies, global and regional think-tanks, CGIAR Centers and programs, and other relevant organizations; and greater awareness of the likely long-term impact of alternative innovations in agricultural technology, management practices, public policies and investments on productivity, prices, food and nutrition security, land and water use, and other socioeconomic and environmental outcomes. It is expected that in 2022 foresight models and results will be used by 12 regional and national research organizations or government agencies in Africa, Asia and Latin America and global development organizations as inputs to their priority-setting.
- **Increased use of studies on policies, regulations, and investment in support of agricultural science, technology, and innovation** by governments. It is expected that in 2022 such studies will be used by key government entities in at least three CGIAR countries of collaboration.
- **Improved public policy and investment choices in support of sustainable intensification of developing-country agriculture, and especially increased and sustained public and private R&D investment.** It is expected that in 2022 budget allocations for agricultural research will exceed projections of the 2012-2016 trend in five CGIAR countries of collaboration.
- **Increased adoption of promising technologies,** through improved policy environments,

regulatory frameworks, and organizational capabilities for scientific and technological innovation in developing-country agriculture, and the contribution of other flagships. It is expected that in 2022 adoption of selected promising technologies and management practices will be 20% above counterfactual (without supportive technology dissemination innovations and policies) in three CGIAR countries of collaboration.

### ***2.1.1.3 Impact pathway and theory of change (for each individual FP)***

The theory of change for Flagship 1 is nested in the general ToC shown in Figure 1.0.3.1. The teams primarily address **constraints to technological dynamism through barriers to adoption of technology and sub-optimal arrangements for agricultural research**, including levels of funding, research lines prioritized, and institutional arrangements linking science with applications. To overcome these constraints, researchers use all four channels of engagement described in Section 1.0.3 (influencing global policies and institutions, influencing regional and national policies and institutions, contributing to program design at the local level, and developing capacity of partners). The theory rests on the **assumptions** that: (a) research planners will adjust resource allocations based on information about likely pay-offs; (b) benchmarking of investments in agricultural research will influence budget allocations; (c) analysis of costs associated with institutional and regulatory constraints to technology coupled with analyses of the impacts of alternative policies and interventions will influence decisions to undertake reforms; (d) analysis showing the gendered impacts of decisions on research, regulations, and institutional features of technology systems will facilitate adjustments conducive to progress for women; and (e) building capacity of national partners is key to effecting change.

**The impact pathway begins with strategic foresight and ex ante analysis activities (Cluster 1.1)**, corresponding to the first half of the policy process spiral (Figure 1.0.3.1). In these steps the team: (a) involves scientists from participating CRPs and Centers; (b) engages stakeholders to identify key questions, develop scenarios, share results, and discuss implications; (c) builds strong relationships with the global modeling community; and (d) expands the ranks of the global modeling community through training. These activities enable policy researchers and analysts to move into the second half of the policy process spiral, where the information is shared and discussed with policy makers/advisors and decision makers in funding agencies, research institutes, and development organizations.

The foresight analyses have influenced actors in national innovation systems in setting investment priorities, pursuing policy reforms, and mobilizing resources. Team members present research results in many important fora, and are often invited to contribute to major works, such as the recent study of the future of the African drylands led by the World Bank (Cervigni and Morris 2016).

Prioritization of investments and reforms through Cluster 1.1 informs the work of **Cluster 1.2 on national innovation systems**. Pursuit of identified priorities requires changes in regulatory systems to encourage entrepreneurship and safeguard human and environmental health and increased capacity in agricultural research, extension, and education. The work of Cluster 1.2 is relevant to each of these. Work on science policy and innovation systems proceeds from identification of constraints to selection of instruments to engage with one or several policy processes. Outcomes are more conducive regulations, improved institutional arrangements, and better decisions on allocation of public spending to support innovation. These, in turn, contribute to SLOs and SDGs as shown in Figure 1.0.3.1. The Agricultural Science and Technology Indicators (ASTI) project works with national decision makers to benchmark their levels of investment in agricultural R&D relative to their goals and to other countries. The Program on Biosafety

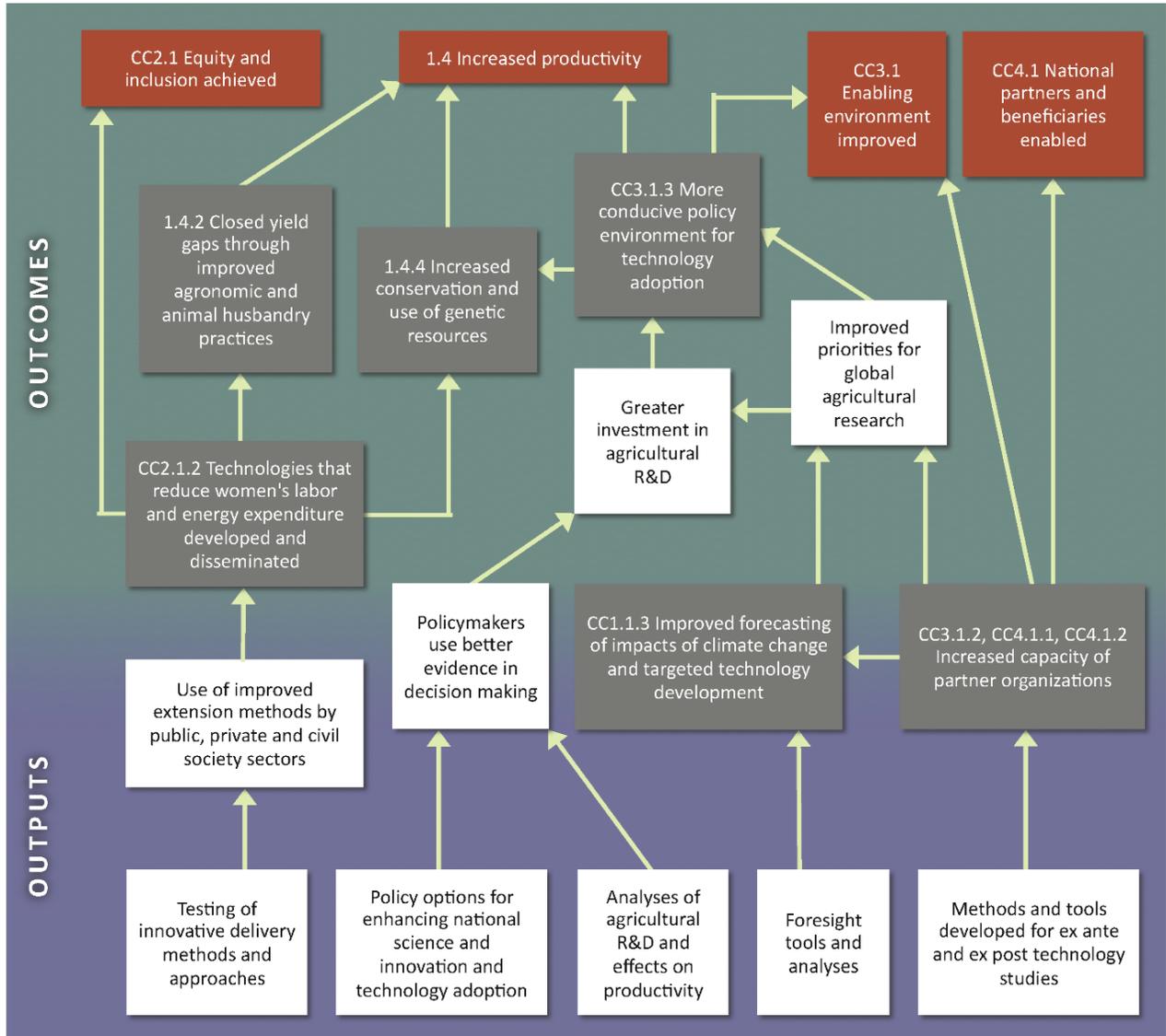
Systems (PBS) builds capacity and addresses knowledge gaps to accommodate safe introduction of modern biotechnologies. Research on institutional arrangements to support collaboration of the public and private sectors in agricultural technology assists national leaders to make the changes required to attract private investment in technology.

Cluster 1.2 provides decision makers with evidence on “what works” in the realm of delivery of solutions for sustainable intensification. Emphasis is placed on seed systems and information and advisory services, including attention to participation of women and young people. The PIM team has well-established relationships in these areas with APAARI, GFRAS, ASARECA, and CORAF, and is strengthening partnership with AGRA on seed systems. The research flows into applications to strengthen innovation systems and inform choices of farmers, thereby affecting poverty, food security, and natural resource use.

Flagship 1’s contribution to **youth employment** is indirect, and hence not shown in Figure 2.1.1.3.1. Technological stagnation is a major impediment to job creation for rural young people, both on and off the farm. Young people are not attracted to agriculture that has low returns and high risk, and uncompetitive agriculture does not generate jobs along the value chain. Faster growth in total factor productivity is essential for agriculture to deliver promising futures for rural young people in poor, agriculturally-dependent countries. Growth in total factor productivity, in turn, depends on well-functioning innovation systems, with adequate and well-targeted investment in agricultural science. PIM’s work in Flagships 1 and 2 is designed to bring the “youth” and “science” agendas together.

Two of the key risks noted in Section 1.0.3 are particularly important for this flagship. The first is the mismatch between evidence and policy makers’ objectives: policy makers often prefer short-term investments to long-term term ones such as agricultural research. PIM’s work on the political economy of funding for agricultural research will seek new approaches to addressing this chronic problem. A second risk is linked to perception that the research team is not objective, particularly in the areas of seed systems and biosafety. To counter this risk, the teams pay attention to understanding stakeholder views, strengthening their own technical capacity, and communicating about their activities in a transparent way.

**Figure 2.1.1.3.1: Impact pathways for Flagship 1**



### 2.1.1.4 Science quality

The Flagship 1 team consists of recognized leaders in conceptual and applied research related to design of foresight models; development of tools and methods for the rigorous study of technology adoption; and mixed qualitative and quantitative approaches to generating policy recommendations.

PIM's ability to deliver high-quality science in this flagship stems from (a) use of the **International Model for Policy Analysis of Agricultural Commodities and Trade (IMPACT)** modeling suite; (b) past investment under the **Agricultural Science and Technology Indicators (ASTI)** initiative, which is recognized as the leading repository of data and analysis on investment in agricultural research for development and a

global platform for communications and outreach on these issues; <sup>7</sup> (c) past investment under the **HarvestChoice**<sup>8</sup> project to provide strategic guidance for decision making on technological solutions for developing-country agriculture using spatially explicit ex ante analysis at the level of landscapes; (d) strong expertise at IFPRI, Bioversity International, and other Centers on **agricultural science policy, including genetic resources policy, intellectual property rights, seed systems, biotechnology, and biosafety**; (e) a significant body of empirical work on the evaluation of **agricultural extension and rural advisory services**; (f) past investment in the development of methods to assess demand for and adoption of agricultural technologies and practices, improve or refine technology targeting programs and projects, and evaluate the social and economic impact of technology adoption; (g) strong collaborations with CGIAR Centers and other CRPs on foresight modeling through a **community of practice**, with significant investment in capacity development; and (h) long-standing partnerships, networks, and linkages with partners. Efforts to strengthen research, communications, partnerships, and learning associated with this flagship will continue into Phase 2.

**At least one senior researcher from each of the 15 Centers** will be involved in the work of **Cluster 1.1**. Science quality in this cluster will also be ensured through continued **active engagement in the Agricultural Model Intercomparison and Improvement Project (AgMIP)**, which is the leading global network of biophysical and economic modelers focused on agriculture. IFPRI's IMPACT team co-leads AgMIP's Global Economics Team, collaborating with experts from Wageningen University and Research Centre (WUR), the Potsdam Institute for Climate Impact Research (PIK), Purdue University, the International Institute for Applied Systems Analysis (IIASA), and other leading modeling groups to ensure that the methods used remain state-of-the-art.

Significant advancements were made on foresight modeling tools and the production of highly impactful empirical studies in Phase 1. Through the community of practice, more than six crop models were improved, as were livestock, groundwater and land use components. The team produced a special journal issue on modeling climate change effects on agriculture ([Modeling climate change impacts on agriculture](#)), on examining the potential effects of “new” crops to adapt to climate change ([Adapting crops to climate change](#)) and on estimating the potential for several promising technologies to meet wheat, maize and rice demand some 30 years in the future ([Food under Resource Scarcity](#)).

In **Cluster 1.2**, science quality will be assured through continued involvement of senior scientists from CGIAR and external organizations. The team will further develop a nascent CGIAR **community of practice on technology adoption, in collaboration with SPIA's Strengthening Impact Assessment in the CGIAR (SIAC) program** and through increased collaboration with Michigan State University and partners. An objective of this community will be to develop improved methods for ex ante and ex post technology assessment. The community of practice and the cluster as a whole will explore a range of methods to advance the rigor and quality of findings, building on work that began in Phase 1. Various methods for institutional analysis of science policy and innovation systems (for example, ex ante economic surplus estimations and simulation models to examine potential impacts of policy on technological change; cross-

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<sup>7</sup> The Agricultural Science and Technology Indicators (ASTI) provides trusted open-source data on agricultural research systems across the developing world. Led by IFPRI, ASTI works with a large network of national collaborators to collect, compile, and disseminate information on financial, human, and institutional resources at both country and regional levels across government, higher education, nonprofit, and (where possible) private for-profit agricultural research agencies. See <http://www.asti.cgiar.org/>.

<sup>8</sup> HarvestChoice creates decision tools to increase the profitability of farming in Africa south of the Sahara. See <http://harvestchoice.org/>.

country case studies and mapping tools to examine outcomes, networks, powers, and impact; and innovation systems analyses to identify opportunities and challenges in science) will be explored. Similarly, various methods for the study of technology adoption will be used (for example randomized controlled trials, propensity score matching, and instrumental variable strategies for impact evaluation; incentive-compatible willingness-to-pay elicitation, discrete choice experiments, and other field experiments to gauge demand; and social network analysis and qualitative case studies at the community- and household-levels for in-depth insights). PIM's work on these topics will complement studies on the determinants of adoption in other CRPs, and add value by addressing elements of the policy and institutional context that influence uptake of new technologies – for example, seed regulations, ICT-enabled extension and targeted subsidies, microfinance services and contract farming arrangements (with Flagship 3), or index insurance (with Flagship 4).

In Phase 1, significant studies were conducted on the [state of agricultural R&D in Africa](#), on [increasing female participation in agricultural technology science](#), and on [agricultural intensification in Africa](#)). A collection of analyses on rural advisory services, including public extension systems and private extension efforts, and analyses of innovative extension approaches contributed to greater learning and dissemination of results to the policy and development communities, e.g. through the Global Forum for Rural Advisory Services [Good Practice Notes](#)).

Work initiated in Phase 1 to understand **how agricultural science contributes to growth in total factor productivity** will be continued, drawing on the detailed data available through the ASTI program. The work will link data on investment in science with observations on institutional and organizational dimensions of national innovation systems and estimation of growth in total factor productivity. The objective is to understand the causal links between science and productivity in order to strengthen these links and achieve higher returns to investment in science.

### ***2.1.1.5 Lessons learnt and unintended consequences***

One of the main objectives of the foresight modeling suite is to clarify interactions of technology, the environment, and human behavior that can lead to unintended consequences, so as to steer decisions toward increased likelihood that intended consequences will be realized. Avoiding undesirable consequences is at the heart of scenario analysis. Discussions within the foresight modeling team during Phase 1 revealed the many options that can be built into scenarios, and **the need to work closely as a team – and with other partners and stakeholders – to develop transparent and credible mechanisms to define the scenarios chosen for analysis**. Work is also needed to address “upstream” gaps in ability to model the impacts of complex production systems, biotic stresses, and extreme events, as well as “downstream” gaps in ability to model impacts on poverty, gender, nutrition, health, water quality, biodiversity, and other social and environmental indicators.

With regards to Cluster 1.1, Phase 1 showed that a fine-resolution focus on specific virtual technologies is well-suited for some questions (e.g. Center-specific comparison of different crop varieties in different agroclimatic regions), but not for higher-level prioritization. The focus on specific virtual technologies will continue in Phase 2, and is an excellent candidate for demand-driven co-investment by other CRPs with methodological support by PIM; however it will receive less emphasis than in Phase 1. Another analysis (Rosegrant et al. 2014) showed that **individual technological improvements are unlikely to have a significant global effect on production of major staple foods; combining well-performing crops and NRM practices along with agronomic practices shows much more potential**. This points to the need for better

understanding of how multiple technologies can best be combined in systems approaches, disseminated, and assessed, which will be addressed in Phase 2. Efforts in Phase 1 to develop indicators of biodiversity suitable for inclusion in the modeling suite were not successful. This work will not be pursued in Phase 2, and indicators from work outside CGIAR will be incorporated instead.

Work of Cluster 1.2 during Phase 1 leads to a conclusion that **levels of public investment in agricultural extension and advisory systems in developing countries remain low**, and that national leaders are unsure as to whether and how to invest in these areas. **Traditional extension systems are performing poorly**, and particularly fail to serve women adequately. No alternative extension model appears to be generally superior, although many alternative approaches work well under specific circumstances. Work on extension and advisory services during Phase 1 yielded some useful insights, but research questions must be sharpened and better informed by political economy analysis of how to achieve change.

PIM's work on adoption of technology during Phase 1 confirmed findings of other investigators that **data on actual use of technology in developing countries is inadequate to support rigorous studies of adoption** (Walker et al. 2014). Rates of return to investments in technology depend on accurate data on how fast and far the technology diffuses. The reasons for poor data are many, but the problem must be solved if a credible case is to be made for increased investment in agricultural research. The importance of the topic justifies the need for increased investment in novel tools and methods to track and analyze technology delivery and adoption. PIM will work with other CRPs and Centers, and in partnership with regional and national partners, to develop new approaches.

During Phase 1 PIM made a significant investment in a data platform for mapping the activities of CGIAR. The platform was not populated or used, and will not be further developed during Phase 2.

### **2.1.1.6 Clusters of activity (CoA)**

This flagship consists of two main clusters: Cluster 1.1 on **Foresight Modeling**; and Cluster 1.2 on **Science Policy and Innovation Systems for Sustainable Intensification**. The work under foresight covers ex ante analyses for priority setting of technology research; the work on science policy addresses the policy and operational constraints to diffusion of technology. They complement each other, and are designed to be supportive of research in other CRPs. Each of the two clusters is described in more details below.

#### *Cluster 1.1 – Foresight Modeling*

This cluster develops and applies improved foresight modeling tools and interpretive capacity to ex ante assessment of alternative agricultural technologies, policies, and investments. The constructed scenarios take into account climate change and other challenges in order to inform priorities for research and for promotion of technology adoption. The results of the alternative scenarios are assessed for impacts on prices, food security, nutrition and health, and natural resources, including potential trade-offs. Insights gleaned from this analysis inform decision making on selection of technologies for development within CGIAR and NARS, and can signal policy reforms that will be needed to complement development and release of new technologies. Foresight modeling is based on four main elements:

- **Engagement with decision makers** at Center, CRP, national and regional levels to identify key questions, develop scenarios, share results, and discuss implications.
- **Selective model development** with relevant partners, as needed to address key questions identified in consultation with decision makers. Core tools include the IMPACT modeling suite

(Robinson et al. 2015b) and related biophysical and water models, as well as links to computable general equilibrium (CGE) models and other socioeconomic and biophysical models.

- **Capacity strengthening** (see Section 2.1.1.10), to continue building a wide community of practice for quantitative foresight modeling, focusing on regional and national partners. Efforts to make the tools user-friendly to expand outreach will continue.
- **Scenario analysis**, both qualitative and quantitative, at appropriate spatial and temporal scales. Efforts to quantify impacts of investments on SLOs, IDOs, and Sub-IDOs will be advanced, as will application of the tools to decision making at the national and regional levels (for example to inform national investment strategies to address climate change, and prioritization of scientific effort under the Science Agenda for Agriculture in Africa).

This cluster extends prior analysis conducted under the auspices of PIM by IFPRI and partners as part of the Global Futures and Strategic Foresight program. For example, IWMI found that 44 percent of global irrigated food production is derived from groundwater, and 6-7 percent from depleting aquifers (Villholth et al. 2015). CIMMYT found that climate change could reduce maize yields in Africa south of the Sahara by 12 percent in 2050 (Tesfaye et al. 2015, Gbegbelegbe et al. 2014). CIAT, CIP, ICARDA and ICRISAT found that drought- and heat-tolerant varieties have the potential of offset (to varying degrees in different regions) the effects of climate change on yields of beans, potatoes, wheat, and groundnuts (Scott and Kleinwechter 2015; Kleinwechter et al. 2015; ICARDA 2014; Singh et al. 2014; Kadiyala et al. 2015; Robinson et al. 2015a). IRRI found that C4 rice has the potential to increase yields by half in Bangladesh and Thailand (Murty et al. 2015). IITA and ILRI explored key innovations and methodological improvements for their mandate crops and livestock, respectively (Abdoulaye et al. 2014, 2015; Alene et al. 2014; Creamer et al. 2014; Msangi et al. 2014).

Building on these prior analyses, activities planned in Phase 2 include **improvements in methodology for the analysis of multi-crop and crop-livestock production systems, climate-smart technologies and practices, and upstream drivers such as changes in the nature and magnitude of plant and animal pests and diseases, and climate variability**. Work in this cluster will also enhance modeling of agricultural technology trends and innovations in farming practices to better understand the impacts of these drivers on employment, income, poverty, food security, dietary diversity, nutrition and health (disaggregated by gender and age when possible), as well as environmental outcomes (land use, soil quality, greenhouse gas emissions, carbon stocks, water quantity and quality, and biodiversity). The new and more comprehensive analysis will compare outcomes under alternative socioeconomic, climate, technology, and policy scenarios.

To achieve these enhancements, **the IMPACT multi-market partial equilibrium model will be linked with a global computable general equilibrium (CGE) model** that will support general equilibrium analysis of feedback effects between agriculture and the rest of the economy, allowing consideration of indirect production and demand links, and impacts on employment. The global general equilibrium model captures the impact of growth in agricultural productivity on average household income and consumer prices, which can then be linked to changes in poverty. The IMPACT-CGE linkage will also provide the capability of assessing a wider range of economic policies, including carbon and energy taxes, sectoral investment levels, and trade policies. In addition, improved modeling of land use will allow better estimation of GHG emissions, biodiversity, and soil quality under different scenarios. Improved measurement of nutrients will allow better analysis of dietary diversity (with links to health).

More detailed development and application of IMPACT and related models at country and regional levels in close collaboration with local partners will inform deeper national policy dialogue. For example, the

scenarios developed by the foresight team will help inform the research priorities of African national and regional research bodies as they scale up investment to meet the challenges of the decades ahead.

**Close collaboration with most other CRPs will translate into joint support to enhancements of the common underlying modeling framework and global analyses. Each Center will lead foresight analyses focusing on their particular mandate systems and thematic areas, using common methodologies across Centers and CRPs, and sharing results.**

**Specific outputs of Cluster 1.1 are:**

- Updating of databases to perform foresight analyses.
- Upgrading of models and tools, with specific focus on linking food production estimates to nutritional outcomes and to environmental impacts building upon water modules and land use modules, linking results to poverty data through use of general equilibrium models, and identifying gendered effects through linking to micro-level datasets in specific countries.
- Ex ante empirical analyses applying the suite of tools to global, regional and national levels.
- Enhanced capacity in foresight modeling throughout CGIAR and among regional and national research institutes.
- Annual Strategic Foresight Report, with themes that will vary from year to year, drawing on the above and other specific analyses.

#### *Cluster 1.2 – Science Policy and Innovation Systems for Sustainable Intensification*

This cluster focuses on two broad areas of activity where policies, institutions, and markets matter most: (a) upstream, where agricultural R&D generates new solutions for agriculture, and (b) downstream, where the delivery, exchange, and use of these solutions translates into outcomes. The cluster draws on a growing body of work initiated as part of PIM in Phase 1, that examined issues of importance to CGIAR, such as the role of intellectual property rights in global crop improvement (Spielman and Ma 2015), the capacity of national innovation systems (Mekonnen et al. 2015), the dynamics of technology adoption (Magnan et al. 2015; Ward et al. 2014), and pathways toward agricultural intensification (Nin-Pratt 2015).

Activities on upstream science policy issues will focus on analysis of the levels, trends, and determinants of investment in agricultural R&D, and the public policies and incentive mechanisms that can encourage more effective and inclusive R&D investment decisions. Priority areas include (a) **investment analysis of agricultural R&D levels, trends, and determinants**, building on the ongoing work under the **ASTI initiative**; (b) **capacity strengthening on biotechnology and biosafety decision making under the Program for Biosafety Systems (PBS)**;<sup>9</sup> (c) strategic guidance for decision making on technology solutions using spatially explicit landscape-level ex ante analytical tools drawing on work of **HarvestChoice** and **BioSight**;<sup>10</sup> and (d) **cross-country analysis of key issues relating to genetic resources**, including use, exchange, conservation, and protection of intellectual property. ASTI data on scientists employed within the NARS at various levels are age- and sex-disaggregated, and thus amenable to analysis of issues related to gender and youth.

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<sup>9</sup> The Program for Biosafety Systems (PBS) supports partner countries in Africa and Asia in the responsible development and use of biotechnology. Managed by IFPRI, PBS works with countries interested in using biotechnology to enhance agricultural innovation. See <http://pbs.ifpri.info/>.

<sup>10</sup> The objective of the BioSight project is to address the complex trade-offs of sustainable intensification by combining biophysical and economic analysis. See <https://www.ifpri.org/project/biosight>.

Activities on downstream technology delivery issues will investigate rates of technological change at the farm and household levels in many developing countries. Emphasis will be placed on collaboration with other CRPs to address seed systems and markets, and agricultural extension and rural advisory systems. Additional activities will support introduction of better tools for targeting release of innovations and tracking adoption and associated impacts. A **CGIAR community of practice**<sup>11</sup> formed around these issues will facilitate sharing of information and collaboration.

The flagship's activities will assist policy makers **to determine appropriate levels of investment in agricultural R&D**, which in most cases, particularly in Africa south of the Sahara, will be higher than present levels. The work through ASTI, PBS, and HarvestChoice, and of Bioversity International and other CRPs and Centers will be relevant to this purpose. Activities will include: (a) in-depth analyses of the underlying trends and issues related to agricultural R&D capacity and investments, including the linkages between agricultural research investments and productivity change, (b) exploration of the political economy determinants of policy making on agricultural R&D expenditures (jointly with the political economy team of Flagship 2), (c) development of a virtual information platform to support the African Agricultural Technology Platform and the Science Agenda for Agriculture in Africa, and (d) assessment of the impacts of changes in the global policy landscape governing the conservation, exchange, and use of genetic resources for food and agriculture, particularly for national research systems, in collaboration with the proposed Genebanks Platform.

The flagship's activities will strengthen **seed systems** by assessing appropriate and effective roles for public, private, and community actors in varietal development and the production and distribution of seed and planting materials. These activities will specifically focus on identifying key policies and regulations that influence seed system performance and growth at various levels (national, regional, and global; community and market; crop, trait, and technology); analyzing the impact of alternative policies and regulations on key indicators (e.g., costs of development and delivery; access and availability); and recommending policy and regulatory changes and reforms to strengthen breeding programs and seed systems. Initial activities will include collaboration with DCL, and with RTB will focus on clonally/vegetatively propagated crops, for which major policy, investment, and regulatory challenges in multiplication and dissemination of high quality material exist and on which relatively little research is taking place. This will complement and build on some regional policy reforms ushered through by COMESA and ASARECA in the case of eastern and southern Africa. This work will link closely to PIM's Flagship 3.

The cluster will also continue work on **pluralistic rural extension and advisory systems**. Initial work will focus on evaluation of information and communications technology (ICT) innovations to support wider dissemination of technology (e.g. Digital Green in Ethiopia and Ghana); interventions that facilitate information flows to women and other underserved populations (for example, interventions to stimulate sustainable intensification of agriculture in ultra-poor areas with World Vision International); and experiments that gauge the understanding of demand for different types of technologies among different types of farmers (e.g. willingness to pay for new technology products). Efforts will be made to move beyond evaluation of individual programs and pilots to understanding how elements of pluralistic systems can be combined with inputs from the public, private, and NGO sectors to advise farmers on new technical options, and leverage farmer feedback to steer investments in science, technology, and innovation.

**Specific outputs of Cluster 1.2** are:

- Updated and expanded data and analysis on agricultural R&D.

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<sup>11</sup> This community of practice will include SPIA focal points and members of the CGIAR MEL CoP.

- Updated information on rates of change in productivity and implications for priority policy, institutional and technology responses.
- Recommendations on policy and regulatory reforms to support use, exchange and conservation of genetic resources, and release and distribution of improved cultivars with an initial emphasis on clonally or vegetatively propagated crops.
- Rigorous evidence on how to deliver services to support farmers' decisions with a focus on women and the youth.
- Better tools and methods to track adoption and impact of technologies.

These outputs will be used by agricultural ministries and research systems, including national genebanks and plant breeding programs; global, regional, and national research and extension associations, forums, hubs, and networks; global networks (CGIAR, GFAR); industry associations, such as the National Seed Association of India; private firms, such as Pioneer/Dupont, Advanta in India, and Western Seed Company in Kenya; farmer associations and civil society organizations; and donors (traditional supporters of science, technology and innovation (STI) policy research such as the World Bank, USAID, DFID, the European Commission, and the Bill & Melinda Gates Foundation, as well as newer donors and philanthropists) to advocate for increased and more strategic public and private spending on agricultural research.

### **2.1.1.7 Partnerships**

PIM's **comparative advantage** derives from the technical competence of the team, the relevance of the work to the CGIAR portfolio, and the unique contribution that Flagship 1 provides (Table 1.0.8.1). The expertise of the IMPACT and science policy teams is recognized. The foresight modeling team works regularly with other modelers through the AgMIP project, and provides to that effort a unique depth at the juncture of social, biological, and climate sciences. The analysis of agricultural R&D trends within the Agricultural Science and Technology Indicators project is unrivaled in coverage and use. The University of Minnesota is another provider of such data and analysis, but does not have the links with developing-country research organizations available to ASTI through CGIAR partnerships.

For **Cluster 1.1**, PIM has developed a community of practice that includes all Centers, and with links across all CRPs. Key partners for Cluster 1.1 are as follows:

- Members of the AgMIP Global Economics team (including the European Commission's Joint Research Center, FAO, IIASA, PIK, Purdue University's Global Trade Analysis Project, WUR, and others) collaborate in multi-model analysis of reference scenarios.
- The University of Florida assists with crop model development and analysis.
- Oxford University addresses health impacts of changes in food availability and diets.
- Regional and national partners collaborate in scenario development and analysis, in most cases via individual Centers, as follows: AfricaRice (ECOWAS, UNECA, West African Economic and Monetary Union); CIAT (Fondo Latinoamericano para Arroz de Riego, IDB); CIFOR (CIRAD, Stockholm Environment Institute); CIMMYT (ASARECA, CORAF, various NARS in Africa, University of Minnesota, University of Florida, WUR); CIP (Instituto Nacional de Innovación Agraria Peru; Interamerican Institute for Cooperation in Agriculture, Learning Alliance in Latin America and the Caribbean); ICARDA (Tunisia Ministry of Agriculture, Tunisia's National Institute of Agronomic Research); ICRISAT (Ethiopian Institute of Agricultural Research, Indian Council on Agricultural Research); IITA (Bayero University of Kano, Nigeria); ILRI (Africa Union Commission, universities and research institutions in Tanzania, Uganda and Vietnam); IRRI (Association of Southeast Asian Nations Climate Resilient Network, FAO, GIZ, Regional Multi-Hazard Early Warning System for Asia

and Africa); IWMI (various partners via its regional offices); and WorldFish (national partners in Bangladesh and Vietnam).

- The Center for Integrated Modeling of Sustainable Agriculture and Nutrition Security will bring expertise on nutritional indicators and impacts of changes in food availability and diets.
- The potential for new linkages with private-sector actors is being explored, by building on previous work with CropLife International on the impact of new agricultural technologies and with Lloyds on the impacts of extreme events.

For **Cluster 1.2**, key partners within CGIAR are DCL, MAIZE, RICE, RTB, and WHEAT, as well as the Genebanks Platform. Other key research partners include Cornell University, MSU, SPIA, UC Davis, and WUR. The cluster will work closely with NARS and subregional organizations on issues related to science, technology, and innovation policy, including the ASTI program's efforts to collect and analyze internationally comparable data on agricultural R&D, and design and implementation of policies related to genetic resources, biosafety, intellectual property rights, and integrated seed systems. Implementation partners include APAARI, ASARECA, CORAF, FARA, IICA, and the GFRAS regional networks. The flagship will expand its partnerships with private entities, such as CropLife International and local seed trade associations. Relationships with development partners and regional organizations such as the Africa Union, AGRA, Digital Green, FAO, GFRAS, IFAD, the Integrated Seed Sector Development (ISSD) program in Africa, and World Vision International will continue.

### **2.1.1.8 Climate change**

Given the explicit way in which weather is quantitatively linked to crop productivity, much of the analytical work carried out by PIM in this flagship is relevant to the analysis of climate impacts on agriculture. The IMPACT model is linked to crop and water models that in turn use results from General Circulation Models (GCMs) **to project the impact of climate change on crop yields, harvested area, production, consumption, prices, and trade of more than 60 agricultural commodities**. For example, findings from Phase 1 indicate that climate change without adequate adaptation could nearly double projected increases in global prices and area for major crops by 2050, with potentially significant implications for food security and the environment (Wiebe et al. 2015). **Analysis of the potential for innovative technologies, policies, and investments to reduce adverse impacts of climate change is included in Flagship 1.**

The agronomic modeling components of the HarvestChoice and BioSight projects take into account the impact of precipitation on yields, and can show the impact of a change in climatic conditions towards a wetter or drier regime on yields and on the natural resource base. The linkage to household-level welfare outcomes provides an important means to investigate how household decisions can lead to trade-offs between socioeconomic and environmental outcomes. An effort is underway to harmonize key indicators to assess the environmental and socioeconomic impacts of sustainable intensification-focused interventions –through both AfricaRISING (the USAID-funded program on sustainable intensification) and other research efforts (for example, the VitalSigns project of Columbia University). These interventions overlap strongly with climate-smart agricultural technologies and practices, and form a clear linkage between ongoing PIM activities such as BioSight and other efforts within CCAFS, FAO, and other global partners pertaining to climate change.

### **2.1.1.9 Gender**

A key question that this flagship will address is **how different population groups (men and women, rich and poor, youth and adult, urban and rural) are affected by the major long-term drivers of change facing agriculture and food security, and what technological innovations, policies, and investments can best address the differing needs of these groups**. The research takes into account (a) gender considerations in the selection of technologies, policies and investments for foresight analysis, and the potential for gender dynamics to influence drivers of change in agriculture and food systems, (b) links to other models (including country-level CGE models with household data, where sex-disaggregated data are available) to analyze impacts of selected scenarios on employment and other variables, (c) potential gender implications of the results of selected scenarios through links to existing gender-focused research, (d) a strong gender lens on the analysis of access and provision issues in agricultural extension systems, (e) gender dimensions of technology adoption trends, determinants, and impacts, particularly with respect to seed systems and markets, and (f) the role of men, women, and various age cohorts in the conduct of science in agricultural research organizations (Beintema 2014).

The capacity of the modeling suite to deliver rigorous results on the question of how different portfolios of research benefit women was not tested during Phase 1, since not all the needed elements were in place; this will be a topic on the agenda for Phase 2. The work on adoption of technology has a stronger foundation of gender analysis, and the emphasis during Phase 2 will be on comparative analysis across CRPs, with rigorous methodology and generalizable results. This work will be undertaken through the CGIAR Collaborative Platform for Gender Research (see Flagship 6).

### **2.1.1.10 Capacity development**

Capacity development has been a key part of Flagship 1 in Phase 1, and will be expanded further in Phase 2, focusing on elements 1, 2, 5, 6 and 8 of the CGIAR CapDev Framework.

In **Cluster 1.1**, capacity strengthening will take place in two broad thematic areas. First, IFPRI plans to provide at least two **training sessions each year on quantitative foresight modeling using the IMPACT system of models**. This training will be available to CGIAR Centers, to ensure they have access to the latest methods, tools and skills, and to national and regional partners. The IMPACT model itself will be made available to those who have completed the training and to others upon request. The second area consists of complementary **training by IFPRI and other Centers for national and regional partners on commodity-specific biophysical modeling tools**. Training of partners will facilitate collaboration on priority topics, and expand the capacity of partners to conduct foresight modeling independently in the future.

In **Cluster 1.2**, the **community of practice on tools and methods for the rigorous evaluation of technology adoption** will be expanded. This community will engage CRPs, Centers, and national partners looking to strengthen and extend their analytical toolkits. Capacity strengthening around science and innovation issues will be developed through collaborative research activities with key partners in developing countries, leveraging existing networks such as those managed by ASTI. Additional capacity strengthening efforts will focus on how national research systems, regulators, and policy advisors can make use of scientific evidence in decision making, for example on biosafety risk assessment (with support from the PBS capacity strengthening team), plant genetic resource management (with Bioversity International), and seed system regulation (with RTB and the Agrifood System CRPs).

### ***2.1.1.11 Intellectual asset and open access management***

In accordance with the CGIAR guidelines on intellectual asset and open access management, and with the policies of the lead Center and its partners, Flagship 1 will ensure access to its intellectual assets in a manner that encourages access, use, replication, and adaptation of its research while safeguarding the privacy of participants and protecting confidential and proprietary information. Flagship 1 produces an extensive array of data, code, and analysis, and maintains several online portals and interactive tools ([IMPACT webtool](#), [ASTI](#), [AgriTech toolbox](#), [HarvestChoice](#)...). The IMPACT model will be made available to those who have completed the training and to others upon request.

### ***2.1.1.12 FP management***

The Flagship 1 management team includes a **flagship leader, and leaders for each of the two clusters.**

**The role of flagship leaders will be expanded in Phase 2 relative to Phase 1**, especially with regards to coordinating inputs from the participants, reporting on flagship-level progress and budget execution, and tracking outcomes and impact. The flagship leader will serve on the PIM Management Committee. The flagship management team will be funded for one third of FTE for oversight of the flagship. PIM will also cover the cost of a flagship management support function (to help with formulation of annual work plans, tracking of deliverables, and reporting) up to 50% FTE by flagship.

The Phase 1 leader of Flagship 1 has led the preparation process for Phase 2. Flagship leaders for Phase 2 were selected in July, 2016 through a transparent merit-based process. The PIM Management Committee approved TORs for the positions and selection criteria including experience and excellence in the field (as measured through records of ISI publications and evidence of contribution to policy and other PIM outcomes), demonstrated ability to raise funds and attract strong research and implementation partners, and managerial experience. Staff from all Participating Centers and selected external partners were invited to nominate candidates. Self-nominations were allowed. A selection panel consisting of two SPAP members, one external partner, one representative of the Lead Center, and one representative of the PMU assigned scores to the nominees. As a result of this process, **Mark Rosegrant of IFPRI** was selected (CV in Annex 3.8). Cluster leaders will be chosen by September, 2016 through a participatory process led by the appointed flagship leader.

## 2.1.2 Flagship Budget Narrative

### 2.1.2.1 General information

CRP Name	Policies, Institutions, and Markets
CRP Lead Center	International Food Policy Research Institute
Flagship Name	Flagship 1: Technological Innovation and Sustainable Intensification
Center location of flagship leader	IFPRI

### 2.1.2.2 Summary

Total Flagship budget summary by sources of funding (USD)

Funding Needed	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Total
W1+W2	4,140,000	4,140,000	4,264,200	4,264,200	4,392,126	4,392,126	25,592,652
W3	7,858,882	7,858,882	8,094,649	8,094,649	8,337,488	8,337,488	48,582,040
Bilateral	10,300,088	10,300,088	10,609,090	10,609,090	10,927,363	10,927,363	63,673,085
Other Sources							0
	22,298,970	22,298,970	22,967,939	22,967,939	23,656,977	23,656,977	137,847,777

Funding Secured	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Total
W1+W2 (Assumed Secured)	4,140,000	4,140,000	4,264,200	4,264,200	4,392,126	4,392,126	25,592,652
W3	7,276,343	4,802,386	2,401,193	1,091,451	0	0	15,571,375
Bilateral	7,355,658	4,854,734	2,427,367	1,103,348	0	0	15,741,109
Other Sources							0
	18,772,001	13,797,120	9,092,760	6,458,999	4,392,126	4,392,126	56,905,136

Funding Gap	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Total
W1+W2 (Required from SO)	0	0	0	0	0	0	0
W3 (Required from FC Members)	-582,538	-3,056,495	-5,693,455	-7,003,197	-8,337,488	-8,337,488	-33,010,665
Bilateral (Fundraising)	-2,944,430	-5,445,353	-8,181,723	-9,505,742	-10,927,363	-10,927,363	-47,931,977
Other Sources (Fundraising)	0	0	0	0	0	0	0
	-3,526,969	-8,501,850	-13,875,179	-16,508,940	-19,264,852	-19,264,852	-80,942,642

## Total Flagship budget by Natural Classifications (USD)

	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Total
Personnel	7,790,740	7,790,741	8,024,463	8,024,463	8,265,197	8,265,196	48,160,803
Travel	1,492,135	1,492,135	1,536,899	1,536,899	1,583,006	1,583,006	9,224,086
Capital Equipment	0	0	0	0	0	0	0
Other Supplies and Services	5,605,940	5,605,940	5,774,118	5,774,118	5,947,342	5,947,342	34,654,803
CGIAR collaborations	0	0	0	0	0	0	0
Non CGIAR Collaborations	4,854,218	4,854,218	4,999,845	4,999,845	5,149,840	5,149,840	30,007,809
Indirect Cost	2,555,934	2,555,934	2,632,612	2,632,612	2,711,591	2,711,591	15,800,276
	22,298,967	22,298,968	22,967,937	22,967,937	23,656,976	23,656,975	137,847,777

## Total Flagship budget by participating partners (signed PPAs) (USD)

	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Total
IFPRI	15,602,971	15,602,970	16,071,059	16,071,059	16,553,192	16,553,192	96,454,445
Africa Rice	210,000	209,999	216,300	216,299	222,789	222,789	1,298,178
Biodiversity	546,000	545,999	562,380	562,380	579,251	579,250	3,375,263
CIAT	524,999	525,000	540,749	540,750	556,973	556,972	3,245,445
CIFOR	209,999	209,999	216,300	216,298	222,789	222,788	1,298,178
CIMMYT	419,999	419,999	432,600	432,600	445,578	445,578	2,596,355
CIP	839,999	839,999	865,200	865,199	891,156	891,155	5,192,712
ICARDA	336,000	336,000	346,080	346,080	356,462	356,461	2,077,085
ICRAF	1,050,000	1,050,000	1,081,499	1,081,499	1,113,945	1,113,945	6,490,890
ICRISAT	525,000	525,000	540,749	540,750	556,972	556,972	3,245,446
IITA	545,999	546,000	562,380	562,380	579,251	579,251	3,375,263
ILRI	419,999	420,000	432,599	432,600	445,578	445,578	2,596,357
IRRI	336,000	336,000	346,080	346,079	356,462	356,462	2,077,085
IWMI	336,000	336,000	346,080	346,079	356,462	356,462	2,077,085
WorldFish	335,999	335,999	346,079	346,079	356,462	356,462	2,077,084
MSU	29,999	30,000	30,899	30,900	31,827	31,826	185,453
WUR	29,999	30,000	30,899	30,899	31,827	31,827	185,453
	22,298,962	22,298,964	22,967,932	22,967,930	23,656,971	23,656,970	137,847,777

Explanations of these costs in relation to the planned 2022 outcomes

Flagship 1 includes work on foresight modeling, adoption of technology, science policy, seed systems, and investment in agricultural research. Flagship 1 has a **relatively large Window 1-2 allocation, reflecting its global foresight modeling agenda, demand from CGIAR, and participation of many partners**. While in the latest years of Phase 1 the foresight modeling effort was primarily funded by PIM (through W1-2 and a bilateral grant from the Bill & Melinda Gates Foundation), in Phase 2 the funding model for this work will shift to co-investment with the other CRPs: PIM will fund overall coordination and the maintenance of the modeling tools, while the AFS CRPs will fund applications specific to their mandates. This will give the work more visibility within CGIAR, and free up some PIM resources for other priorities. This change, and the distribution of the Flagship 1 funding across a large number of partners (all 15 CGIAR Centers + WUR and MSU), lead to relatively modest allocations by partner (other than IFPRI).

In Phase 1, temporary interruptions of spending have been observed in several Participating Centers due to personnel changes and delays in hiring. In such cases, discussions are held between the Program

Management Unit and the Participating Center to determine whether the flagship leader should be involved in the hiring process, whether the funding should be reallocated to other activities, etc. Other risks to spending mentioned in the program-level budget narrative apply to Flagship 1.

### 2.1.2.3 Additional explanations for certain accounting categories

**Benefits:** Benefit costs primarily include leave, health, and pension costs. The costs are pooled and allocated over a base consisting of total labor. The benefit pool divided by total labor creates the rate applied to labor. For most partners, the benefit rate used in this budget was the benefit rate for the Lead Center, i.e. 58.5%.

**Other supplies and services:** The “Supplies and services” category represents about 28% of the direct costs. This category includes field surveys; research support; cost-shared services for IT and other; workshops and training, including capacity development, meetings and conferences; editing and publications; miscellaneous charges such as copying and fax; a few partners also include benefits in this category.

### 2.1.2.4 Other sources of funding for this project

The large bilateral/W3 donors for Flagship 1 are **BMGF, USAID, and DFID**. In Phase 2, additional funding for the foresight work will be sought from IFAD, the Wellcome Trust, 3ie, regional development banks, regional economic communities, and national and private-sector sources (for specialized analyses).

### 2.1.2.5 Budgeted costs for certain key activities

	Estimate annual average cost (USD)	Please describe main key activities for the applicable categories below, as described in the guidance for full proposal
Gender	4,905,774	See below and flagship narrative
Youth (only for those who have relevant set of activities in this area)	2,229,897	See below and flagship narrative
Capacity development	4,459,794	See below and flagship narrative
Impact assessment	1,783,918	See below and flagship narrative
Intellectual asset management	0	See below and flagship narrative
Open access and data management	0	See below and flagship narrative
Communication	805,464	See below and flagship narrative

**Gender:** The gender component of Flagship 1 is derived by assigning a gender percentage to each of the Sub-IDOs that the flagship contributes to (see Table C of the Performance Indicators Matrix). For the Sub-IDOs under IDO CC2.1 on Equity and inclusion achieved, the gender percentage is assumed to be 100%. Using this methodology, the Flagship 1 **gender budget for 2017** is estimated at **\$4.9M**, which represents **22%** of the total flagship budget. Key gender activities in Flagship 1 are described in Section 2.1.1.9 of the Flagship 1 narrative.

**Youth:** For this flagship the level of intensity in addressing youth issues is estimated at **10%**, that is **\$2.2M in 2017**. The contribution of Flagship 1 to PIM’s youth strategy is described in Annex 3.5.

**Capacity development:** The capacity development component of Flagship 1 is derived by adding up the flagship contributions to the capacity development Sub-IDs, i.e. Sub-IDs CC3.1.2, CC4.1.1, and CC4.1.2 (see Table C of the Performance Indicators Matrix). It is assumed that the flagship's contributions towards other Sub-IDs do not count as capacity development. Using this methodology, the Flagship 1 **capacity development budget for 2017** is estimated at **\$4.5M**, which represents **20%** of the total Flagship 1 budget.

**Impact assessment:** The impact assessment budget is estimated to be **8%** of the flagship budget, for a total of **\$1.8M** in **2017**. Examples of activities counted in this budget are: use of foresight analysis for PIM's own ex ante assessment (Cluster 1.1); use of ASTI indicators on national investment in agricultural R&D to track PIM's own progress (Cluster 1.2).

**Open access and data management:** PIM is fully committed to complying with the CGIAR Open Access and Data Management (OADM) Policy and its Implementation Guidelines. Major infrastructures and staff required to do so are covered through overhead costs charged by the Centers, and include: maintenance of digital content collections; Online Public Access Catalog (OPAC)/library catalog systems; website development related to repositories; promotion and training in support of OA/OD. Additional costs specific to PIM research activities (essentially OA fees for journal articles) are budgeted for at project level under Supplies and Services.

**Intellectual asset management:** As explained in Annex 3.10, the budget for IA management is the same as the budget for OA management (see above).

**Communications:** As described in PIM's Communications Strategy, flagship leaders will appoint a staff member responsible for liaising with the Program Management Unit, participating in the PIM communicators group, and supporting the flagship's communications activities, which include: contributions to the PIM newsletter and blogs; organizing knowledge sharing and capacity building events on the topics of the flagship research; representing PIM at local/regional events; and supporting application of the PIM Branding and Acknowledgement Guidelines at flagship level. It is estimated that these tasks will represent 0.3 FTE of a Communications Specialist, or about \$25K annually per flagship. In addition, Supplies and services include communications-related items, among which publications and workshops; these items are estimated to represent 3.5% of the flagship budget i.e. \$780K in 2017. The total is **\$805K (3.6%** of the total Flagship 1 budget).

### **2.1.2.6 Other**

Please disregard the FTE allocations columns in the Excel budget template (the computation of this item is not appropriate for an aggregated presentation of the personnel costs). The approximate number of FTE (average across years) for this flagship is 34. See Annex 3.8 for the CVs of the core members of the flagship team.

The total time dedicated to the **flagship coordination activities** is estimated at about 30% FTE. Following the guidance in the case when this percentage is below 50%, the corresponding costs are included in the flagship budget. PIM will also cover the cost of a flagship management support function up to 50% FTE by flagship; the corresponding costs are included in the program management costs.

There are no plans to purchase capital equipment.

### 2.1.3 Flagship Uplift Budget

Outcome Description	Amount Needed	W1 + W2 (%)	W3 (%)	Bilateral (%)	Other (%)
Extended foresight models and results - encompassing a greater range of SRF outcomes - are used by 12 regional and national research organizations or government agencies in Africa, Asia and Latin America and global development organizations as inputs to their priority-setting (includes capacity development)	2,000,000	100	0	0	0
Studies on policies, regulations, and investment in support of agricultural science, technology, and innovation are used by key government entities in 1 additional CGIAR country of collaboration (includes capacity development)	2,500,000	100	0	0	0
Budget allocations for agricultural research exceed projections of the 2012-2016 trend in 1 additional CGIAR country of collaboration (includes capacity development)	2,000,000	100	0	0	0
In 1 additional CGIAR country of collaboration, adoption of selected promising technologies and management practices is 20% above counterfactual without supportive technology dissemination innovations and policies (includes capacity development)	2,500,000	100	0	0	0

## 2.2 Flagship 2: Economywide Factors Affecting Agricultural Growth and Rural Transformation

### 2.2.1 Flagship Project Narrative

#### 2.2.1.1 Rationale, scope

CGIAR creates global public goods, but achieves impact at national and local levels. The translation of globally relevant research findings into impact on the ground is mediated through decisions of millions of national and local actors subject to rules, constraints, and incentives specific to place and time. These actors operate in a context of **rural and structural transformation** (Timmer 1988, 2009). Rural transformation refers to the process through which rural incomes grow, rural economies diversify, and linkages with urban and peri-urban areas strengthen. Structural transformation refers to the process through which an economy initially dominated by agriculture experiences faster growth in the manufacturing and service sectors than in agriculture, and becomes less dependent on agricultural jobs and value addition over time.

Agriculture contributes to development through direct and indirect, or economywide, impacts. The indirect impacts are large, and associated with structural and rural transformation (Martin 2016). Economywide effects bring **changes in relative factor costs (i.e., land, labor, and capital), new patterns of consumption, and changes in opportunities for trade and specialization, all of which are relevant to the work of CGIAR.**

Most work of Flagship 2 is at the **national and subnational level**. Within PIM's conceptual framework shown in Figure 1.0.6.2, Flagship 2 contributes most directly to growth and inclusion.

Flagship 2 focuses on **three sets of research questions** (further elaborated in Section 2.2.1.6):

- What is the nature of **transformation in late-transforming countries** (that is, those undergoing the process in the 21<sup>st</sup> century), and what is the **role of agriculture**? How are **land and labor markets** transforming, and where are **jobs** created for rural young people? (Cluster 2.1)
- What levels and composition of **public spending** for agriculture contribute to growth and poverty reduction in late-transforming countries? How can budgets best be executed to deliver high quality goods and services to rural constituents? (Cluster 2.2)
- What are **political economy factors** that influence agricultural and rural outcomes in late-transforming countries? At what entry points in the policy process can evidence influence outcomes? (Cluster 2.3)

The first topic area (Cluster 2.1) is selected because national leaders need to understand the transformation process in order to identify feasible options for intervention for agriculture, for rural development and for the economy as a whole, and their likely consequences (Diao and McMillan 2015; McMillan, Rodrik, and Verduzco-Gallo 2014; McMillan and Harttgen 2015; Gollin, Jemi, and Vallrath 2016). The second topic (Cluster 2.2) is selected because decisions on public investment and expenditure are essential for the public sector to fulfill its required role in facilitating agricultural growth (Mogues, Fan, and Benin 2015). The third topic (Cluster 2.3) is selected because technically superior choices are often subject to political constraints. Understanding political processes can facilitate effective provision of evidence to actors championing constructive outcomes (Birner and Resnick 2010; Booth 2012; Resnick et al. 2015). **Flagship 2 works simultaneously on the nature of transformation and job creation (Cluster**

**2.1), the instruments to spur it (Cluster 2.2), and the political economy levers to influence it (Cluster 2.3).** The expansion of work on political economy is included at the recommendation of the ISPC and the PIM Science and Policy Advisory Panel.

Late-transforming countries face internal challenges in a context of external and global **grand challenges**. Among the latter are climate change, degradation of water, soil, forests, fish stocks, and biodiversity, urbanization without significant industrialization, high levels of youth unemployment, and increasing competition for land. **Many of these challenges are particularly acute in Africa south of the Sahara, where most late-transforming countries are located; therefore the work of Flagship 2 is primarily concentrated in this region, with emphasis on Ethiopia, Ghana, Malawi, Mozambique, Nigeria, Tanzania, and Uganda.** The work is well aligned with the Malabo Declaration, the articulation in 2014 by African Heads of State and Government of their new commitments to the CAADP agenda.

Studies of the experience of transformation in Asian and Latin American countries can be informative in understanding the African experience; **Vietnam**, a non-African CGIAR country of collaboration, offers particularly relevant insights. Subject to resource constraints, Vietnam will be included in the research effort. Issues of transformation and youth employment are also very important in the **Middle-East and North Africa**, and PIM's investment in Arab Spatial during Phase 1 positions the program to deepen work in this region in Phase 2. Flagship 2's research agenda reflects ongoing research demands received from governments in CGIAR countries of collaboration, often via IFPRI's Country Strategy Support Programs (CSSPs).

Flagship 2 **complements other PIM flagships**. For example, Flagship 2 situates Flagship 3's work on input and output markets within broader processes of transformation. The work on land and dynamics of farm size will be well coordinated with analysis of land tenure security in Flagship 5. Work on public expenditure and service delivery within Flagship 2 will be coordinated with that on extension and advisory services in Flagship 1. Analysis of public spending decisions in Flagship 2 will be coordinated with work on fiscal implications of social protection programs in Flagship 4. Work on gender dimensions of transformation is done jointly with Flagship 6. The Flagship 2 team also works collaboratively with other CRPs. The social accounting matrices and computable general equilibrium models updated for the CGIAR countries of collaboration **allow AFS CRPs to explore the economywide impacts of their innovations**. Joint work with WLE during Phase 2 will explore the complementary roles of urban, peri-urban and rural agriculture in feeding growing cities.

### **2.2.1.2 Objectives and targets**

Flagship 2 contributes primarily to the IDOs on Increased incomes and employment (1.3), Equity and inclusion achieved (CC2.1), Enabling environment improved (CC3.1), and National partners and beneficiaries enabled (CC4.1). Through these IDOs, and indirect effects of an enabling policy environment on other IDOs – for example Increased productivity (1.4) and Increased resilience of the poor to climate change and other shocks (1.1), Flagship 2 contributes to SLO1 on Reduced poverty, as well as to the three cross-cutting themes: Gender and youth (CC2), Policies and institutions (CC3), and Capacity development (CC4). The Sub-IDOs to which Flagship 1 contributes most are listed in Table 2.2.1.2.1.

Work on income growth and employment will clarify the process of rural job creation in late-transforming countries. The focus on youth employment links IDOs 1.3 and CC2 together. Public investments in agricultural research, rural infrastructure, land administration, water management, and other areas underpin more dynamic agriculture and job creation both on and off farms, with commensurate

opportunities for women of all ages and young men. Although Flagship 2 does not directly examine input markets – which are addressed in Flagships 1 (seeds) and 3 (fertilizer), creation of an enabling rural environment conducive to agricultural growth includes investments and reforms that make purchased inputs more affordable and efficiently used. **The effort to understand rural transformation aims at identifying levers to accelerate it and make it more inclusive, thereby contributing to multiple IDOs and Sub-IDOs.**

**Table 2.2.1.2.1: Contributions of Flagship 2 to the CGIAR Sub-IDOs**

Sub-IDOs	Relative contribution (%)
1.3.2 Increased livelihood opportunities	20
1.3.4 More efficient use of inputs	10
CC2.1.1 Gender-equitable control of productive assets and resources	15
CC2.1.3 Improved capacity of women and young people to participate in decision-making	5
CC3.1.2 Increased capacity of partner organizations, as evidenced by rates of investment in agricultural research	5
CC3.1.3 Conducive agricultural policy environment	30
CC4.1.1 Enhanced institutional capacity of partner research organizations	5
CC4.1.2 Enhanced individual capacity in partner research organizations through training and exchange	10
Total	100

Flagship 2's work on factor markets and rural transformation contributes to an understanding of growth in productivity. Higher farm profits and expansion of towns and cities put pressure on land prices and existing tenure arrangements. How farm size adjusts, and who is able to acquire increasingly valuable land, has major bearing on the inclusiveness of rural change, and on the technologies and management practices that will be in demand. Whether real rural wages are rising or falling affects demand for mechanization and institutional arrangements to supply it. When rural households can pursue mixed livelihoods through off-farm earnings, they have cash to purchase inputs and buy equipment that would be out of their reach if they relied on credit. **These changes in factor markets create heterogeneous landscapes for adoption of new technologies and management practices.** Understanding of the changing economic context in which farmers make decisions can help researchers and advisors better target development and release of new technologies and management practices, thereby contributing to growth in productivity. Most countries where PIM works have their own targets set for agricultural growth, productivity, and reduction of rural poverty through **commitments to CAADP and national development plans.** By assisting countries to track whether they are likely to meet their own targets, and identifying policy and investment options to help them meet these targets, PIM contributes to attainment of CGIAR's SLOs and IDOs.

Work on **gender and youth** includes the focus on youth employment, gender dimensions of migration and nonfarm employment, and the differential benefits for men and women of alternative streams of public investment. The intent of this research is to identify levers of intervention that will increase the inclusiveness of the transformation process.

Much of the work of Flagship 2 is relevant to change in the enabling environment, especially the body of work on political economy of the policy process (Cluster 2.3). The research team selects policy issues that are particularly important to the transformation process and/or to the performance of AFS CRPs in a given country, and examines the scope to influence outcomes through timely and well-placed provision of evidence showing the implications of policy options under consideration.

**Capacity development** is an integral element of all of the Flagship 2 clusters. The work is undertaken **with national and local counterparts as research partners, and in response to expressed demand from stakeholders**. The **IFPRI Country Strategy Support Programs** are designed on these principles, and are major vehicles of support for engagement within this flagship. Flagship 2's primary non-CGIAR research partners – Michigan State University and Cornell University – have long-standing relationships with national counterparts. Relationships of trust and shared work programs build capacity of counterparts.

**Specific outcomes of Flagship 2** are:

- **Use of evidence from research on the economywide factors affecting rural transformation by decision makers in policy processes.** It is expected that in 2022 governments in three CGIAR countries of collaboration will use tools and evidence on the economywide factors affecting rural transformation to develop policies that are better targeted towards raising agricultural growth and rural incomes.
- **Use of evidence from research in decisions on public expenditure for agriculture.** It is expected that in 2022 governments in three CGIAR countries of collaboration will use empirical evidence and quantitative methods to modify their allocation of public resource towards better targeted investments favoring inclusive agricultural growth and rural transformation.
- **Increased agricultural growth and rural incomes.** It is expected that in 2022 agricultural growth and rural incomes will be increased (above counterfactual trend) in three CGIAR countries of collaboration implementing evidence-based policies and/or public expenditure allocations, through the outcomes above and the contribution of other flagships.

Due to the diversity of national contexts, more specific outcomes for the flagship are to be defined at country level.

### ***2.2.1.3 Impact pathway and theory of change (for each individual FP)***

Flagship 2's theory of change is based on the following **assumptions**: (a) Policy choices can affect the pace and outcomes of rural and structural transformation; (b) Among the most important outcomes are those related to inclusion, and especially to creation of jobs for young people and opportunities for gainful employment for women and members of marginalized groups; (c) Decisions on public spending are among the key levers for the public sector to influence transformation; (d) Interest groups and champions for inclusion exist within national polities; (e) Knowledge of the policy process and political economy can reveal entry points at which evidence can assist advocates for inclusive growth. These assumptions are tested in the course of assessing the policy process and opportunities to intervene, as presented in Figure 1.0.3.1. Figure 2.2.1.3.1 is a representation specific to Flagship 2 of detail underlying the flow of the policy process and PIM's engagement with it shown in Figure 1.0.3.1.

Most work of Flagship 2 takes place **at the national level in partnership with national stakeholders and counterparts** in research organizations, civil society organizations, farmers' groups, government, and the media. IFPRI's CSSPs in Ethiopia, Ghana, Malawi, Nigeria, and Uganda are of great assistance through their

constant presence and policy dialogue. The Flagship 2 research partners have similar programs in Mozambique and Tanzania. The impact of PIM's research may be directly through national groups; alternatively, impact can be achieved by informing or influencing other CRPs and outside parties that also have weight in the policy process. Examples of the latter are development partners such as the World Bank, IFAD, regional development banks, FAO, bilateral agencies, and regional organizations.

Part of the work in Flagship 2 is **at the global level to examine cross-country experience**. Global discourse can influence the understanding of national leaders, and shift their thinking. Many national leaders (particularly in ministries of finance) expect labor-intensive modern manufacturing to carry their countries into middle-income status. Cross-country analysis of late transforming countries, however, presents a different set of stylized facts for transformation in the 21<sup>st</sup> century. Evidence showing how the present context differs from earlier eras can help national leaders recognize the need for new approaches. Cases of "positive deviance" (where countries achieved success despite challenging circumstances) also provide important insights and lessons. For example, Ethiopia and Ghana have both achieved impressive poverty reduction through growth in the past 15-20 years. In Ethiopia agriculture still dominates rural employment, while in Ghana, rural nonfarm activities underpin rural employment and income growth in the more urbanized south, especially the places close to secondary cities.

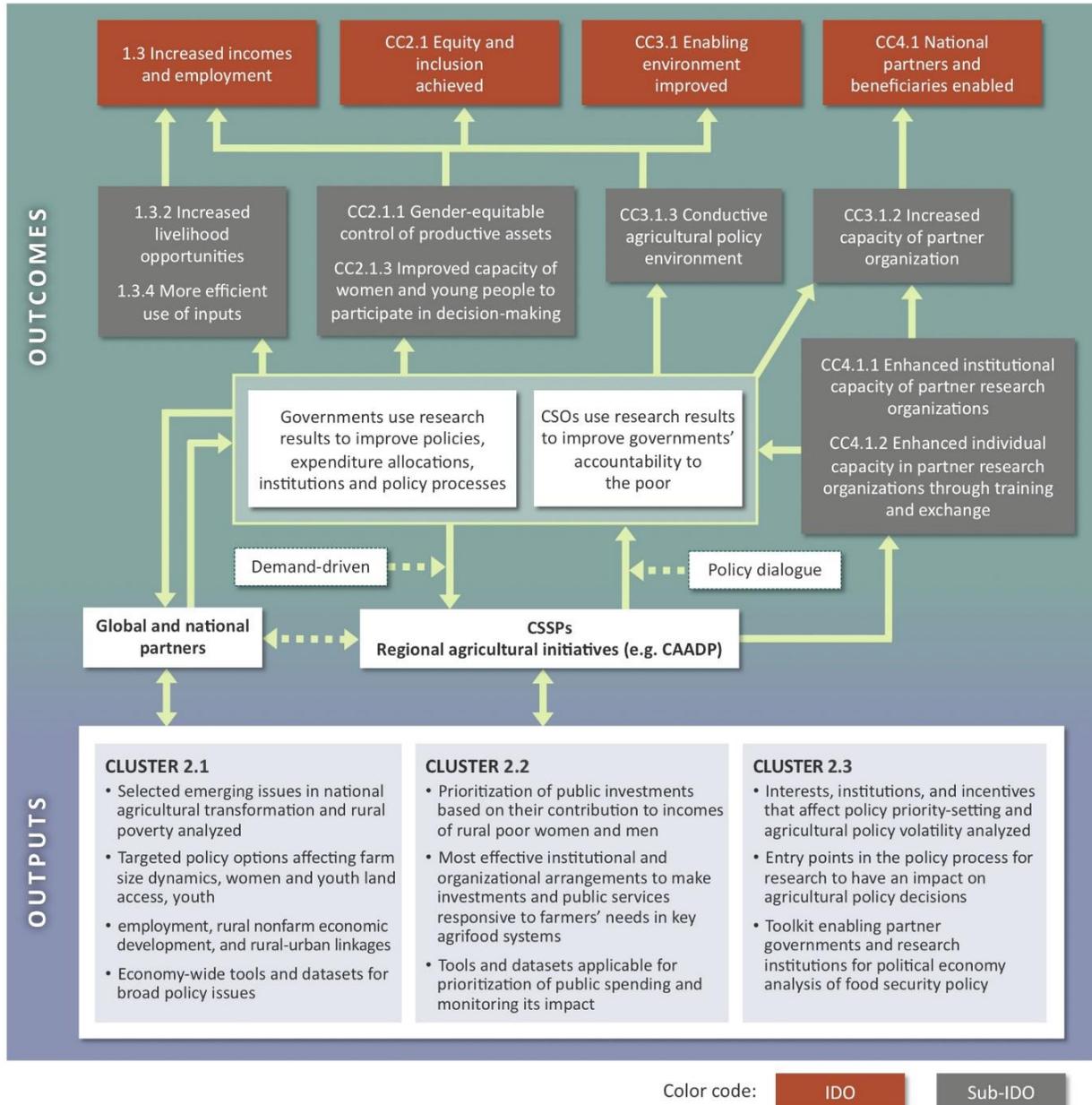
Receptivity to new thinking on the part of policy makers can be stimulated by **basic diagnostics at the national level on the status of structural transformation, rural transformation, and inclusion**. These diagnostics include analysis of sectoral growth (in agriculture, services, and manufacturing), patterns of employment and wages (particularly among youth), the relationship of the above with poverty, and identification of the key public policies, investments, and institutional arrangements that support inclusive transformation. Diagnostic assessments will suggest areas warranting further investigation, including "positive deviance" within countries, and identify likely levers for intervention. The diagnostics also produce a list of actors who will have roles in decision making, and a timeframe over which research results will be relevant. Communications strategies can be developed for working with these actors.

Figure 2.2.1.3.1 also shows the engagement of key actors in the policy process, and their empowerment through evidence and capacity enhancement. A critical mechanism for the flagship is to equip national policy analysts with data and tools to provide ongoing support to national policy processes. The policy engagement has many feedback loops to researchers, as the need for additional analysis arises. Ultimately decisions taken will require capacity development and Monitoring and Evaluation to facilitate implementation.

**Achieving impact through Flagship 2 requires connection with an array of stakeholders at the national level beyond the agricultural agencies and ministries.** Ministries of finance and planning usually decide on the funding and "policy space" allocated to agriculture, through their control of the National Development Plans and the Medium Term Expenditure Frameworks. Many countries have ministries of youth and ministries of women, rarely linked to agricultural agencies. Achieving impact depends on effective communications with all of these actors, drawing upon political economy analyses. The flagship's research partners are selected not only for high quality research, but also for policy relevance and effectiveness in communication. All research partners have considerable experience in in-country policy engagement, and strong local research networks and partnerships. Participation in fora of donor coordination and in the process of CGIAR collaboration at the national level facilitates engagement with the needed array of actors.

Research to inform national policy processes can have high payoffs, but is also inherently risky. The major risks and measures for mitigation are presented in Table 1.0.3.1.

**Figure 2.2.1.3.1: Impact pathways for Flagship 2**



### 2.2.1.4 Science quality

Science quality is assured through engagement of **an interdisciplinary team of researchers with a strong record of peer-reviewed publications in high impact outlets and experience in policy dialogue with senior national counterparts**. Team members are from within and outside CGIAR, and actively working on the theory and empirical evidence of structural transformation in Africa (Diao and McMillan 2015; McMillan and Heady 2014; McMillan and Rodrik 2016; Resnick and Thurlow 2016). In the period 2013-2015, Flagship 2 researchers have published more than 100 peer-reviewed publications. Major publications from Phase 1 include an academic book on public investment (Mogues and Benin 2012), a special journal issue on “Public investments in and for agriculture” (Mogues, Fan and Benin 2015), analysis of youth employment (Thurlow 2015), and the role of urbanization, including in secondary towns, to generate employment and reduce poverty (Dorosh and Thurlow 2013; 2014a). Team members from the flagship’s main science partners, Michigan State University and Cornell University, are well-recognized specialists on transformation, land markets and changing farm size, as highlighted in a PIM-supported special issue of *Food Policy* (Jayne et al. 2014). The team has also published extensively in the area of political economy and agricultural policy processes, including advancing theoretical understanding on these dynamics (Birner and Resnick 2010; Resnick et al. 2015) as well as empirical applications examining stakeholder engagement (Resnick and Birner 2010) and the determinants of government policy decisions during the 2008 food price crisis (Resnick 2014).

The Flagship 2 team includes agricultural and development economists, political scientists, and political economists. The team is able to link micro-level data on farms, households, and individuals, with meso-level data at the subnational level and with macro-level data (both national and cross-country) to explore transformation processes as interlinked phenomena. The use of spatially- and sectorally-disaggregated data wherever possible will enrich understanding of spatial dimensions of transformation, including lagging and leading areas, and facilitate refinement in the targeting of interventions. By combining quantitative methods (econometrics, simulation models) and qualitative methods (comparative case studies, structured interviews, process tracing, stakeholder mapping), both statistical patterns and the in-depth causal factors underlying them can be disentangled with greater confidence. The flagship team is well integrated with IFPRI’s CSSPs, and strongly informed by a deep understanding of local policy contexts.

**Cluster 2.1 on Agricultural Transformation and Rural Incomes** probes dynamics of farm size, diversification of rural incomes and employment among youth, women and men, interactions of agriculture and non-agriculture, and linkages between rural and urban economic growth. Researching these issues requires integration of micro-economic and economywide/general equilibrium methods. Some questions also require spatial approaches combining geo-referenced data and economywide analysis at spatially-disaggregated subnational levels. This **integration of macro and micro approaches to rural transformation at multiple scales of analysis constitutes the main novelty** of the cluster. Individual Cluster 2.1 researchers have coordinated major macro- or micro-oriented research projects on rural transformation, such as work within Cornell’s Structural Transformation of African Agriculture and Rural Spaces (STAARS) program, the joint MSU/IFPRI/University of Pretoria Food Security Policy project, and PIM’s past work on economic transformation and youth employment. Cluster 2.1 integrates this expertise to deepen understanding of current drivers of rural transformation and their implications for agriculture. Microeconomic techniques will help to analyze primary and secondary micro survey data and to estimate relationships between changes in farm sizes and smallholder farmers’ joint decisions to adopt technologies, engage in commercial activities, and participate in nonfarm employment including migration decisions (de Brauw and Mueller 2012; de Brauw et al. 2014). Spatially-explicit economywide

models will be used as simulation tools to assess the relationships between farm size dynamics and agricultural transformation and the potentials of different patterns of nonfarm economic growth and employment opportunities across locations, including rural towns, major cities, and more remote and lagging rural areas. The economywide general equilibrium models can simulate alternative policy scenarios while also examining differential impacts on women and young people (Dorosh and Thurlow 2013, 2014b).

**Cluster 2.2 on Public Investments and Institutions** focuses on public investment, expenditures, and service delivery in and for agriculture. The empirical aspects of the research involve microeconomic analysis at the individual, household, and frontline service provider levels, as well as econometric analysis at the country and subnational levels using panel data. In addition, the **Statistics on Public Expenditures for Economic Development (SPEED) database and data visualization tool** will be expanded to cover more years and countries, and to include disaggregated public expenditures by economic classification and function. To this effect, the team will coordinate with partners leading the World Bank's agricultural public expenditure reviews and FAO's Monitoring and Analyzing Food and Agricultural Policies (MAFAP) analyses. In addition, core models from public economics on incentive design in the public sector will be applied to account for the role of extrinsic and intrinsic motivation of agricultural public service providers. Similarly, theoretical underpinning of analysis on institutional arrangements to make public expenditures responsive to the needs of smallholder farmers and the rural poor will take into account novel models of accountability mechanisms for allocations of public resources.

**Cluster 2.3 on Political Economy and Policy Processes** analyzes how policies are made and changed, how the distribution of benefits and power dynamics between and among beneficiaries affects the process, and how information and evidence condition outcomes. The team has developed a **new conceptual framework of the political economy of policy processes known as the Kaleidoscope Model of Food Security Policy Change** (Resnick et al. 2015). The Kaleidoscope Model outlines a set of 12 conditions that help explain whether and when policy change can occur. These indicators can be operationalized through semi-structured interviews with key stakeholders and secondary data. In Phase 1, the Kaleidoscope Model was applied to explain decisions on investment in agricultural R&D, working jointly with the Flagship 1 team. More cross-country quantitative macro work will be conducted in Phase 2 by building a database on agricultural policies in Africa that can be examined econometrically using various indicators of a country's institutional heritage, regime type, public sector organization, and technocratic capacity (see Section 2.2.1.6 for more details). At the micro level, survey work on citizen preferences will incorporate innovations such as best-worst scaling (BWS) for identifying discrete preferences for rural public policy (Lusk and Briggeman 2009; Wolf and Tonsor 2013).

### ***2.2.1.5 Lessons learnt and unintended consequences***

Lessons reflected in the large literature on structural transformation remain relevant, but many analysts now question **if the experience of late transformers is likely to replicate that of countries that went through the changes earlier** (see Diao et al. 2010; Timmer 2009). Patterns of growth and structural change in late-transforming economies appear to show an enhanced role for services and modest contribution from labor-intensive export-oriented manufacturing (Diao and McMillan 2015). Research initiated in Phase 1 will help clarify the amount and nature of public investment needed to support growth in both agriculture and other sectors, and opportunities that can be created for young workers and entrepreneurs in late-transforming economies.

Research is also needed on the spatial and distributional patterns and inclusiveness of agricultural transformation (Christiaensen and Todo 2014). For example, many governments in Africa are in the process of deciding whether investments in rural towns, cities, or “growth corridors” are most effective in creating job opportunities and reducing poverty. Research will build on lessons from a recent study commissioned by ISPC on this topic. **Farm size dynamics** is a new area for this flagship, but links to previous PIM work on agricultural mechanization, youth employment, and the role of agriculture in structural transformation.

The team in Cluster 2.2 working on agricultural public investments will benefit from Phase 1 work on identifying spending patterns, analyzing the impacts of public investments, and exploring the drivers of resource allocation decisions. One of the key lessons learned from this work is that **the composition of spending within sectors matters as much as or more than allocation of funds across sectors**. Research during Phase 2 will analyze the prioritization of public expenditures both within agriculture and across sectors.

Lessons learnt from past research on political economy and policy processes emphasize the importance of credible and salient evidence (see Court and Maxwell 2005), and the role of regime type and political settlements (see Bates 1981; Bates and Block 2013; Birner and Resnick 2010; Booth 2012; Khan 1995; Poulton 2014). More recently, Booth (2011) and Levy (2014) argue that the development community needs to “work with the grain” to advance policy reform by acknowledging underlying governance challenges. Cluster 2.3 aims to build on this scholarship by providing an **applied political economy explanation for variations in policy choices resulting in different pathways and paces of rural transformation**.

Work in Flagship 2 is frequently designed to elucidate **unintended consequences of policies adopted**. Empirical display of these consequences can lead to revocation or reform of counter-productive policies. For example, export bans on staple crops are often adopted in the interests of poor consumers, but can be shown to have unintended consequences on producers and on the private sector’s incentive to invest in the value chains of affected staple subsectors. Much of the work of Flagship 2 helps policy makers assess options and see likely unintended consequences associated with each.

The planned scope for Flagship 2 during Phase 2 requires reduction or cessation of work in several areas. The activity in Central Asia is reduced to capacity strengthening in the use of tools for policy analysis. The work on regional licorice markets in Central Asia and China undertaken in support of operational work to reclaim salinated land is discontinued. The Pakistan Strategy Support Program is no longer mapped to PIM. Work on water policy in Morocco is discontinued, since PIM does not have a critical mass of work in Morocco. Work focusing on China and undertaken in partnership with the Chinese National Science Foundation will be reoriented to study China’s engagement in African agriculture.

#### **2.2.1.6 Clusters of activity (CoA)**

Flagship 2 focuses on national policy issues highly relevant to CGIAR: Cluster 2.1 on Agricultural Transformation and Rural Incomes; Cluster 2.2 on Public Investments and Institutions; and Cluster 2.3 on Political Economy and Policy Processes. These areas of focus also respond to requests from governments (often via CSSPs), other CRPs, implementation agencies, international bodies, and development partners.

### *Cluster 2.1 – Agricultural Transformation and Rural Incomes*

Proper positioning of the work of CGIAR in pursuit of the SLOs requires understanding of rural and structural transformations in late-transforming economies, including the locus of job creation, developments in land and labor markets, rural-urban linkages, and spatial and distributional outcomes of economic growth. Cluster 2.1 focuses on competition for land; age and labor in agriculture; transformation, urbanization and farm size; and isolated hinterland zones. To address these issues,

Cluster 2.1 asks three sets of interlinked **research questions**:

- What are the driving forces changing **farm size**, and how does farm size affect opportunities in agricultural employment, particularly for young people and women? How does farm size influence smallholders' decisions to adopt technologies and engage in off-farm employment? How do factors affecting farm size influence the inclusiveness of transformation (see [Masters 2013](#) and [Jayne 2013](#))?
- What motivates job creation in rural areas? Where are new **jobs** within the agrifood systems, and how can the work of the AFS CRPs influence job creation, particularly for young people? What are the synergies between agriculture and the rural nonfarm economy in creating jobs and promoting rural transformation?
- What are the **spatial and distributional implications of rural transformation**? Do rural towns and "growth corridors" accelerate the transformation of nearby rural areas and lead to more remunerative employment opportunities? If yes, what are policy options to enable private investment in the development of rural towns and growth corridors? Similarly, how can policy and public spending contribute to addressing issues of lagging regions that are home to many marginalized people?

Much of the work will be undertaken as **country case studies and cross-country comparisons**, including in countries such as Vietnam and China offering potentially useful lessons for Africa south of the Sahara. In country case studies, particular attention is paid to the heterogeneity across different development areas within countries, such as peri-urban versus more remote rural areas, and different agroecological zones. These distinctions are relevant for considering policy options applicable at the regional and subnational levels. Econometric techniques are applied to analyze primary and secondary micro survey data and to estimate the relationships between changes in farm sizes and smallholder farmers' decisions to adopt technologies, engage in commercial activities, and participate in nonfarm employment. The econometric analysis also examines how land rights and other factors influence farmers' migration decisions (de Brauw and Mueller 2012; de Brauw et al. 2014).

Micro survey data will be combined with national economic data to properly measure the rural nonfarm economy in terms of added-value and employment (disaggregated by gender and age group); its linkages to agriculture; and assess the contribution of rural nonfarm economies to urban and national economies (Diao and McMillan 2015). Spatially-explicit economywide models will be used to simulate the effects of changing farm size on employment and agricultural growth, and to assess the impact of different patterns of migration and nonfarm economic growth on agriculture and employment (Dorosh and Thurlow 2013; 2014b). Economywide models calibrated to country data will be used to simulate different government interventions that could potentially alter job creation, with consideration of differential impacts on women and young people.

In collaboration with PIM's Flagship 3, MAIZE (Flagship 1), LIVESTOCK (Flagship 5), WLE (Flagship 3) and other AFS CRPs, the models will also be used to assess economywide gains and spillover effects arising

from AFS CRPs' work. Considerations include the number, type and quality of jobs created in value chains and growth corridors; complementary roles of urban, peri-urban, and rural agriculture in feeding growing cities; and the impacts of rapidly changing rural and peri-urban landscapes on young people and women. For example, if a technological breakthrough in dairying increases the volume of milk produced and attracts cheese makers that employ workers and increase demand for transport with additional multiplier effects, the economywide models will capture this, while partial equilibrium analysis would not. Drawing on analyses conducted by the AFS CRPs and other flagships of PIM, the economywide and spatial models will also be useful in examining the potential growth and distributional impacts of work within the AFS CRPs.

Under Cluster 2.1, **social accounting matrices (SAMs)** and **computable general equilibrium (CGE) models** are periodically updated. In Phase 1, PIM generated SAMs together with or on behalf of a dozen low- and middle-income country governments, including in CGIAR countries of collaboration. These tools are in high demand and this work will continue.

### *Cluster 2.2 – Public Investments and Institutions*

Cluster 2.2 considers the broader role of the public sector in supporting transformation. By providing public goods and services, governments play a key role in enabling private investments of farmers and of rural enterprises. Given competing demands for public funding, budget allocations to agriculture are always contested, and usually constrained at sub-optimal levels. The composition of spending is thus very important. Moreover, if public money is spent inappropriately, it has the potential to crowd out private investment, thus doubly inhibiting growth. Cluster 2.2 therefore asks the following three sets of **research questions**:

- How can **public expenditures** be prioritized to contribute most to the performance of the agricultural sector and to reduce poverty? How do public investments affect the process of rural transformation and its inclusiveness?
- What are feasible ways to structure responsibilities within public agencies and create incentives for public sector staff, such as frontline service providers, to efficiently **deliver services of good quality**? How can the distribution of resources and responsibilities across different tiers of government be designed to maximize the effectiveness and inclusiveness of publicly-provided goods and services?
- What **institutional arrangements** promote participation of the poor in decisions on the provision of public goods that are responsive to the needs of women, men, young farmers and other rural residents?

Returns to public investment will be assessed for selected African countries, building on PIM research in Phase 1. **Types of public spending in agriculture** (e.g. R&D, extension, irrigation, subsidies) are assessed for their differential contributions to broad outcomes (e.g. poverty reduction, food security); sectoral outcomes (e.g., agricultural value-added, productivity); and rural transformation (e.g., nonfarm activities, women's entrepreneurship). Analysis will also account for investments in nonagricultural areas (e.g. road infrastructure, health, and education). Little has been done, especially in Africa, to disaggregate public spending at the subsectoral level and evaluate the composition of agricultural budgets. This cluster will provide evidence to policy makers for prioritizing public agricultural investments.

The organization of the public sector and configuration of agencies affect returns to spending through impact on the quality of services. Poor service delivery is often attributed to low capacity, when in fact the issues may be related to suboptimal organization and incentives. Thus, Cluster 2.2 will also provide

evidence on **ways to structure, organize, and incentivize public agencies** to increase the effectiveness of investments for the rural poor. This includes institutional arrangements for public agencies to obtain information on rural residents' needs and priorities. Cluster 2.2 will analyze how different institutional arrangements affect the quality and responsiveness of public services affecting agriculture, including road and water infrastructure, health, and education. Work with the AFS CRPs will identify effective participatory platforms allowing two-way feedback between farmers and agricultural service providers. Work will continue to enhance the tools and methods for tracking and analyzing public spending in agriculture. **SPEED** will be further expanded to cover more years and more countries, and will include disaggregated data on public spending by economic classification, and for selected countries by function. Continued enhancement of the SPEED tool will benefit from coordination and collaboration with ongoing partnerships, such as with the World Bank and FAO-MAFAP.

### *Cluster 2.3 – Political Economy and Policy Processes*

Cluster 2.3 focuses on how the dynamics of political economy constrain or facilitate the adoption and implementation of policies supportive of inclusive transformation. Achieving impact through policy-oriented research requires an understanding of **why certain agricultural priorities are chosen over others, as well as why there is often a gap between recommendations flowing from robust evidence and policy actions taken**. The constraints on the policy and institutional environment are complex, and often combine ignorance of unintended consequences, weak capacity to implement policies, and power of entrenched special interests. Diagnosing the relative weights of these and other factors helps identify entry points for CGIAR and other partners to enrich the process by providing evidence to actors who can use it.

Cluster 2.3 is designed to address three sets of **research questions**:

- How does the **political economy condition outcomes of rural transformation**? How do the time horizon of investments, the relative power and organization of stakeholders, the spatial distribution of benefits, and the availability of different economic resources influence decisions on policies and spending?
- Why are **agricultural policies more volatile** in some countries than others? Is volatility greater in relation to staple crops, which a majority of smallholders produce and the poor consume, than for export or horticultural commodities? Does volatility affect women more than men, and the young more than the elderly?
- Which **institutional reforms in the public sector** can contribute to improved agricultural policy formulation and implementation?

Attention will be given *inter alia* to addressing why governments do not invest in areas where research indicates that high returns to agricultural productivity or poverty reduction can be achieved. For example, agricultural research and development, extension, or feeder roads consistently receive less funding than technical analysis suggests would be warranted (Lynam et al. 2016; Fan et al. 2008; Mogues and Benin 2012). Instead, support often goes to short-term or highly visible interventions that are regressive and fiscally unsustainable, such as agricultural input subsidies (see Poulton 2014). The conceptual framework of political economy of policy processes recently developed by IFPRI and its partners, known as the **Kaleidoscope Model of Food Security Policy Change** (see Resnick et al. 2015) will help guide focused case studies on these issues. Subsequent work will address topics selected jointly with other CRPs; candidate topics include the political economic calculus associated with commitment to growth corridors and land tenure reforms.

The second area of work considers **drivers of policy volatility**, which refers to shifts in policy direction and implementation, often reflected in the imposition (and lifting) of import and export bans, crop levies, input subsidies, and changes in procurement rules. The lack of predictability in the policy-making process can undermine investment and growth (Fatás and Mihov 2013), exacerbate price instability, and erode trust of farmers for governments. This strand of work aims to measure volatility, and determine whether there are institutional factors that contribute to it, why it may be concentrated around certain commodities, whether it can be predicted, and what options exist to contain it.

The third area of work addresses **underlying institutional constraints** to implementing evidence-based policies. To improve public sector capacity, many African governments are adopting models from Asia (e.g. delivery units, performance contracts, executive agricultural agencies). Building on existing research supported by ReSAKSS Asia and the Food Security Policy Project, this work examines whether African reforms achieve intended goals of enhanced performance and accountability. Attention is given to “isomorphic mimicry” (Andrews et al. 2012) and “institutional monocropping” (Evans 2004), i.e., importing institutional structures that formally resemble best practice but practically operate differently in local contexts. A **toolkit for conducting political economy analyses** will be developed, based on the Kaleidoscope Model, and will be made available to CGIAR researchers, PIM collaborators, national counterparts, and development partners. An **agricultural policy database** will be developed and informed by FAO-MAFAP, the World Bank’s Enabling Business of Agriculture Initiative, and the CSSPs. The database will combine indicators of a country’s political, institutional, and policy context. Cross-country and time-series statistical analysis will test hypotheses linking political economy theories to agricultural policy decisions. Survey work in CGIAR countries of collaboration will look at how well national policies conform to policy preferences of rural citizens and if particular interest groups are able consistently to block needed reforms.

The three clusters will work **jointly with research teams from other flagships of PIM**. Information on future labor and land costs in selected countries can be used to evaluate long-term changes in factor costs in Flagship 1’s foresight modeling work. Flagship 2 researchers work with the foresight modeling team (Cluster 1.1) on investment needs for future growth and with the science and technology policy team (Cluster 1.2) on the political economy of agricultural R&D investments and the technology adoption implications of farm size dynamics. Researchers in Flagships 2 and 3 will work together on economywide implications of value chain development. The work of Flagship 4 on the costs of social protection will be coordinated with that on public expenditure in Cluster 2.2. Work on land and changing farm size is coordinated with that on land tenure in Flagship 5. Three team members in Flagship 2 are active in Flagship 6.

**Researchers in Flagship 2 will work jointly with other CRPs.** Cluster 2.1’s models will be used with A4NH (Flagship 1) to assess how urbanization and income growth drive dietary change; with WLE (Flagship 3) to examine how urban and peri-urban food systems affect agriculture and employment (given energy and water constraints); and with MAIZE (Flagship 1) and LIVESTOCK (Flagship 5) to evaluate the combined impact of farming and feed arrangements on rural incomes and employment. Cluster 2.2 will work with MAIZE (Flagship 1) to prioritize public investments in maize systems. Analysis of political economy in Cluster 2.3 will be strengthened through linkages with A4NH (Flagship 4).

### **2.2.1.7 Partnerships**

PIM’s **comparative advantage** in Flagship 2 derives from the technical competence of the research team, the relevance of the work to the portfolio of CRPs, and the unique contribution that Flagship 2 provides

in conjunction with other partners. The cross-disciplinary team is able to straddle research spanning technology, economics, policies, institutions, and political economy. The team includes leading analysts in agricultural and development economics, with extensive in-country experience in Africa and demonstrated policy influence. Team members can address the macroeconomic dimensions of structural transformation as well as the microeconomic issues of household decision making and behavior of public institutions and servants. PIM is the main developer of the databases and tools needed to conduct economywide analysis and track public investment in the CGIAR countries of collaboration. Other organizations are active on issues of rural and structural transformation. For example, Oxford University's Centre for the Study of African Economies (CASE), the Future Agricultures Consortium (FAC), IFAD, and FAO each have long-standing interest and analytical engagement on the topics of Flagship 2. PIM's team benefits from the work of these groups, and often interacts with them, but has tools and engagement at the country level that other organizations do not. PIM is also better able than external groups to convey research findings and perspectives to the CGIAR audience, and thus to inform other CRPs on topics related to transformation and political economy.

The key research partners of this flagship are **Michigan State University's** Department of Agricultural, Food and Resource Economics, and **Cornell University's** Dyson School of Applied Economics and Management. MSU has capacity building and policy engagement programs in Mozambique, Tanzania and Zambia, and research linkages with University of Pretoria. MSU is also a close partner of the Regional Network of Agricultural Policy Research Institutes (ReNAPRI) in Eastern and Southern Africa. One of the three pillars of the Cornell-led STAARS Project includes mentoring of young African scientists.

The main implementation partners include **government partners and research networks of IFPRI's CSSPs in Ethiopia, Ghana, Malawi, Nigeria (jointly with MSU), Uganda, and the country office of the joint MSU-IFPRI program in Tanzania**, which play key roles in engaging in national policy processes, collaborating with local researchers, and building capacity. In addition, two units of **FAO** are important partners: the Social Protection Division's Rural Employment Unit, and the MAFAP program. Together with national governments, the FAO-ESP is implementing rural employment programs, often targeting youth, in the Flagship 2 countries of emphasis (Ethiopia, Ghana, Malawi, Mozambique, Nigeria, Tanzania, Uganda) and more broadly. FAO-MAFAP will be involved in all three clusters: they will contribute to developing economywide databases for African countries under Cluster 2.1, and to data collection and research on analysis of the returns to public expenditures in the agricultural sector under Cluster 2.2. A locus of engagement in Cluster 2.3 will be MAFAP's Policy Issues Database, which documents policy priorities and levels of implementation across African countries. **Africa Lead**, a USAID-funded program for capacity building in Africa south of the Sahara implemented through DAI, Management Systems International, Training Resources Group, and Winrock International, is another implementation partner, particularly for Cluster 2.3. Africa Lead has expressed interest in working with the PIM team on developing a political economy toolkit that could be used in their capacity building workshops with African partners.

### **2.2.1.8 Climate change**

The tools and methods developed under Flagship 2 are relevant for consideration of issues germane to climate change. Recent studies measured climate change impacts on African and Asian economies using models developed in Phase 1 (Arndt et al. 2014; Arndt and Thurlow 2015; Thurlow et al. 2012), and confirmed that **the impact of climate change on agricultural futures affects the pace and nature of rural transformation**. Impacts on agriculture and rural incomes are also influenced by economywide factors, such as road damages, or the role of migration and nonfarm jobs in cushioning income shocks. As

highlighted in a recent World Bank report on the Future of the African Drylands (Cervigni and Morris 2016), to which PIM contributed, the economywide effects of climate change are particularly relevant for at least three of Flagship 2's focus countries: Ethiopia, Ghana, and Nigeria. The spatial dimensions of rural transformation studied in Cluster 2.1 and the investment decisions to spur transformation will need to account for climate change and associated shifts in agricultural production, migration or nonfarm employment.

As information about the impact of climate change becomes available with more reliable timing and spatial detail, it will be able to inform decisions about public spending. **The analysis of priorities for public expenditure will need to include costing of plans for mitigation and adaptation to climate change**, with consideration of subsidiarity between and among levels of government since climate impacts vary by location.

**Decision making with regard to climate change has a strong dimension of political economy motivating the debate.** The tools for political economy analysis described above can be applied to understand the coalitions and interest groups in play in the national dialogue about climate preparedness and allocation of resources to promote it. This is a candidate topic for political economy analysis under Cluster 2.3.

#### **2.2.1.9 Gender**

Gender analysis is well represented in the work of Flagship 2. A study on migration and gender roles in agricultural transformation in Africa jointly conducted with the Flagship 6 team is part of the Cluster 2.1 portfolio. This study will explore the extent to which gendered migration trends in Africa lead to a feminization of agriculture, and whether this leads to changes in decision-making authority and implications for women's time allocation, and the selection of technologies. Similarly, work on youth employment will look at jobs for young men and women, and analyze the constraints and opportunities for both.

Research in Phase 1 found that men and women have differential access to public goods and services, indicating that public expenditures could affect men and women differently (Mogues 2013; Mueller et al. 2015). Research under Cluster 2.2 assesses (a) how public expenditures differentially benefit men and women; (b) how public agencies involved in service delivery should be organized to increase access by women and girls to services; and (c) which institutional arrangements can ensure that the priorities of both female and male agricultural producers and other rural residents are heard by the public sector.

The political economy analyses of Cluster 2.3 are concerned with who has voice and power in specific policy arenas. The most significant research question regarding gender is whether and to what degree women are genuinely engaged in the major policy processes relevant to agriculture and food policy. There will be specific focus on whether organizations representing women's interests are consulted in the agenda-setting and design stages of the policy process, as well as on whether gender concerns play any role in the deliberation process among major stakeholders. One key question to be addressed is whether barriers to greater inclusion of women reflect capacity constraints on the part of women, or entrenched interests inimical to inclusion of women.

#### **2.2.1.10 Capacity development**

Two of the five elements of the CGIAR CapDev Framework that PIM prioritizes (see Annex 3.3) are emphasized under Flagship 2:

**Design and delivery of innovative learning materials and approaches.** Phase 1 showed **high demand for the tools for economywide analysis (SAMs and CGE models) and for tracking public investment (SPEED).** Demand is reflected in the large numbers of web visits and downloaded records for the SAMs and SPEED, in addition to the frequent requests of in-country training on SAMs and CGE modeling from CSSP stakeholders. The Ethiopian Development Research Institute and the Rwandan Ministry of Agriculture have benefited from capacity building on SAMs and CGE modeling in Phase 1, and in Phase 2 similar activities will focus on partners in Ghana and Nigeria, and Tanzanian partners in the MSU/IFPRI/University of Pretoria Food Security Policy project. Similar high demand exists for **policy economy frameworks such as the Kaleidoscope Model (KM).** Under the MSU/IFPRI/University of Pretoria Food Security Policy project, a number of training workshops have already taken place with USAID staff, and with counterparts in Myanmar and Malawi. A practitioners' guidebook to political economy analysis for food security policy based on the model will be available in 2018.

**Institutional strengthening** in the hosted countries is one of the major commitments of IFPRI's CSSPs, which have established long-term partnerships with several local institutions. The key research partners of this flagship, MSU and Cornell University, have long-term institutional partnerships in Africa, such as ReNAPRI in the East and Southern African countries and STAARS for the whole continent. Many research activities will be jointly conducted with local partners.

#### ***2.2.1.11 Intellectual asset and open access management***

The intellectual assets of Flagship 2 consist of publications, tools and methods, and datasets. In accordance with the CGIAR guidelines on intellectual asset and open access management, and with the policies of the lead Center and its partners, Flagship 2 will ensure access to its intellectual assets in a manner that encourages access, use, replication, and adaptation of its research while safeguarding the privacy of participants and protecting confidential and proprietary information. The IFPRI and PIM websites are the major vehicles for dissemination of the Flagship 2 research outputs. In addition, each CSSP has its own website, interlinked to the Strategic Analysis and Knowledge Support System (ReSAKSS)-Africa website. Household survey data, cross-country panel data on public expenditures, and social accounting matrix data are publicly available via the IFPRI data repository (open source Dataverse network hosted by Harvard University). Most databases relevant to Africa are made available via the website of the African Growth and Development Policy Modeling Consortium (AGRODEP). Finally, PIM has helped establish a network of international organizations, including FAO, IFAD, IFPRI, and the World Bank, who constitute the main users of and contributors to the SAMs developed in Phase 1. This open access network will be strengthened and expanded during Phase 2 in order to further raise awareness of these datasets.

#### ***2.2.1.12 FP management***

The Flagship 2 management team includes **a flagship leader, and leaders for each of the three clusters.**

**The role of flagship leaders will be expanded in Phase 2 relative to Phase 1,** especially with regards to coordinating inputs from participants, reporting on flagship-level progress and budget execution, and tracking outcomes and impact. The flagship management team will be funded for one third of FTE for oversight of the flagship. PIM will also cover the cost of a flagship management support function (to help with formulation of annual work plans, tracking of deliverables, and reporting) up to 50% FTE by flagship.

The Phase 1 leader of Flagship 2 has led the preparation process for Phase 2. Flagship leaders for Phase 2 were selected in July, 2016 through a transparent merit-based process. The PIM Management Committee approved TORs for the positions and selection criteria including experience and excellence in the field (as measured through records of ISI publications and evidence of contribution to policy and other PIM outcomes), demonstrated ability to raise funds and attract strong research and implementation partners, and managerial experience. Staff from all Participating Centers and selected external partners were invited to nominate candidates. Self-nominations were allowed. A selection panel consisting of two SPAP members, one external partner, one representative of the Lead Center, and one representative of the PMU assigned scores to the nominees. As a result of this process, Flagship 2 will be co-led by **Thomas Jayne of Michigan State University and Xinshen Diao of IFPRI** (CVs in Annex 3.8). Both will serve on the Management Committee, with a shared vote and option to rotate attendance. Cluster leaders will be chosen by September, 2016 through a participatory process led by the appointed flagship leaders.

## 2.2.2 Flagship Budget Narrative

### 2.2.2.1 General information

CRP Name	Policies, Institutions, and Markets
CRP Lead Center	International Food Policy Research Institute
Flagship Name	Flagship 2: Economywide Factors Affecting Agricultural Growth and Rural Transformation
Center location of flagship leader	Michigan State University and IFPRI (co-leadership)

### 2.2.2.2 Summary

Total Flagship budget summary by sources of funding (USD)

Funding Needed	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Total
W1+W2	2,710,000	2,710,000	2,791,300	2,791,300	2,875,039	2,875,039	16,752,678
W3	10,663,285	10,663,285	10,983,184	10,983,184	11,312,679	11,312,679	65,918,297
Bilateral	7,353,478	7,353,478	7,574,082	7,574,082	7,801,304	7,801,304	45,457,727
Other Sources							0
	20,726,762	20,726,762	21,348,564	21,348,564	21,989,022	21,989,022	128,128,702

Funding Secured	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Total
W1+W2 (Assumed Secured)	2,710,000	2,710,000	2,791,300	2,791,300	2,875,039	2,875,039	16,752,678
W3	5,653,288	3,731,170	1,865,585	847,993	0	0	12,098,037
Bilateral	6,408,795	4,229,805	2,114,902	961,319	0	0	13,714,822
Other Sources							0
	14,772,083	10,670,974	6,771,787	4,600,612	2,875,039	2,875,039	42,565,537

Funding Gap	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Total
W1+W2 (Required from SO)	0	0	0	0	0	0	0
W3 (Required from FC Members)	-5,009,997	-6,932,115	-9,117,599	-10,135,191	-11,312,679	-11,312,679	-53,820,259
Bilateral (Fundraising)	-944,682	-3,123,673	-5,459,179	-6,612,763	-7,801,304	-7,801,304	-31,742,906
Other Sources (Fundraising)	0	0	0	0	0	0	0
	-5,954,679	-10,055,788	-14,576,778	-16,747,953	-19,113,984	-19,113,984	-85,563,165

## Total Flagship budget by Natural Classifications (USD)

	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Total
Personnel	6,628,321	6,628,321	6,827,171	6,827,171	7,031,985	7,031,984	40,974,957
Travel	1,246,964	1,246,964	1,284,373	1,284,373	1,322,904	1,322,904	7,708,485
Capital Equipment	0	0	0	0	0	0	0
Other Supplies and Services	4,952,543	4,952,543	5,101,120	5,101,119	5,254,155	5,254,155	30,615,639
CGIAR collaborations	0	0	0	0	0	0	0
Non CGIAR Collaborations	5,607,311	5,607,311	5,775,530	5,775,530	5,948,796	5,948,796	34,663,277
Indirect Cost	2,291,621	2,291,621	2,360,369	2,360,369	2,431,180	2,431,180	14,166,344
	20,726,760	20,726,760	21,348,563	21,348,562	21,989,020	21,989,019	128,128,702

## Total Flagship budget by participating partners (signed PPAs) (USD)

	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Total
IFPRI	19,736,762	19,736,762	20,328,865	20,328,866	20,938,732	20,938,731	122,008,720
CIMMYT	629,999	629,999	648,900	648,899	668,367	668,367	3,894,534
IWMI	210,000	210,000	216,300	216,300	222,789	222,788	1,298,178
MSU	149,999	150,000	154,500	154,500	159,135	159,135	927,270
	20,726,760	20,726,761	21,348,565	21,348,565	21,989,020	21,989,021	128,128,702

Explanations of these costs in relation to the planned 2022 outcomes

Flagship 2 studies economywide factors affecting growth and rural transformation (e.g. factor costs, farmsize dynamics, migration), consequences on growth and poverty, and effects of policies and public expenditures on these outcomes. Most of the work in Flagship 2 is at the national level. The W1-2 allocation will mainly be used to upgrade the models and tools (social accounting matrices, SPEED database) and undertake cross-country analysis on rural transformation to inform policy decision making at the national level.

An important risk to spending in this flagship is political stability in the countries of focus. While W1-2 resources can be shifted from one country to another, that is not true of the bilateral support for IFPRI's Country Strategy Support Programs. Other risks to spending mentioned in the program-level budget narrative apply to Flagship 2.

**2.2.2.3 Additional explanations for certain accounting categories**

**Benefits:** Benefit costs primarily include leave, health, and pension costs. The costs are pooled and allocated over a base consisting of total labor. The benefit pool divided by total labor creates the rate applied to labor. For most partners, the benefit rate used in this budget was the benefit rate for the Lead Center, i.e. 58.5%.

**Other supplies and services:** The "Supplies and services" category represents about 28% of the direct costs. This category includes field surveys; research support; cost-shared services for IT and other; workshops and training, including capacity development, meetings and conferences; editing and publications; miscellaneous charges such as copying and fax; a few partners also include benefits in this category.

### 2.2.2.4 Other sources of funding for this project

The large bilateral/W3 donors for Flagship 2 are **USAID (directly and through Michigan State University), the Russian Federation, DFID, SDC, and BMGF**. In Phase 2, additional funding will be sought from government partners and research networks for IFPRI's CSSPs.

### 2.2.2.5 Budgeted costs for certain key activities

	Estimate annual average cost (USD)	Please describe main key activities for the applicable categories below, as described in the guidance for full proposal
Gender	5,803,494	See below and flagship narrative
Youth (only for those who have relevant set of activities in this area)	6,908,230	See below and flagship narrative
Capacity development	5,181,691	See below and flagship narrative
Impact assessment	621,803	See below and flagship narrative
Intellectual asset management	0	See below and flagship narrative
Open access and data management	0	See below and flagship narrative
Communication	750,437	See below and flagship narrative

**Gender:** The gender component of Flagship 2 is derived by assigning a gender percentage to each of the Sub-IDOs that the flagship contributes to (see Table C of the Performance Indicators Matrix). For the Sub-IDOs under IDO CC2.1 on Equity and inclusion achieved, the gender percentage is assumed to be 100%. Using this methodology, the Flagship 2 **gender budget for 2017** is estimated at **\$5.8M**, which represents **28%** of the total flagship budget. Key gender activities in Flagship 2 are described in Section 2.2.1.9 of the Flagship 2 narrative.

**Youth:** For this flagship the level of intensity in addressing youth issues is estimated at **33%**, that is **\$6.9M in 2017**. The contribution of Flagship 2 to PIM's youth strategy is described in Annex 3.5.

**Capacity development:** The capacity development component of Flagship 2 is derived by adding up the flagship contributions to the capacity development Sub-IDOs, i.e. Sub-IDOs CC2.1.3, CC3.1.2, CC3.1.3, CC4.1.1, and CC4.1.2 (see Table C of the Performance Indicators Matrix). It is assumed that the flagship's contributions towards other Sub-IDOs do not count as capacity development. Using this methodology, the Flagship 2 **capacity development budget for 2017** is estimated at **\$5.2M**, which represents **25%** of the total Flagship 2 budget.

**Impact assessment:** The impact assessment budget is estimated to be **3%** of the flagship budget, for a total of **\$621,803 in 2017**. An example of activities counted in this budget is the use of economywide models to conduct ex ante and ex post assessments of policy outcomes to feed into impact assessments of PIM research.

**Open access and data management:** PIM is fully committed to complying with the CGIAR Open Access and Data Management (OADM) Policy and its Implementation Guidelines. Major infrastructures and staff required to do so are covered through overhead costs charged by the Centers, and include: maintenance of digital content collections; Online Public Access Catalog (OPAC)/library catalog systems; website

development related to repositories; promotion and training in support of OA/OD. Additional costs specific to PIM research activities (essentially OA fees for journal articles) are budgeted for at project level under Supplies and Services.

**Intellectual asset management:** As explained in Annex 3.10 of the proposal narrative, the budget for IA management is the same as the budget for OA management (see above).

**Communications:** As described in PIM's Communications Strategy, flagship leaders will appoint a staff member responsible for liaising with the Program Management Unit, participating in the PIM communicators group, and supporting the flagship's communications activities, which include: contributions to the PIM newsletter and blogs; organizing knowledge sharing and capacity building events on the topics of the flagship research; representing PIM at local/regional events; and supporting application of the PIM Branding and Acknowledgement Guidelines at flagship level. It is estimated that these tasks will represent 0.3 FTE of a Communications Specialist, or about \$25K annually per flagship. In addition, Supplies and services include communications-related items, among which publications and workshops; these items are estimated to represent 3.5% of the flagship budget i.e \$725K in 2017. The total is **\$750K (3.6% of the total Flagship 2 budget)**.

#### **2.2.2.6 Other**

Please disregard the FTE allocations columns in the budget template (the computation of this item is not appropriate for an aggregated presentation of the personnel costs). The approximate number of FTE (average across years) for this flagship is 38. See Annex 3.8 for the CVs of the core members of the flagship team.

The total time dedicated to the **flagship coordination activities** is estimated at about 30% FTE. Following the guidance in the case when this percentage is below 50%, the corresponding costs are included in the flagship budget. PIM will also cover the cost of a flagship management support function up to 50% FTE by flagship; the corresponding costs are included in the program management costs.

There are no plans to purchase capital equipment.

## 2.2.3 Flagship Uplift Budget

Outcome Description	Amount Needed	W1 + W2 (%)	W3 (%)	Bilateral (%)	Other (%)
Governments in 1 additional CGIAR country of collaboration use empirical evidence and quantitative methods to modify their allocation of public resource towards better targeted investments favoring inclusive agricultural growth and rural transformation (includes capacity development)	2,000,000	100	0	0	0
Governments in 1 additional CGIAR country of collaboration use tools and evidence on the economy-wide factors affecting rural transformation to develop policies that are better targeted towards raising agricultural growth and rural incomes (includes capacity development)	2,500,000	100	0	0	0
Agricultural growth and rural incomes are increased (above counterfactual trend) in 1 additional CGIAR country of collaboration implementing evidence-based policies and/or public expenditure allocations (includes capacity development)	2,500,000	100	0	0	0

## 2.3 Flagship 3: Inclusive and Efficient Value Chains

### 2.3.1 Flagship Project Narrative

#### 2.3.1.1 Rationale, scope

A value chain is **the sequence of interlinked agents and markets that transforms inputs and services into products with attributes for which consumers are prepared to pay**. Millions of low-income people, a large proportion of whom are women, participate in agricultural value chains as producers, small-scale traders, processors, and retailers. Many millions more, including the great majority of the developing world's poor, participate in value chains as consumers.

Smallholder farmers, women, young people, and members of marginalized groups often face barriers to participation in value chains. These barriers reduce the degree of commercial engagement of these actors, and diminish prospects for income growth (Singh, Squire, and Strauss 1986; de Janvry et al. 1991; Omamo 1998; Stoian et al. 2012; Johnson et al. 2016). When participation is inclusive but the value chain is performing poorly, for example by generating high transactions costs, the benefits of participation are diluted. **Improving the efficiency (that is, reducing the cost of moving products along value chain nodes) and inclusiveness of value chains** is therefore a centerpiece of many efforts to meet the SDGs on poverty and hunger, to achieve the CGIAR System-Level Outcomes, and to address global challenges of agrifood systems. Improved performance of value chains also directly addresses several of the SRF **grand challenges**, notably reducing postharvest losses, contributing to more nutritious foods and diverse diets, improving food safety, and supporting the emergence of new entrepreneurial and job opportunities.

Flagship 3 is the locus of PIM's work on value chains. It contributes particularly to the **growth and inclusion** dimensions of the conceptual framework of PIM shown in Figure 1.0.6.2 (Section 1.0.6). The flagship addresses the **enabling environment (global, regional, and domestic) in which value chains operate (Cluster 3.1)**, identifies **weak nodes in the chains, and designs and tests interventions to strengthen these (Cluster 3.2)**, and provides insights into **how interventions found successful in pilots can be adopted on a larger scale (Cluster 3.3)**.

**Research questions** include (see Section 2.3.1.6 for more detail):

- How do changes in **trade policies or institutions** affect poor producers and consumers, at which nodes of the value chain do they exert impact, and are men and women affected differentially?
- Where do **bottlenecks** most limit specific value chains, who is most affected, and what interventions can overcome these bottlenecks?
- How large are **postharvest losses**, and where do they enter specific value chains?
- Which models and mechanisms are particularly effective in **promoting adoption at scale of interventions to improve the efficiency of value chains** and increase inclusion, particularly of smallholders?

Analysis of trade is important to CGIAR. Over the last 20 years, the relative weight of developing countries in globally traded calories has grown from about one fifth to just under half. This shift reflects the increased importance to developing countries of trade in calorie-dense foods, many of which are within the mandate of CGIAR. These **trade flows are affected significantly by policies enacted at the national level, and by rules and agreements established at the global level** (Aramyan et al. 2005; Lohman et al. 2004; Lambert and Pohlen 2001; Beamon 1999).

Over the past 10-15 years, **many analyses of the performance of specific value chains have been undertaken**. Interventions to improve efficiency and inclusion have been designed and implemented by governments and their development partners and private firms (Seville et al. 2011; Vorley et al. 2012; Donovan et al. 2008; Gereffi et al. 2005; Miller and Jones 2010). **This growing body of work has not achieved the desired impact** for several reasons (Donovan et al. 2015). The choice of value chains studied and of interventions to improve them is not systematically informed by prioritization to assure that they are of high importance for large numbers of poor smallholders. Gender analysis is not regularly undertaken. Interventions are not always rigorously tested or analyzed for scalability, and hence conventional M&E results may lead to erroneous conclusions about prospects for impact. Generalizable conclusions are not regularly drawn, and few methodological guides are available to underpin efforts to scale up successful pilots. Work in Flagship 3 is designed to address these shortcomings.

PIM's Flagship 3 brings together economists and other scientists from across CGIAR in an active **community of practice**, recognized favorably in the recent evaluation of PIM. In Phase 1, in addition to developing a substantial body of new research and creating [a portal to share analytical methods and tools](#), the team established three **regional value chain hubs** in Peru, Senegal, and Ethiopia to facilitate dissemination of research results and build capacities of partners to undertake work on value chains. In Phase 2 the hubs' activities will continue and their contributions will be assessed.

Flagship 3's research on trade contributes to the work on foresight modeling in **Flagship 1**. Collaboration with **Flagship 2** is in the area of job creation along the value chain and diversification of rural livelihoods in the course of rural transformation. Collaboration with **Flagship 6** addresses gender dimensions of change in value chains as part of the inclusion agenda. Joint efforts with **other CRPs** to diagnose and address major constraints to commercialization within the Agrifood CRPs are shown in Table 2.3.1.7.1.

Work during Phase 2 will be **concentrated around the value chain hubs in Eastern and Southern Africa (Ethiopia, Kenya, Tanzania, Uganda), Western Africa (Ghana, Nigeria, Senegal), and Latin America (the Andean countries, Honduras, Nicaragua)**. Through collaboration and co-investment with the AFS CRPs, the Flagship 3 team intends to expand coverage of the flagship in **South Asia (Bangladesh, India, Nepal), Southeast Asia (Cambodia, Myanmar, Vietnam), Latin America (Bolivia, Colombia, Ecuador, Guatemala, Haiti, Mexico), and North Africa (Morocco, Tunisia)**.

### **2.3.1.2 Objectives and targets**

The work of Flagship 3 contributes to **increased commercialization of smallholder agriculture in developing countries in ways that improve the welfare of producers and reduce costs for consumers**.

Flagship 3 contributes primarily to the IDOs on Enhanced smallholder market access (1.2), Increased incomes and employment (1.3), Increased productivity (1.4), Enabling environment improved (CC3.1), Equity and inclusion achieved (CC2.1), and National partners and beneficiaries enabled (CC4.1). The main contributions to Sub-IDOs are shown in Table 2.3.1.2.1.

**Cluster 3.1** addresses trade, trade policy, interlinkage of food markets with those of energy (e.g., the importance of fertilizer and biofuels on agricultural prices) and other commodities, and diagnostic assessments of value chains using tools to measure distortions and their manifestations along the chains. The trade work conducted by IFPRI and supported by PIM in Phase 1 is recognized and appreciated by

developing-country partners. Support for this work will continue in Phase 2, with the objectives of **empowering representatives of developing countries to participate effectively in negotiations regarding rules for agricultural trade, and supporting global, regional, and national bodies active in trade and market policy**. PIM researchers will continue to provide evidence on the likely growth and distributional effects of alternative trade-related policies in the WTO process, in regional processes (especially with ECOWAS and COMESA), and in selected national processes upon invitation. This body of work is aligned with the cross-cutting Sub-IDO on Conducive agricultural policy environment (CC3.1.3).

Outlooks for agricultural prices and use of agricultural resources depend on developments in closely linked markets, particularly those for energy and fertilizer. Given the fluctuations in **energy markets and their implications for agricultural prices**, CGIAR should retain capacity to understand developments on biofuel markets and influence biofuel policy. The relevance of biofuels for land use and climate change provides further justification for investment in this topic.

**Tools to measure distortions in agricultural markets** can be very informative in diagnosing the aggregate degree of under-performance of value chains, and to locate sources of loss at nodes along the chains. These tools are co-developed by PIM and partners in Cluster 3.1, and used by stakeholders (within CGIAR and external) in the value chains **to assist with prioritization of analysis of value chains** and corresponding interventions.

Following upon diagnostic assessment of constraints as described above, **Cluster 3.2** zeroes in on the weakest nodes of the chain (described in Figure 2.3.1.3.1), and suggests interventions to strengthen these points. Researchers work with AFS CRPs, national counterparts, development partners, NGOs, and private firms to design and rigorously test interventions. The implications of the interventions for women, low-income farmers, members of marginalized groups, and young people are assessed in order to draw conclusions for inclusion. The emphasis of Cluster 3.2 is on findings generalizable across value chains and client groups, and on impacts up and down the chain. The objective of this work is **to facilitate linking large numbers of poor farmers to markets with increased associated benefits, and to reduce costs to consumers** (thereby linking to various Sub-IDOs related to market access and incomes). The work on losses across the value chain is included in this cluster, with the objective **better to measure and ultimately to reduce such losses** by identifying where along the value chain they occur. The intended outcome of this work is **application of value chain innovations by AFS CRPs, private companies, development partners, and NGOs**.

**Cluster 3.3** aims to **improve understanding of the circumstances under which promising interventions and institutional innovations in value chains can be effectively used at scale**. Despite recognition of its importance, the science behind adoption at scale is not well-developed. Cluster 3.3 assesses the influence of contextual (e.g. geographic, demographic, institutional) factors on the success of value chain interventions to enable AFS CRPs and other partners to estimate the potential returns to interventions in different locations. This research will assist in targeting of efforts to take interventions to scale, provide a better understanding of the limits of scaling, and complement the efforts of the AFS CRPs to increase the scale of technological interventions; it will also complement research in Flagship 1 on methods for dissemination of technology. Work is planned in partnership with research centers (Jameel Poverty Action Lab (J-PAL), Duke University, and Wageningen University and Research Centre), implementing agencies (IFAD, USAID-Feed the Future Scaling Up Initiative, Technoserve, and CRS), and the private sector. Significant bilateral funding opportunities already secured to start activities in Honduras, Guatemala, Malawi, and Senegal will complement the modest W1-2 allocation for this cluster.

**Table 2.2.1: Contributions of Flagship 3 to the CGIAR Sub-IDOs**

Sub-IDOs	Relative contribution (%)
1.2.1 Improved access to financial and other services	10
1.2.2 Reduced market barriers	20
1.3.2 Increased livelihood opportunities	5
1.3.3 Increased value capture by producers	10
1.3.4 More efficient use of inputs	5
1.4.1 Reduced pre and postharvest losses, including those caused by climate change	10
CC2.1.1 Gender-equitable control of productive assets and resources	10
CC3.1.3 Conducive agricultural policy environment	15
CC4.1.1 Enhanced institutional capacity of partner research organizations	5
CC4.1.2 Enhanced individual capacity in partner research organizations through training and exchange	10
Total	100

**Specific outcomes of Flagship 3** include:

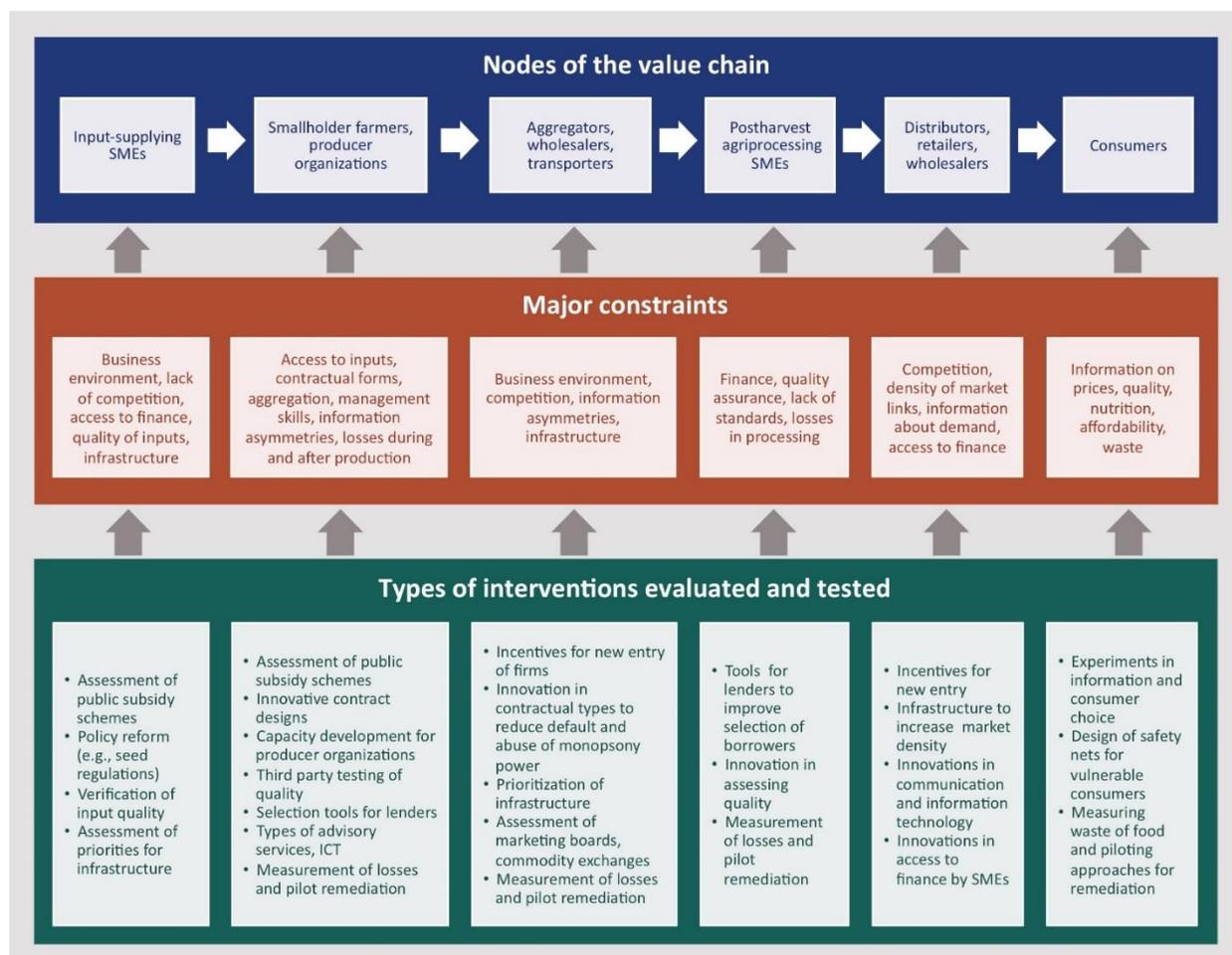
- The capacity of partner organizations in value chain analysis is strengthened.
- Research and development organizations use PIM tools for value chain analysis and development (in 20 instances in six countries of CGIAR collaboration by 2022).
- Evidence is used to support changes in trade policy and/or regulations with global and regional implications (in three instances by 2022).
- Research and development organizations use PIM tools to address postharvest losses (in ten countries including five CGIAR countries of collaboration by 2022).
- Implementation partners in three countries use analysis of approaches to scaling to increase numbers of beneficiaries by 50% in designated projects.
- Earnings of smallholder male and female farmers from specific value chains increase by 20% as a result of interventions in these value chains in three CGIAR countries of collaboration.

### ***2.3.1.3 Impact pathway and theory of change (for each individual FP)***

The theory of change for Flagship 3 is nested in the general ToC for PIM shown in Figure 1.0.3.1. The teams address **constraints in the form of market failures and missing markets; specifically constraints to the performance of value chains, and distortions and barriers to international trade**. Major problems recurring at different nodes of the value chain are shown in Figure 2.3.1.3.1. They result in inefficiencies, excess costs, and exclusion of smallholders, women, and marginalized groups. To overcome these constraints, researchers use **all four channels of engagement described in Section 1.0.3: influencing global policies and institutions, influencing regional and national policies and institutions, contributing to program design at the local level, and developing capacity of partners**. The ToC for Flagship 3 rests on the **assumptions** that: (a) decision makers are more likely to negotiate and agree to trade reforms when they understand the implications of the various options; (b) many changes in poorly performing value chains can improve welfare for buyers and sellers along the chain, including private firms; (c) better diagnostics of value chain problems and rigorous testing of interventions facilitate identification of entry points for their remediation; (d) analysis can provide insight into more effective efforts to scale up

interventions; (e) analysis showing the impact of value chain deficiencies on women and young people empowers champions for their welfare to exert influence on the policy process; and (f) building capacity of national and local partners is key to effecting change.

**Figure 2.3.1.3.1: Linking smallholders to markets through value chain research**



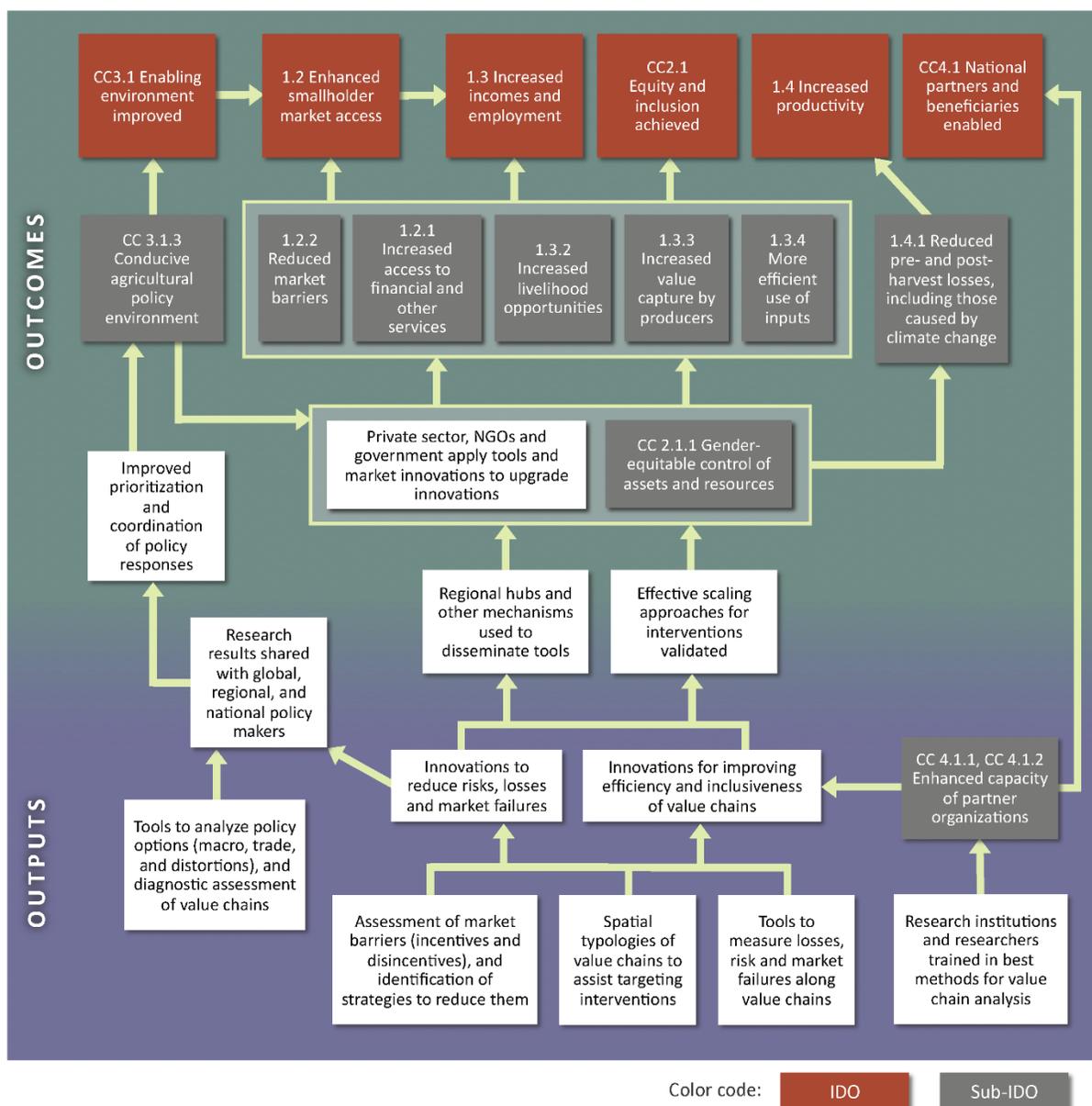
As shown in Figure 2.3.1.3.2, **engagement between researchers and actors in the policy process and private firms** is critical to success. Partners in the public sector help researchers identify opportunities in the policy process, and ensure that the research agenda meets the needs of policy makers. Regular engagement over an extended period is often required for effective influence. The work on biofuels in Phase 1, and its relevance to the European Union’s reform of biofuel policies in 2015 (discussed in more detail in Section 2.3.1.5) exemplifies this kind of engagement for impact. Similarly, the [Technical Platform on the Measurement and Reduction of Food Loss and Waste, led by IFPRI and FAO](#), will allow the work of CGIAR to influence decisions of many actors at the global and national levels. Development partners and NGOs provide inputs to prioritization and execution of research, and use research outputs (for example, contract farming designs, identification of where major losses occur across the value chain, etc.) in the interventions that they support and in advocacy with their partners and clients. Similarly, private firms use the research to change their relationships with actors along the chain. The community of practice, the [portal to share analytical methods and tools](#), and the regional hubs also contribute to the impact pathway, by reaching larger numbers of users that the Flagship 3 team can reach directly.

With regard to **trade**, the pace and timing of change is difficult to predict, and momentum can stall or accelerate unexpectedly. For that reason the analytical tools for trade research must be kept up to date and ready to deploy at short notice. With regard to **value chains**, PIM places emphasis on confirming the priority of a given constraint in relation to others, since many constraints may be operative simultaneously. For research to contribute to scaling up efforts, close interactions are needed with private sector and development organizations that have an interest in solving value chain problems at scale and whose efforts in this field provide researchers with a unique opportunity to learn on how interventions work in different contexts.

Interests of **women of all ages and young people** are addressed through analytical work that identifies their specific interests, and through empowerment of actors who advocate for them. Work includes analysis of distortions in value chains that differentially penalize women, constraints that limit women's participation, and job creation along the chain to identify entry points for young workers. With increased frequency of regional supply shocks associated with **climate change**, trade flows become very important for smoothing price fluctuations and reducing shocks to consumption.

Work of Flagship 3 on trade and value chains carries risks that technical results, even when achieved jointly with partners, may not be sufficient to motivate change. Not all reforms offer benefits to all parties; some create winners and losers. Distortions that cause inefficiencies in value chains or exclude certain groups from benefits often reflect power relations. In such cases, analysis of the **political economy** offers insights into how coalitions, including those with development partners, can shift the balance of power in favor of the poor and marginalized, and allow reforms to move ahead. The theory of change in such cases requires a combination of technical analysis and selective empowerment of partners able to shift the balance of power. The increased attention to political economy in Flagship 2 during Phase 2 will be helpful in positioning the work of Flagship 3 to effect change. Political economy analysis can also identify distortions in value chains that are so firmly entrenched in political interests that no technical research or advocacy is likely to bring change. Selectivity argues for not investing in technical research on those topics.

Figure 2.3.1.3.2: Impact pathways for Flagship 3



### 2.3.1.4 Science quality

Science quality is assured through engagement of accomplished researchers from within and outside CGIAR, use of appropriate tools and methods, and regular interaction with experienced development practitioners from implementation partners (including farmers’ organizations and value chain actors).

**In Cluster 3.1**, researchers develop and maintain large-scale **databases** that include trade flows in value, quantity, and nutrient contents, trade policy instruments at the product and bilateral level, and a global and regional system of social accounting matrices (SAM) showing international and intersectional linkages. The SAMs are complemented by satellite-based land-use information, household surveys, and other spatially disaggregated databases. These datasets are built on publicly available primary data coupled with specific information from partners. In collaboration with other international organizations

(FAO, IADB, OECD, World Bank, and others), the cluster has developed a consolidated database of measures of agricultural incentives and distortions (such as nominal rate of assistance, nominal rate of protection, etc.; see Anderson et al. 2006) by country and commodity. During Phase 2 the datasets will be extended to new value chains and/or new regions, with a priority given to CGIAR countries of collaboration.

Cluster 3.1 develops and uses **simulation models** to perform ex ante policy analysis and ex post experiments. The largest model is the **MIRAGRODEP computable general equilibrium model**, a multisectoral, multi-country, dynamic model which has been improved during Phase 1 and is a core instrument for the flagship's capacity development strategy and the AGRODEP training network (Section 2.3.1.10). The model benefits from detailed land-use patterns, detailed biofuel pathways, modeling of trade policies, and household disaggregation. During Phase 2, MIRAGRODEP will be used to assess different interventions related to farms, energy, and trade, at a global, regional, and local level. In addition, it will be further developed to allow analysis of consumptions and production patterns of different types of households, and its gender dimensions will be strengthened.

Finally, the Cluster 3.1 team manages and develops a library of **partial equilibrium models** (for example, the ERATO model) that are relevant when advanced modeling features are required, such as for modeling of imperfect competition to capture market power.

**The relevance of work under Cluster 3.1 is assured through continuous dialogues (including on-site workshops, seminars, online events, and a Delphi survey process) co-organized with partners to identify specific needs and upcoming issues, and to adapt dissemination strategies to specific audiences. These activities are critical to ensuring that data and modeling choices address priority issues of practitioners, and that results will be understood and applied.**

Research in **Cluster 3.2** uses **quantitative methods to assess the performance and impact of interventions**, as well as participatory data collection, case studies, and other mechanisms to collect price data at different nodes of the chains to pinpoint the locus of inefficiency and constraints across the value chains. **The major nodes, constraints, and types of interventions for value chains are shown in Figure 2.3.1.3.1** (Section 2.3.1.3).

The team continually seeks to upgrade methods and share results through the community of practice and through interactions with AFS CRPs. Interventions are designed for nodes where the major inefficiencies or market failures are identified, learning from existing interventions (Ashraf et al. 2009; Beaman et al. 2015; Karlan et al. 2014; Dufflo et al. 2011). The publication "Guides for Value Chain Development: A Comparative Review" (Donovan et al. 2015) summarizes approaches used to date. Researchers also use experimental and quasi-experimental methods (for a detailed review of all methods, see Khandker et al. 2010; and Gertler et al. 2011) to look at effects of value chain interventions across the different nodes. If interventions involve more than one node (for example, producers and intermediaries), impacts on both nodes must be assessed simultaneously; therefore, the teams will use innovative sampling strategies to assure sufficient statistical power. Regression discontinuity design (RDD) and fuzzy RDD designs will also be used (Jacob et al. 2012; Imbens and Lemieux 2008). The team has years of experience applying these methods in a variety of contexts, and has published this work in a range of scientific journals.

The quantitative methods described above do not allow identification of an intervention's full welfare benefits, nor do they provide measures of the performance of the whole value chain. To address this constraint, the teams will use **qualitative methods to understand the knowledge, attitudes, priorities,**

**preferences, and perceptions of target beneficiaries and other stakeholders.** These methods include focus group discussions, informal interviews, semi-structured interviews, and structured interviews (Mohr 1999; Garbarino et al. 2009; Chung 2000a, 2000b).

Research quality is assured through **a successful community of practice developed in Phase 1, which provides a platform for discussions on improvement of research design, analysis, and interpretation.**

**Cluster 3.3** investigates how value chain interventions that succeed at pilot scales can be adopted more widely. A growing body of work shows that identical policies have different effects among individuals with the same observed characteristics living in different contexts (Allcott 2011; Attanasio et al. 2003). These differences need to be understood before attempts are made to scale up interventions. Cooley and Kohl (2006), Cooley and Linn (2014), Hartmann and Linn (2008), Jonasova and Cooke (2012), and Korten (1980, 1990) have addressed the challenges of scaling up development interventions, but the current body of work does not yet provide a rigorous methodology to underpin moving from successful pilots to success at scale.

To gain new insights into scaling up, teams will use a dual approach. **The first approach** draws on recent methods that account for heterogeneity. Athey and Imbens (2006), and Gechter (2015) generalize the standard estimators from evaluations taking place in different locations, and derive an estimator that accounts for contextual variables and can be used to extrapolate results in a new location under some mild restrictions. This type of methodology allows researchers to calculate the confidence interval of the outcomes of any intervention validated in Cluster 3.2. **The second, complementary, approach** is to characterize different models of scaling up, then test them through rigorous impact evaluations. The models will follow the criteria and pathways detailed in Linn (2012); Gillespie et al. (2015); Hartman et al. (2013); and Kherallah et al. (2015). The assessment of models will be complemented by insights from experimental and behavioral economics to examine how risk aversion, ambiguity aversion, and loss aversion on the part of farmers and other value chain actors affect their willingness to adopt the interventions (Tversky and Kahneman 1992; Benhabib, Bisin, and Schotter 2009; Augenblick et al. 2015)<sup>12</sup>. As explained in Section 2.3.1.6, **ongoing development programs funded by bilateral partners provide opportunities to undertake these studies.** The teams will develop a systematic characterization of pilot programs supporting interventions in value chains to clarify common features and support learning across programs.

### ***2.3.1.5 Lessons learnt and unintended consequences***

The work proposed has a strong foundation in Phase 1, with several lessons learned that inform research in Phase 2.

A new version of the MIRAGRODEP computable general equilibrium (CGE) model has allowed assessment of agricultural trade opportunities for many low income countries, and analysis of benefits and costs of trade and storage policies under consideration in the ECOWAS region. The work in Phase 1 on measuring distortions along value chains has yielded valuable methodological insights, and allowed researchers better to distinguish and quantify the impacts of various types of distortions along a value chain for a wide range of developing countries in Africa, Asia, and Latin America. This has led to **improved computation of nominal**

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<sup>12</sup> IFPRI is a leader for implementation of these type of behavioral experiments in real settings with farmer groups and rural producers using the [IFPRI Mobile Experimental Economics Laboratory](#).

**rates of protection (NRPs), and greater ability to distinguish distortions due to market failures and infrastructure gaps from those due to policy interventions.**

The models developed and maintained by IFPRI with support from PIM during Phase 1, supplemented by regular dialogue and consultation, contributed to a **change in the European Union's biofuel policies in the Spring of 2015**. The **agreement on elimination of export subsidies at the WTO Nairobi Ministerial Conference** in December 2015, negotiated over ten years and informed by continuous modeling (see Diaz-Bonilla and Laborde 2015), is expected to boost agricultural investment in low income countries by 0.5 percent annually. These two examples show that: (a) significant impacts take time, and are hard to predict; (b) interaction with principals in policy processes is as important as sound technical work; and (c) in today's globalized world, policy changes in developed countries have major impacts on developing countries.

Work in Phase 1 to test interventions in **contract farming and third party certification** (Saenger et al. 2014), **group lending** (Gan et al. 2016), **use of new technologies** (Tadesse et al. 2015; Bernard et al. 2016a), and **organization of farmers' groups** (Bernard et al. 2016a, 2016b; Aflagah et al. 2015) led to conclusions about the performance of these interventions. Specifically, certification of the quality of high value products by third parties served to improve trust in contracts. As a consequence, farmers increased their investment in inputs by 12% and delivered higher quality to processors, with benefits to both contracted parties. Farmer groups assisted to select members with good records on financial responsibility were able to access loans for working capital and actively manage their marketing. These groups received prices 80% higher than control groups of farmers selling individually. During Phase 2, these results will be combined with enhanced work on the geographic targeting of interventions to explore replicability of the interventions (Torero 2014; Hernandez and Torero 2014, 2016). A summary volume presents additional findings regarding interventions in value chains (Devaux et al. 2016).

Researchers from CIAT, CIP, ICARDA, ICRAF, ICRISAT, IFPRI, and ILRI, together with external partners, made progress on a line of work initiated in 2015 more accurately to measure postharvest losses and understand where along the value chain they occur (Schuster and Torero 2016). Early findings reinforce **the importance of investments in infrastructure to contain losses, but also show the high cost of such investments** (Parfitt et al. 2010; Rosegrant et al. 2015).

Researchers from Bioversity, CIAT, CIP, ICRAF, and IFPRI found that **women's lower levels of asset ownership impede their full participation in value chains** (Devaux et al. 2016), which reinforces the importance of work under Flagship 6 on women's asset ownership, and will be further explored in Phase 2.

Work on **neglected and underutilized species** during Phase 1 led to the conclusion that these species do not require special approaches in value chain research. For that reason, in Phase 2 PIM will no longer give special attention to neglected and underutilized species, and will instead encourage application of the common set of tools to value chains involving these species.

### **2.3.1.6 Clusters of activity (CoA)**

Flagship 3 addresses the enabling environment in which value chains operate (Cluster 3.1); diagnosis of problems and design of interventions to improve them (Cluster 3.2); and options for implementing successful interventions at scale (Cluster 3.3). **The three clusters work synergistically. Diagnostics of the**

**performance of the chains leads to prioritization of interventions and testing of their effects, followed by analyses of scaling up opportunities where warranted.**

### *Cluster 3.1 – The Policy Environment for Value Chains*

This cluster focuses on the **domestic and international policy and institutional environment** in which value chain actors operate at the national, regional, and global levels.

**Research questions** include:

- How do changes in trade policies or institutions affect poor producers and consumers in different locations?
- How do policies targeted to a specific node of a value chain cascade up and down the chain, and how do they affect related chains?
- How does the efficiency of a value chain (that is, the cost of moving products along the chain) change with regional or global trade agreements, and how does this affect comparative advantage of a given country in international trade in commodities covered by that chain?
- Do particular distortions to agricultural incentives along the chain or at specific nodes affect women differentially?

The following **activities and methods** will be used to address these questions:

- Provide a comparative analytical framework (within and across countries, sectors, and commodities) to evaluate impacts of distortions on value chains.
- Generate evidence on how combinations of policies specific to a commodity (for example, mandatory marketing through a commodity exchange) and general to the economy (such as exchange rate controls) affect trade, agricultural growth, and inclusion.
- Provide an improved understanding of how the international institutional framework for global markets is evolving (role of WTO, importance of regional trade agreements), and of the implications of these developments for CGIAR and partners.

The comparative analytical framework is particularly useful for other CRPs, since it allows comparison of, for example, the incentives for maize production in a given country compared to those for cassava and dairy, and how policies shift incentives in favor of some products over others. The application of the models and tools along with the data mentioned under Section 2.3.1.4 facilitate production of evidence on likely outcomes of policy changes at global, regional, and national levels. A range of outcomes – trade, production, land use, prices, incomes and equity – resulting from a change in policy will be evaluated. In Phase 2, efforts will be made to link national datasets and analysis to existing models in order better to assess distributional effects of changing trade and investment patterns on smallholders, particularly women.

The key **outputs** of Cluster 3.1 include:

- Major **modeling innovations – especially in CGE modeling** – to capture spatial, technological (using detailed farm surveys), and social (gender, demographic) heterogeneity relevant for the environment in which value chain actors operate.

- **Identification of the impact of trade reforms**, technological innovations, and other shocks on groups within a society, to show the distributional effects and potential need for remedial measures.
- **Diagnostic assessment of value chains of agricultural commodities** using tools for measuring distortions and identifying which value chains incur the greatest losses, and at which nodes in the chain. This work underpins prioritization of interventions by policy makers.
- **Tools for developing countries to analyze proposed changes in macroeconomic policies** and their effects on the agricultural sector to inform internal policy debate. These tools are similar to those used in Flagship 2 (national CGE models), but bring in regional and global dimensions.
- **Measurement of employment along the value chain** and options for livelihood opportunities for women, young people, and marginalized groups, including analysis of occupational segregation at different nodes, and implications for job creation for women and members of marginalized groups.

The cluster will cover **global issues** (for example WTO negotiations) affecting all countries, **regional issues** (for example ECOWAS trade and agricultural policy agenda, trade dimensions of commitments under CAADP), and **domestic measures** (for example, trade policy and price stabilization in selected countries). The work on domestic measures will reflect the emphasis of the PIM program on **Africa south of the Sahara (primarily Ethiopia, Ghana, Nigeria, and Tanzania), and Bangladesh.**

### *Cluster 3.2 – Interventions to Strengthen Value Chains*

Cluster 3.2 focuses on solutions to recurrent bottlenecks and major constraints found in many value chains and displayed in Figure 2.3.1.3.1. Although many of these constraints are well known and of long standing, they remain unresolved for millions of smallholders.

**Research questions** include:

- Do men and women face different constraints to participation in value chains, for example with regard to risk, returns, transactions costs, start-up costs for new ventures, capacity, and information?
- Which interventions are most effective in reducing risks, and under what circumstances?
- Which interventions best address high transactions costs, and under what circumstances?
- How does the heterogeneity of smallholders and small rural enterprises affect their need for different ways to interact within value chains?
- What is the magnitude of postharvest losses? What causes them, where do they enter value chains, and how can they be reduced in a cost-effective way?

Teams working in Cluster 3.2 will apply RCTs and other methods of impact evaluation to assess specific interventions in value chains, such as changes in types of contracts. This work continues that of Phase 1, and results will populate the PIM value chains portal and be disseminated to implementation partners. Increased attention will be paid to assessment of employment along the value chain, with particular emphasis on how gender and age affect opportunities.

**Initially in one CGIAR country of collaboration, a comprehensive analysis of value chains will be undertaken** to diagnose the state of major value chains, identify bottlenecks and quantify the losses associated with them, design and test interventions, and target the location of interventions for

implementation and testing. The diagnostics and quantification of losses will use the tools for measuring distortions described in the section on Cluster 3.1. The identification of bottlenecks and design of interventions will draw on the past work of Cluster 3.2 and results from research outside of PIM. The geographic targeting of interventions will draw on the methodology developed during Phase 1 (Torero 2014). As this systematic assessment of value chains in one country identifies chains within the mandate of AFS CRPs, researchers within the community of practice will reach out to colleagues working in those CRPs and in partner agencies to inform them and seek collaboration. After learning lessons from this first example of comprehensive analysis, the approach will be extended to additional CGIAR countries of collaboration.

The key **outputs** of Cluster 3.2 include:

- **Validated innovations for improving efficiency and inclusiveness of value chains (as shown in Figure 2.3.1.3.1).**
- **Documentation of rigorous evaluations** and guidelines for practitioners based on lessons learned and best practices. Results will be shared across CRPs and with other key stakeholders (including from the private sector) through the value chains portal, the IFPRI/FAO platform on food loss and waste, and the value chain hubs.
- **Improved tools, methods,** and assessment approaches posted on the value chains portal.
- **Comprehensive country-level assessments of the performance of value chains in CGIAR countries of collaboration,** and corresponding strategies for improved efficiency and inclusion.

Work in Cluster 3.2 will be concentrated **around the value chain hubs in Eastern and Southern Africa (Ethiopia, Kenya, Tanzania, Uganda), Western Africa (Ghana, Nigeria, Senegal), and Latin America (the Andean countries, Honduras, Nicaragua).** Through collaboration and co-investment with the AFS CRPs, the Flagship 3 team intends to expand coverage of the tools and methods developed to **South Asia (Bangladesh, India, Nepal), Southeast Asia (Cambodia, Myanmar, Vietnam), Latin America (Bolivia, Colombia, Ecuador, Guatemala, Haiti, Mexico), and North Africa (Morocco, Tunisia).**

### *Cluster 3.3 – Approaches to Value Chain Improvements at Scale*

This cluster provides methodological and practical inputs for guiding the scaling up of interventions successfully piloted under Cluster 3.2, or through programs implemented by development partners.

**Scaling of value chain interventions has received attention in the literature, but rigorous methodological approaches are not yet well developed.** Gillespie et al. (2015) conducted a large-scale literature review, and identified nine factors that are relevant for scaling work on nutrition, including: vision/goal, what is being scaled, context/enabling environment, drivers and barriers, strategies and processes, capacity, governance, finance and monitoring, and learning and accountability. Reviews focused more closely on agriculture (Hartman et al. 2013) find that ideas and models, vision and leadership, external catalysts and incentives, and accountability are needed for scaling to occur. Kherallah et al. (2015) identify three pathways for scaling value chain interventions, including policy engagement, use of project financing, and knowledge generation and sharing. These studies show growing intellectual interest in the topic, but provide little guidance for practitioners. In the absence of such guidance, many development agencies continue to invest in large-scale programs and learn as they go.

**PIM proposes to join with these development agencies, and provide a rigorous basis for learning.** PIM will not embark on scaling efforts on its own; these activities are the domain of key public and private

development partners with a clear remit for value chain intervention. Rather, PIM, in collaboration with AFS CRPs and other partners, will conduct **rigorous research to identify scaling typologies, develop methods for evaluating interventions operating at scale, and document results of what works, where, for whom, and under what conditions.**

**Research questions** include:

- What are the essential characteristics of successful innovations in value chains, and in what contexts do they succeed?
- What determines the pace of adoption of successful interventions, such as new types of contracting, membership in producer organizations, and financial products?
- Which scaling models and mechanisms are particularly effective for particular innovations, and how can they be replicated in or adjusted to different contexts?
- What are the factors that need to be taken into account in terms of behavioral characteristics of households or value chain actors?

Cluster 3.3 researchers will undertake a **detailed literature review** of what is known in terms of scaling up value chain innovations. This will include compilation of multi-country experiences of scaling approaches and results, comparison with initial reviews of existing global practices, and identification of best-bet scaling options. A **typology of potential models for scaling up value chain interventions** will be developed. Two dimensions for models of scaling up are currently recognized: (a) horizontal scaling, which refers to geographical spread and expansion within the same sector, and (b) vertical scaling, that involves other groups within an institutional hierarchy, such as federations of farmers' organizations or innovation platforms. Cluster 3.3 will explore these two dimensions in characterizing scaling up processes to discern pathways (i.e. the sequence of steps to ensure that a successful pilot or practice is taken from its experimental stage to larger scale). Teams will validate scaling up models (that is, apply tested interventions at scales larger than pilots to evaluate how well the move to larger scale succeeds) to identify which approaches are most cost-effective and under which conditions they work.

Testing of approaches to scaling is expensive, since by definition it requires operation at a scale larger than small pilots. **Partnership in the context of large projects already under implementation** provides an opportunity to perform this testing. Implementers of large projects welcome the analytical input, since it can lead to more effective operational work. PIM researchers are already engaged with partners in a Global Agriculture and Food Security Program-funded project with the Government of Honduras, in which a number of value chain interventions have been evaluated through experimental methods. These evaluations can be revisited to discern factors that would either promote or inhibit application at a larger scale, and structured experiments can be undertaken within the implementation of the project. Similar opportunities exist with a South-South learning project between Brazil and Malawi and Senegal, where a modified version of the Brazilian Fomento model of extension with incentives has been tested through RCTs, and with the Program of Accompanying Research for Agricultural Innovation (PARI) in Africa and India as part of the Agricultural Innovation Center's Initiative supported by the German government. The Cluster 3.3 team will discuss possibilities of operational partnership with the implementers of these projects.

In addition to the work described above, teams will apply tools of **behavioral economics** to understand why value chain actors either adopt or reject opportunities offered to them, and to test whether lessons learned by one or several group(s) of participants can be generalized to other groups in order to predict scalability.

The key **outputs** of Cluster 3.3 include:

- **Characteristics of successful innovations in value chains**, with corresponding contexts Framework and methodology to predict the results of scaling up under different conditions.
- **Typology of scaling models**, with contextual information.
- **Scaling strategies validated** and documented with partners.
- **Handbooks and toolkits** reflecting lessons learned and guidance for practitioners.

The location of empirical work on scaling up will depend on agreement with the implementation partners and location of projects under implementation. As noted above, **Honduras, Guatemala, Malawi, Senegal, and India are candidate locations.**

### **2.3.1.7 Partnerships**

PIM's **comparative advantage** derives from the technical competence of the team, the relevance of the work to the CGIAR portfolio, and the unique contribution that Flagship 3 provides (Table 1.0.8.1, Section 1.0.8). The ability of the staff working on trade and value chains to combine quantitative and qualitative approaches is recognized. The PIM team provides methodological leadership in measuring food loss and waste, strategic prioritization of interventions in value chains, and scaling up of interventions. The value chains community of practice is well established, and is strengthening programmatic linkages with the AFS CRPs. The value chains team is uniquely able to work across the commodities and technologies within the CGIAR mandate and provide comparative perspectives; for example, in specific CGIAR countries of collaboration, which crops and livestock products are assisted, and which are taxed? The tools, methods, and analytical results produced are made widely available through training (for example, via the AGRODEP network), dissemination on the value chains portal, and interaction with practitioners through the hubs.

Staff active in Flagship 3 work with a wide array of partners including research and implementation partners, farmers' organizations, stockists and input suppliers, traders and processors, local governmental officials, extension agents, and others. The major partners of each type and their roles are shown in Figure 2.3.1.7.1.

**Engagement with the private sector** is greater in Flagship 3 than in other flagships of PIM (with the exception of Cluster 4.2 on insurance). **Unilever** helps to develop and implement tools to increase the participation of smallholders in value chains. Other private-sector partners include **the Mosaic Company and Novozymes.**

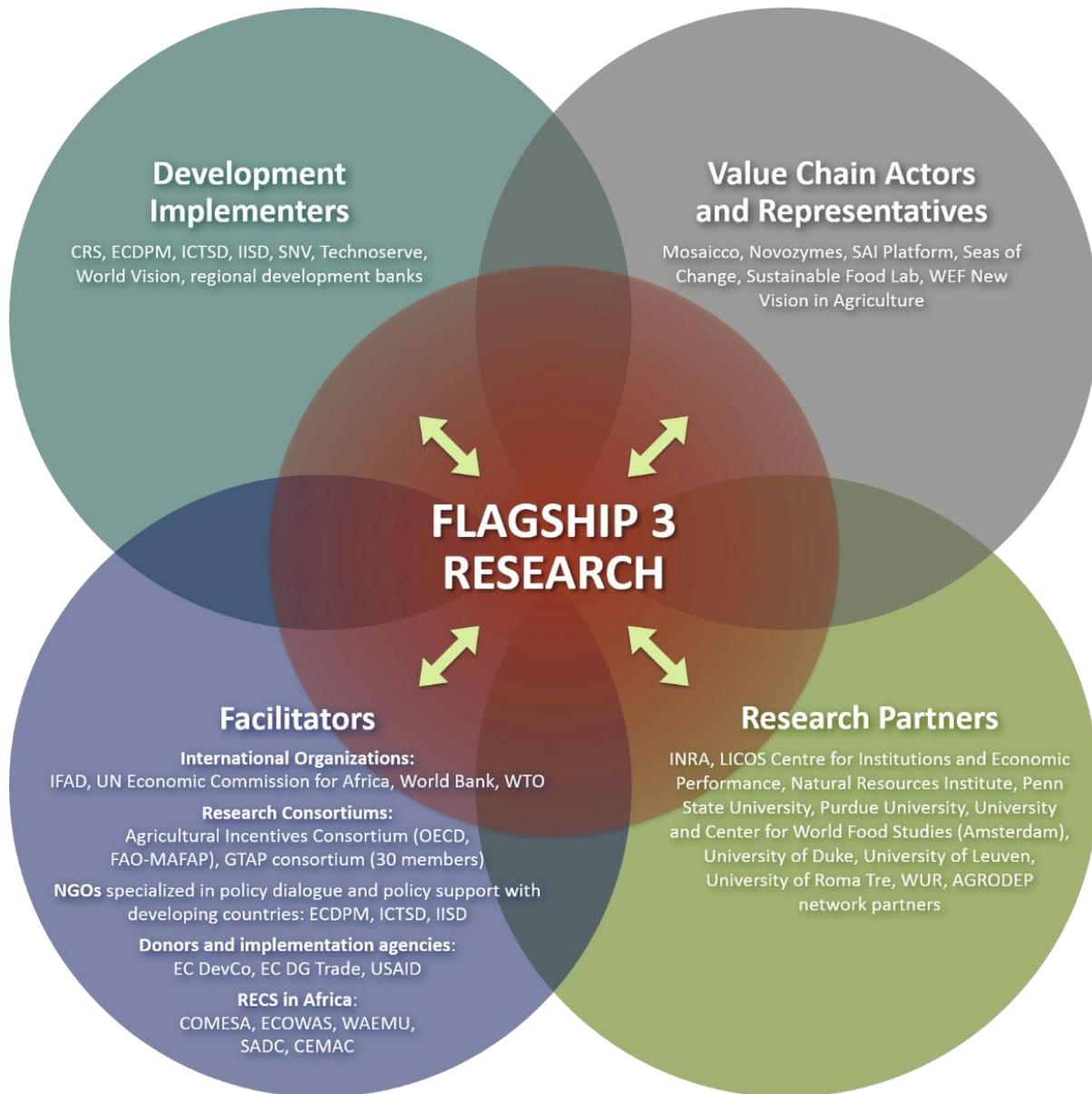
The flagship works with a large number of development organizations – including **Catholic Relief Services, Netherlands Development Organization (SNV), Oxfam, Technoserve, and World Vision International.** The Public Private Partnership-Lab of SNV is an active collaborator on topics related to scaling up.

Collaboration with international organizations increase the global impact of the research. A partnership with **FAO on the technical platform on food loss and waste** has been established, and PIM is part of the **Ag-Incentives Consortium**, working with FAO-MAFAP, IDB, OECD, and the World Bank on the measurement of distortions and strategies for addressing them.

**Wageningen University and Research Centre (WUR)** is a key research partner for Clusters 3.2 and 3.3. WUR has extensive experience across all elements of food system analysis, and expertise linking agriculture and nutrition. Other research partners include Penn State University, Purdue University, and University of Leuven. J-PAL and Duke University will also collaborate on Cluster 3.3.

**The flagship will coordinate research with other CRPs as shown in Table 2.3.1.7.1.** Collaborative work with the AFS CRPs falls into four general categories, with specific agreements for each CRP: diagnosis and remediation for constraints to commercialization of new technologies; measurement of food loss and waste; tools for gender analysis and assessment of opportunities for young people; and new approaches to scaling up. Table 2.3.1.7.1 provides additional detail (see also Annex 3.7).

**Figure 2.3.1.7.1: The different roles of the Flagship 3 partners**



**Table 2.3.1.7.1: Key partnerships with other CRPs**

CRP	Planned collaboration
WHEAT and MAIZE	<ul style="list-style-type: none"> <li>• Trade models to assess demand for wheat and maize as feed</li> <li>• Losses along the value chain, with interest in China, Mexico, and East Africa</li> <li>• Tools for diagnosis and intervention in value chains for wheat and maize</li> <li>• Development and testing of scaling up approaches</li> </ul>
RICE	<ul style="list-style-type: none"> <li>• Assessment of distortions in rice markets and options to reduce them</li> <li>• Losses across the rice value chain</li> <li>• Financing of value chains</li> <li>• Innovations on contract farming and farmer groups to aggregate production and standards</li> <li>• Development and testing of scaling up approaches</li> </ul>
RTB	<ul style="list-style-type: none"> <li>• Postharvest technologies and management options to measure and reduce losses for roots, tubers, and bananas and value-addition to waste products (with RTB Cluster 4.1).</li> <li>• Development and use of tools for gender and youth responsive value chain development (with RTB Cluster 5.3)</li> <li>• Development and testing of scaling approaches (with RTB Cluster 5.4)</li> <li>• Working in the Regional Value Chain Hub in Peru</li> </ul>
DCL	<ul style="list-style-type: none"> <li>• Adaptation of PIM VC tools to DCL value chain contexts (with DCL Clusters 2.1 and 2.2)</li> <li>• Identification of inclusive and efficient options for value chain innovations, including reduction of losses, in targeted grain legume and cereal value chains (with DCL Cluster 2.2)</li> <li>• Identification of appropriate governance and other arrangements for successful scaling (with DCL Cluster 2.3)</li> </ul>
FTA	<ul style="list-style-type: none"> <li>• Value chains tools applied to forest and tree products</li> </ul>
LIVESTOCK	<ul style="list-style-type: none"> <li>• Development of methods specific to livestock value chains, with emphasis on Nicaragua, Uganda, Ethiopia, Tanzania and Vietnam and promotion of tools to prioritize value chain interventions</li> <li>• Losses across the value chain, particularly dairy</li> <li>• Testing organizational innovations to facilitate scaling of livestock market-related innovations, such as hubs to facilitate milk marketing and access to livestock services and technology</li> <li>• Regional Value Chain Hub in Ethiopia</li> </ul>
FISH	<ul style="list-style-type: none"> <li>• Losses along the fish value chain</li> </ul>
CCAFS	<ul style="list-style-type: none"> <li>• Climate-smart value chain approach, with attention to measurement of impact along the value chain of a weather shock at one or several nodes</li> <li>• Development of measures to mitigate shocks in specific nodes and insulate the rest of the chain from adverse impacts</li> </ul>
A4NH	<ul style="list-style-type: none"> <li>• Losses across value chains, including losses due to food safety issues, with emphasis on nutritious value chains</li> <li>• Behavioral issues on consumer demand for nutritious value chains</li> </ul>

### 2.3.1.8 Climate change

Flagship 3 identifies policies that promote constructive response to climate change and shocks. Trade is a crucial instrument for managing global food security in the face of frequent weather shocks. The work on trade models in Flagship 3 (together with work on the IMPACT model in Flagship 1) can **quantify the increased volume of trade under different climate scenarios, and identify the policy measures required to support it.**

**Work on biofuels and land-use** change in Cluster 3.1 examines whether policies intended to mitigate climate change actually do so, and at what cost. Research in this cluster also addresses trends in land use and related emissions. The team studies linkages between the two global frameworks on climate and trade (UN COP, WTO), and assists counterparts from developing countries to understand their implications at country level.

**Successful introduction of climate-smart agriculture requires attention to the full value chain.** Frequent weather shocks and shifting location of production of staples have implications all along the value chain. Similarly, shifts in technologies and management practices introduced in response to climate change require adjustments along the value chain if adoption is to be successful. The PIM team will work with CCAFS on approaches to climate-smart value chains that promote adoption of resilient technologies and cushion the impact of shocks along the chain. In the countries for which the PIM value chains team will undertake a comprehensive assessment of distortions along major value chains, the analysis will include assessment of changes in the value chain required to accommodate introduction of climate-smart techniques and management practices. CCAFS has expressed interest to join in this work, as noted in Table 2.3.1.7.1.

### **2.3.1.9 Gender**

Cluster 3.1 will explore **gender-specific implications of agricultural distortions, trade patterns, and macroeconomic policies**. Under Cluster 3.2, tools have been developed for **gender-sensitive assessment of value chains**, including methods to diagnose segregation in employment and in control of assets across and within households, and at the level of small- and medium-scale enterprises run by smallholders. These tools have been used to design interventions targeting men and women separately, and have been tested in randomized field experiments in Phase 1. They account for assets more controlled by men, assets more controlled by women, and those that are jointly managed. **These tools can be adapted to examine segregation of other identifiable groups, such as youth and specific ethnic groups**, and can reveal potential and actual differences in terms of assets as entry points to value chain development or as outcomes resulting from value chain development. Similarly, they allow researchers to determine foregone benefits resulting from exclusion.

A more rigorous understanding of where women and young people are employed in the different nodes of the value chains, and how different household members engage across value chains, will lead to more inclusive structural transformation, thus contributing to Flagship 2. The value chain hubs are critical for joint learning around development of tools with a gender focus (such as the gendered versions of PMCA, LINK, and 5Capitals). This work will also assist the AFS CRPs in assessing the gender implications of improvements in their commodity value chains and farming systems, thus leading to more inclusion of smallholders, particularly women.

### **2.3.1.10 Capacity development**

Flagship 3 invests in capacity development within CGIAR through its community of practice, and externally through training sessions on use of tools and methods. The capacity development activities in Flagship 3 map to the following elements of the CapDev framework: Learning materials and approaches (Element 2); Gender-sensitive approaches throughout capacity development (Element 5); Institutional strengthening (Element 6); Organizational development (Element 8); Capacity to innovate (Element 10).

Two examples of key capacity strengthening investments are:

- **The value chain hubs.** In Phase 1, three regional value chain hubs were established to connect research, development, and policy actors in learning processes. These hubs build the capacity, including the capacity to innovate, of development actors for better design and implementation

of programs; develop communities of practice of local service providers for monitoring, evaluation and impact assessment; support active engagement with key policy processes; and provide evidence for scaling effective interventions.

- **The AGRODEP Consortium** is a dynamic group of African academics and practitioners (currently 183 members in 29 countries in Africa South of the Sahara) to whom the Flagship 3 team provides innovative training, tools (models and databases), mentoring, research grants, and fellowships opportunities. Training sessions are designed with an understanding of the technical backgrounds of participants, so that complex subjects requiring an array of skills (technical, negotiation strategy, legal issues) can be successfully presented. AGRODEP builds in mentoring, fellowship opportunities, and joint research to grow a critical mass of research leaders across the African continent.

### ***2.3.1.11 Intellectual asset and open access management***

In accordance with the CGIAR guidelines on intellectual asset and open access management, and with the policies of the lead Center and its partners, Flagship 3 will ensure access to its intellectual assets in a manner that encourages access, use, replication, and adaptation of its research while safeguarding the privacy of participants and protecting confidential and proprietary information. CGIAR researchers associated with Flagship 3 will make their data available to other researchers through Center-specific platforms, such as the IFPRI Dataverse platform. Most publications will also be made open access. In addition, all tools and models will be shared through the value chains platform and the value chains hubs (and their linkages with partners and learning alliances). Data provided on a confidential basis in support of negotiations will remain confidential.

### ***2.3.1.12 FP management***

The Flagship 3 management team includes **a flagship leader, and leaders for each of the three clusters.**

**The role of flagship leaders will be expanded in Phase 2 relative to Phase 1**, especially with regards to coordinating inputs from the participants, reporting on flagship-level progress and budget execution, and tracking outcomes and impact. The flagship management team will be funded for one third of FTE for oversight of the flagship. PIM will also cover the cost of a flagship management support function (to help with formulation of annual work plans, tracking of deliverables, and reporting) up to 50% FTE by flagship.

The Phase 1 leader of Flagship 3 has led the preparation process for Phase 2. Flagship leaders for Phase 2 were selected in July, 2016 through a transparent merit-based process. The PIM Management Committee approved TORs for the positions and selection criteria including experience and excellence in the field (as measured through records of ISI publications and evidence of contribution to policy and other PIM outcomes), demonstrated ability to raise funds and attract strong research and implementation partners, and managerial experience. Staff from all Participating Centers and selected external partners were invited to nominate candidates. Self-nominations were allowed. A selection panel consisting of two SPAP members, one external partner, one representative of the Lead Center, and one representative of the PMU assigned scores to the nominees. As a result of this process, Flagship 3 will be co-led by **Erwin Bulte of Wageningen University and Research Centre and Maximo Torero of IFPRI** (CVs in Annex 3.8). Both will serve on the Management Committee, with a shared vote and option to rotate attendance. Cluster leaders will be chosen by September, 2016 through a participatory process led by the appointed flagship leaders.

## 2.3.2 Flagship Budget Narrative

### 2.3.2.1 General information

CRP Name	Policies, Institutions, and Markets
CRP Lead Center	International Food Policy Research Institute
Flagship Name	Flagship 3: Inclusive and Efficient Value Chains
Center location of flagship leader	Wageningen University and Research Centre and IFPRI (co-leadership)

### 2.3.2.2 Summary

Total Flagship budget summary by sources of funding (USD)

Funding Needed	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Total
W1+W2	3,510,000	3,510,000	3,615,300	3,615,300	3,723,759	3,723,759	21,698,118
W3	3,516,459	3,516,459	3,621,953	3,621,953	3,730,612	3,730,612	21,738,050
Bilateral	9,996,308	9,996,308	10,296,197	10,296,197	10,605,083	10,605,083	61,795,177
Other Sources							0
	17,022,767	17,022,767	17,533,450	17,533,450	18,059,454	18,059,454	105,231,345

Funding Secured	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Total
W1+W2 (Assumed Secured)	3,510,000	3,510,000	3,615,300	3,615,300	3,723,759	3,723,759	21,698,118
W3	3,100,142	2,046,093	1,023,046	465,021	0	0	6,634,304
Bilateral	8,257,045	5,449,650	2,724,825	1,238,556	0	0	17,670,077
Other Sources							0
	14,867,187	11,005,743	7,363,171	5,318,877	3,723,759	3,723,759	46,002,499

Funding Gap	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Total
W1+W2 (Required from SO)	0	0	0	0	0	0	0
W3 (Required from FC Members)	-416,317	-1,470,366	-2,598,906	-3,156,932	-3,730,612	-3,730,612	-15,103,746
Bilateral (Fundraising)	-1,739,263	-4,546,658	-7,571,372	-9,057,641	-10,605,083	-10,605,083	-44,125,100
Other Sources (Fundraising)	0	0	0	0	0	0	0
	-2,155,580	-6,017,024	-10,170,279	-12,214,573	-14,335,695	-14,335,695	-59,228,846

## Total Flagship budget by Natural Classifications (USD)

	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Total
Personnel	5,994,789	5,994,789	6,174,633	6,174,633	6,359,871	6,359,868	37,058,586
Travel	1,165,683	1,165,683	1,200,653	1,200,653	1,236,673	1,236,676	7,206,023
Capital Equipment	0	0	0	0	0	0	0
Other Supplies and Services	4,488,796	4,488,796	4,623,459	4,623,459	4,762,164	4,762,164	27,748,840
CGIAR collaborations	0	0	0	0	0	0	0
Non CGIAR Collaborations	3,409,553	3,409,553	3,511,839	3,511,839	3,617,194	3,617,194	21,077,175
Indirect Cost	1,963,945	1,963,945	2,022,864	2,022,864	2,083,550	2,083,550	12,140,721
	17,022,766	17,022,766	17,533,448	17,533,448	18,059,452	18,059,452	105,231,345

## Total Flagship budget by participating partners (signed PPAs) (USD)

	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Total
IFPRI	10,152,767	10,152,768	10,457,350	10,457,350	10,771,071	10,771,070	62,762,379
Biodiversity	630,000	629,999	648,900	648,899	668,367	668,366	3,894,534
CIAT	1,260,000	1,260,000	1,297,799	1,297,799	1,336,734	1,336,733	7,789,068
CIFOR	209,999	209,999	216,299	216,300	222,789	222,789	1,298,178
CIP	1,259,999	1,259,999	1,297,800	1,297,800	1,336,734	1,336,734	7,789,068
ICARDA	420,000	419,999	432,600	432,600	445,578	445,578	2,596,356
ICRAF	630,000	630,000	648,899	648,899	668,367	668,366	3,894,534
ICRISAT	630,000	630,000	648,899	648,900	668,367	668,367	3,894,534
IITA	420,000	420,000	432,599	432,599	445,578	445,578	2,596,356
ILRI	839,999	839,999	865,200	865,200	891,156	891,156	5,192,711
WorldFish	420,000	420,000	432,599	432,599	445,578	445,577	2,596,356
WUR	149,999	149,999	154,500	154,500	159,135	159,135	927,271
	17,022,763	17,022,762	17,533,444	17,533,445	18,059,447	18,059,449	105,231,345

Explanations of these costs in relation to the planned 2022 outcomes

Flagship 3 is the locus of PIM's work on value chains. The flagship addresses the enabling environment (global, regional, and domestic) in which value chains operate (Cluster 3.1), identifies weak nodes in the chains, and designs and tests interventions to strengthen these (Cluster 3.2), and provides insights into how interventions found successful in pilots can be adopted on a larger scale (Cluster 3.3).

In Phase 1, temporary interruptions of spending have been observed in several Participating Centers due to personnel changes and delays in hiring. In such cases, discussions are held between the Program Management Unit and the Participating Center to determine whether the flagship leader should be involved in the hiring process, whether the funding should be reallocated to other activities, etc. Other risks to spending mentioned in the program-level budget narrative apply to Flagship 3.

**2.3.2.3 Additional explanations for certain accounting categories**

**Benefits:** Benefit costs primarily include leave, health, and pension costs. The costs are pooled and allocated over a base consisting of total labor. The benefit pool divided by total labor creates the rate applied to labor. For most partners, the benefit rate used in this budget was the benefit rate for the Lead Center, i.e. 58.5%.

**Other supplies and services:** The “Supplies and services” category represents about 28% of the direct costs. This category includes field surveys; research support; cost-shared services for IT and other; workshops and training, including capacity development, meetings and conferences; editing and publications; miscellaneous charges such as copying and fax; a few partners also include benefits in this category.

### 2.3.2.4 Other sources of funding for this project

The large bilateral/W3 donors for Flagship 3 in Phase 1 are **EC, IFAD, the Inter-American Development Bank, USAID, and the World Bank**. In Phase 2, additional funding will be sought through joint fundraising with AFS CRPs; discussions are under way with foundations.

### 2.3.2.5 Budgeted costs for certain key activities

	Estimate annual average cost (USD)	Please describe main key activities for the applicable categories below, as described in the guidance for full proposal
Gender	4,383,363	See below and flagship narrative
Youth (only for those who have relevant set of activities in this area)	1,702,277	See below and flagship narrative
Capacity development	2,553,415	See below and flagship narrative
Impact assessment	851,138	See below and flagship narrative
Intellectual asset management	0	See below and flagship narrative
Open access and data management	0	See below and flagship narrative
Communication	620,797	See below and flagship narrative

**Gender:** The gender component of Flagship 3 is derived by assigning a gender percentage to each of the Sub-IDOs that the flagship contributes to (see Table C of the Performance Indicators Matrix). For the Sub-IDOs under IDO CC2.1 on Equity and inclusion achieved, the gender percentage is assumed to be 100%. Using this methodology, the Flagship 3 **gender budget for 2017** is estimated at **\$4.4M**, which represents **26%** of the total flagship budget. Key gender activities in Flagship 3 are described in Section 2.3.1.9 of the Flagship 3 narrative.

**Youth:** For this flagship the level of intensity in addressing youth issues is estimated at **10%**, that is **\$1.7M in 2017**. The contribution of Flagship 3 to PIM’s youth strategy is described in Annex 3.5.

**Capacity development:** The capacity development component of Flagship 3 is derived by adding up the flagship contributions to the capacity development Sub-IDOs, i.e. Sub-IDOs CC2.1.1, CC3.1.3, CC4.1.1, and CC4.1.2 (see Table C of the Performance Indicators Matrix). It is assumed that the flagship’s contributions towards other Sub-IDOs do not count as capacity development. Using this methodology, the Flagship 3 **capacity development budget for 2017** is estimated at **\$2.6M**, which represents **14%** of the total Flagship 2 budget.

**Impact assessment:** The impact assessment budget is estimated to be **5%** of the flagship budget, for a total of **\$0.85M in 2017**. Examples of activities counted in this budget are the monitoring by the value chains hubs of the uptake of value chains tools by partners, and evaluations of the effectiveness of value

chains interventions that will be used as part of impact assessment of PIM research.

**Open access and data management:** PIM is fully committed to complying with the CGIAR Open Access and Data Management (OADM) Policy and its Implementation Guidelines. Major infrastructures and staff required to do so are covered through overhead costs charged by the Centers, and include: maintenance of digital content collections; Online Public Access Catalog (OPAC)/library catalog systems; website development related to repositories; promotion and training in support of OA/OD. Additional costs specific to PIM research activities (essentially OA fees for journal articles) are budgeted for at project level under Supplies and Services.

**Intellectual asset management:** As explained in Annex 3.10 of the proposal narrative, the budget for IA management is the same as the budget for OA management (see above).

**Communications:** As described in PIM's Communications Strategy, flagship leaders will appoint a staff member responsible for liaising with the Program Management Unit, participating in the PIM communicators group, and supporting the flagship's communications activities, which include: contributions to the PIM newsletter and blogs; organizing knowledge sharing and capacity building events on the topics of the flagship research; representing PIM at local/regional events; and supporting application of the PIM Branding and Acknowledgement Guidelines at flagship level. It is estimated that these tasks will represent 0.3 FTE of a Communications Specialist, or about \$25K annually per flagship. In addition, Supplies and services include communications-related items, among which publications and workshops; these items are estimated to represent 3.5% of the flagship budget i.e \$596K in 2017. The total is \$621K (3.7% of the total Flagship 3 budget).

### **2.3.2.6 Other**

Please disregard the FTE allocations columns in the budget template (the computation of this item is not appropriate for an aggregated presentation of the personnel costs). The approximate number of FTE (average across years) for this flagship is 26. See Annex 3.8 for the CVs of the core members of the flagship team.

The total time dedicated to the **flagship coordination activities** is estimated at about 30% FTE. Following the guidance in the case when this percentage is below 50%, the corresponding costs are included in the flagship budget. PIM will also cover the cost of a flagship management support function up to 50% FTE by flagship; the corresponding costs are included in the program management costs.

There are no plans to purchase capital equipment.

### 2.3.3 Flagship Uplift Budget

Outcome Description	Amount Needed	W1 + W2 (%)	W3 (%)	Bilateral (%)	Other (%)
Research and development organizations use PIM tools for value chain analysis and development in 4 additional instances in 2 additional countries of CGIAR collaboration (includes capacity development)	2,500,000	100	0	0	0
Evidence is used to support changes in trade policy and/or regulations with global and regional implications in additional 1 instance (includes capacity development)	2,000,000	100	0	0	0
Research and development organizations use PIM tools to address post-harvest losses in 2 additional CGIAR countries of collaboration (includes capacity development)	1,500,000	100	0	0	0
Earnings of smallholder male and female farmers from specific value chains increase by 20% as a result of interventions in these value chains in 1 additional CGIAR country of collaboration (includes capacity development)	2,000,000	100	0	0	0

## 2.4 Flagship 4: Social Protection for Agriculture and Resilience

### 2.4.1 Flagship Project Narrative

#### 2.4.1.1 Rationale, scope

Flagship 4 examines **instruments in the public and private sectors to manage vulnerability and risk, and to build resilience for the rural poor**. Among the public sector instruments are **social protection and safety net programs**, while private sector approaches include various **insurance products and schemes, as well as innovations in delivery of basic financial services to the poor**. The important policy questions for research in this area concern the scale of social protection and agricultural investment in light of budget constraints, and how social protection (including insurance) and agricultural interventions are best integrated to promote rural prosperity and resilience.

Chronic vulnerability and unmanaged risk dampen investment in labor and land, particularly for the poor, leaving valuable human and physical resources underutilized. The resulting poverty is often sustained across generations. Targeted social protection programs (e.g., cash transfers, food rations, public works projects, school feeding programs, and old age pensions) and insurance schemes are the leading instruments to reduce the impact of shocks due to climate change, drought, flood, conflict, and price volatility on poor households. Social protection programs **prevent an estimated 150 million people annually from falling into poverty** (Fiszbein et al. 2013). By reducing distressed sales of productive assets, removing credit constraints, building community assets, and mitigating risks of adopting new agricultural technologies, social protection and insurance programs directly contribute to agricultural development. Whether to invest in agriculture or provide social protection for the rural poor is a false dichotomy (Hoddinott 2008). Nearly all governments do both, although rates of coverage of social assistance in Africa south of the Sahara (at 20 percent of the rural population) and South Asia (at 27 percent of the rural population) are lower than in other regions (FAO 2015).

PIM researchers have an established record of examining the impacts of transfers from social protection programs on agricultural outcomes, including increased use of fertilizer, improved seeds and agricultural credit (Hoddinott et al. 2014; Gilligan et al. 2009); increased investments in land, water harvesting and productive assets (Hoddinott et al. 2012); rural household labor supply (de Brauw et al 2015); and livestock holdings (Berhane et al. 2014; Gilligan and Hoddinott 2007). **In Phase 2, research under Flagship 4 will emphasize linkages between and among social protection, risk management, and agriculture**. Topics will include the impact of public works on agricultural labor supply, the effect of cash and food transfer modalities on food prices, the effects of transfers on women's empowerment and allocation of productive assets within the household, and design of insurance instruments to deepen outreach by private providers to smallholder farmers, both men and women.

Flagship 4 addresses the following **research questions** (discussed at greater length in Section 2.4.1.6):

- **How do social protection programs influence agricultural growth and nutrition**, and what are the implications of this for program design?
- Are there trade-offs between public spending on social protection, agricultural growth, and nutrition? If so, how should these trade-offs be managed?
- How can the **design, delivery, and targeting of social protection** programs be improved to increase complementarities with agricultural and nutritional interventions?
- What features of insurance products do poor smallholders value most, and how can **uptake of insurance** be increased? How does insurance affect the way agricultural producers behave?

Research under PIM's Flagship 4 addresses many of the **grand challenges** identified in the SRF. As **climate change** increases the incidence of shocks, transfer programs may require changes in design and targeting. Transfers through safety nets and new insurance products can be designed to support new **entrepreneurial and job opportunities for the poor**, and to improve human capital investment in **young people**. Research on the potential to improve the nutritional impacts of social protection will continue, in conjunction with A4NH. Building on evidence from Phase 1 showing that household diet and consumption patterns differ for cash and food transfers, research will explore how transfers, on their own or linked to complementary agricultural investments, affect adoption of agricultural technologies and cropping patterns, and may lead to **changing food consumption patterns**. The team will examine the role of **gender** and intrahousehold decision making in shaping the outcomes of programs. Research on insurance will explore how providing access to affordable weather-based insurance products can increase households' capacity to cope with shocks, and how agricultural microinsurance markets enhance market access and technological dynamism of smallholders.

**Social protection research** will continue to focus on **Africa south of the Sahara and South Asia, with particular emphasis on Bangladesh, Ethiopia, and Mali**. Selective involvement in **India** (in collaboration with A4NH) and **Pakistan** will be considered. **Research on insurance** will focus initially on **Bangladesh, India and Ethiopia**, and will explore opportunities in selected other countries in Asia and Africa south of the Sahara, including Senegal, Burkina Faso, Nigeria, Kenya and Tanzania.

Work on insurance is pursued collaboratively with CCAFS and other CRPs (see Annex 3.7). Collaboration on social protection is planned with RTB (on social protection for Andean potato growers) and with CCAFS (on safety net design and financing to improve program responsiveness to the effects of climate change). Both collaborations will be further developed in the second half of 2016.

#### **2.4.1.2 Objectives and targets**

The work of Flagship 4 seeks to **reduce the vulnerability of very poor rural households** (through social protection programs) and to **improve their ability to manage agricultural risks** (through insurance and other financial services). The combination of reduced vulnerability and managed risk will improve the ability of these households to accumulate assets – including human capital – that will allow many to move out of poverty. At higher levels of prosperity they will enjoy a wider array of agricultural and non-agricultural options to manage risk, and in many cases will be able to avoid vulnerability through their own preventive measures.

The research directly addresses the SLOs on **Reduced poverty (SLO 1) and Improved food and nutrition security for health (SLO 2)**, and contributes to a lesser but significant degree to **Improved natural resource systems and ecosystem services (SLO 3)**. Table 2.4.1.2.1 shows the main contributions of Flagship 4 to Sub-IDOs. Because of the **increased attention to linkages between social protection and agriculture in Phase 2**, several Sub-IDOs related to increased productivity and enhancement of natural capital are targeted. For example, social protection programs can allow smallholders to adopt profitable agricultural technologies and management practices that entail higher risk. Poor families protected from weather shocks and price spikes can rely more on markets for sales and purchases of food than they might without protection. Social protection and insurance thus contribute to increased commercial engagement of poor smallholders. Social protection can reduce distress sales of productive assets in response to shocks, thereby preserving the capital base for smallholder production. Regular cash payments, even if small, can alleviate credit constraints and fund input purchases. Through public works included in many social protection programs, agriculturally relevant community assets and soil conservation measures can

be funded. These agricultural outcomes are in addition to the reduced vulnerability and protection against consumption shocks that are usually the main objectives and outcomes of social protection.

Together with Flagship 2, work under Flagship 4 also examines appropriate levels of government spending for social protection, thereby contributing to annual budget discussions and formulation of Medium Term Expenditure Frameworks in countries of CGIAR collaboration.

The work on insurance is intended to increase coverage of smallholders with instruments that suit their needs, delivered by private insurance firms at prices farmers are willing to pay. Poor uninsured smallholder farmers face higher unmanaged risk than do their less poor counterparts, are constrained in their managerial decisions, and experience recurrent reminders of their disempowerment as they are buffeted by shocks. Research on insurance in PIM seeks new insights into why uptake of insurance by the poor is so low, and how to overcome the barriers. An additional outcome will be better understanding of how the public and private sectors can work together to facilitate expansion of insurance coverage. Insurance products are often subsidized, but the rationale for subsidies in very poor countries is not well-developed. Whether and how subsidies should be set, and whether they should be targeted or generalized are important policy issues with clear political economy dimensions to be examined together with the methodologies of Flagship 2.

**Table 2.4.1.2.1: Contributions of Flagship 4 to the CGIAR Sub-IDOs**

Sub-IDOs	Relative contribution (%)
1.1.1 Increased capacity of households to cope with shocks	20
1.2.1 Improved access to financial and other services	10
1.4.5 Increased access to productive assets, including natural resources	15
2.1.2 Increased access to diverse nutrient rich foods	20
CC2.1.1 Gender equitable control of productive assets and resources	10
CC2.1.3 Improved capacity of women and young people to participate in decision-making	5
CC3.1.4 Conducive environment for managing shocks and vulnerability, as evidenced in rapid response mechanisms	10
CC4.1.1 Enhanced institutional capacity of partner research organizations	5
CC4.1.2 Enhanced individual capacity in partner research organizations through training and exchange	5
Total	100

**Specific outcomes of Flagship 4** include:

- **The capacity of national organizations in designing cost-effective social protection programs and in conducting research on social protection is strengthened.**
- **National social protection programs and policies are improved** to increase resilience of the poor. **Integration of social protection programs with agriculture and nutrition programs is improved to enhance the impacts of social protection.** Coverage of well-targeted social protection programs increases among underserved populations, and the size of programs expands and contracts appropriately in response to shocks. It is expected that in 2022 national social protection programs and policies will be modified based on evidence in 4 countries,

including three CGIAR countries of collaboration.

- **Improved social protection innovations provide food and nutrition benefits** to poor households. Social protection programs empower women to change family diets and increase complementary health inputs, thereby improving nutrition, especially for children. It is expected that in 2022 at least three countries will benefit from these effects.
- **New insurance products are used by smallholder farmers.** Insurance providers pilot and market new products to accommodate varying needs of smallholders, and expand coverage into previously underserved markets. It is expected that in 2022 new insurance products will be used in 3 countries, including two CGIAR countries of collaboration.

**The Flagship 4 team works closely with A4NH (on nutrition) and CCAFS (on insurance), and with PIM Flagships 2 (on public expenditure), 3 (on value chains), 5 (on natural resource management), and 6 (on gender).** With the increased focus on complementarity of social protection and agricultural growth, links with Flagship 1 will be strengthened in Phase 2. The potential for social protection programs to build job skills for young people (Flagship 2) will be explored. The impact of land tenure on effectiveness of investments in land improvement through safety nets will be explored jointly with Flagship 5.

#### ***2.4.1.3 Impact pathway and theory of change (for each individual FP)***

**Two theories of change** (reflecting the dominant role of the public sector in social protection and of the private sector in insurance) underlie the selection of activities pursued in Flagship 4. **The first relates to work on social protection**, and is predicated on the assumption that national governments and their development partners recognize obligations to address vulnerability, both chronic and episodic, and seek advice on how best to do so cost-effectively and without incurring undesired consequences. Research is undertaken to address the practical questions that national counterparts and donor agencies face in design and dimensioning of programs. Research results are then discussed with governments, and embedded in program design and policy change. **The theory of change underlying work on insurance** assumes that smallholder farmers are willing to insure against risk, and private insurers are willing to accept them as clients. The research is framed to explore options for design of mutually beneficial instruments, and to quantify the benefits from increased coverage of insurance. The major agents of change will be private firms and private purchasers of insurance, with complementary influence of public employees if subsidies or regulatory changes are included. Both theories of change are subsets of the general theory presented in Figure 1.0.3.1, with emphasis on program design as the primary mechanism of influence.

Impact pathways for Flagship 4 are shown in Figure 2.4.1.3.1. **Impact of the social protection work is achieved largely through influencing decisions of public officials responsible for design, implementation, and funding of national programs.** Researchers in Flagship 4 have a substantial track record in using evidence from their research on social protection programs to provide advice on program adjustments subsequently implemented at scale. **Impact of the work on insurance is achieved largely through influence over the decisions of private actors**, both suppliers and demanders of insurance products. Capacity development in evaluation of social protection interventions forms a third pathway through which a widening circle of researchers provide evidence informing policies and programs. An active partnership with relevant national counterparts is essential to assure receptivity to research results. For example, in Ethiopia and Bangladesh, key policy makers responsible for periodic review of large scale social protection programs have advisory roles that shape the research questions, analyses and products. Governments are often concerned with how transferred resources are being used by beneficiary

households. PIM-funded research has shown that gender dynamics in the household have strong implications for how transfers are used; whether for expenditures on food, healthcare, schooling, agriculture, or other activities (Gilligan et al. 2014; Roy et al. 2015; Hidrobo et al. 2016; Hidrobo and Fernald 2013). Findings related to these and other specific questions can be reflected in program design (and are addressed in the box “Governments’ knowledge of design of social protection programs” in Figure 2.4.1.3.1).

Development partners are important constituencies for research results on social protection. For example, the World Food Programme (WFP) has used the results of PIM-supported research to select instruments for delivery of benefits within their programs (Hidrobo et al. 2014). This was made possible by a strong and lasting partnership between IFPRI and WFP. PIM is currently discussing a partnership with World Vision International, a managing partner of PIM and another major implementer of safety net programs. In Ethiopia, PIM researchers inform a donor task force contributing funding to the Productive Safety Net Programme (PSNP), including representatives from DFID, the EU, USAID, and the World Bank. Work with development partners has features of public goods, since lessons can be applied in other countries and regions when relevant.

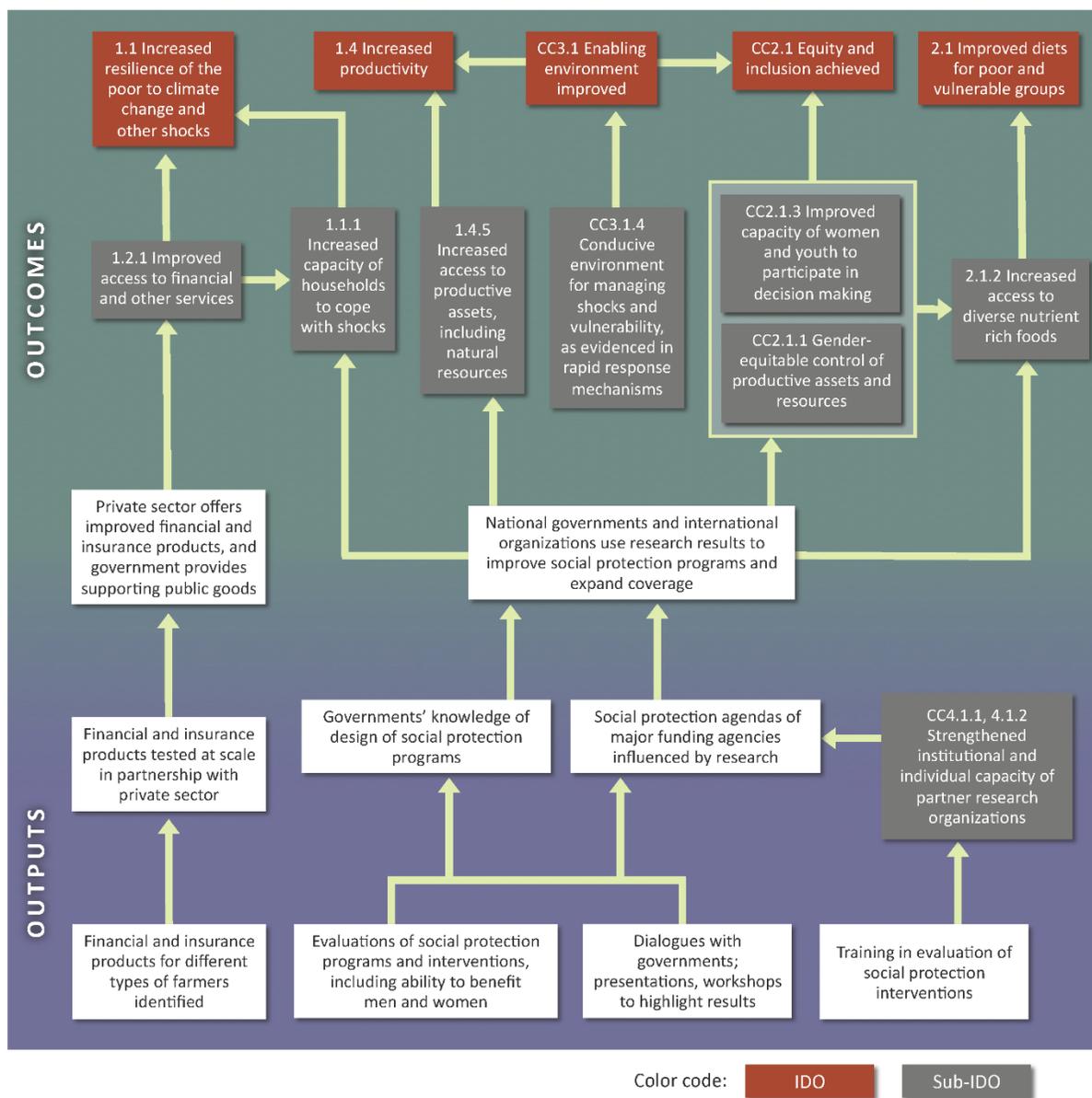
Governments and other implementers are sometimes sensitive to the findings of evaluations and how these findings are made public, especially if they are less favorable than expected. In recognition of this, PIM researchers craft the research agenda carefully, often combining elements of learning from the past with testing of new options.

The incorporation of research results into program design and implementation is followed by outcomes at the level of covered individuals and households: better ability to cope with shocks, invest in productive assets, diversify and maintain diets, and invest in children’s health and nutrition; and improved gender equity.

Research on **insurance** starts with work to identify the needs and preferences of smallholder farmers (women and men, poor and non-poor, young and old) for different types of products. This research is often done in consultation with private firms and potential clients, to ensure that relevant questions are asked. Research results lead to design and testing of new products, again in collaboration with private firms. Key questions relate to pricing, degree of subsidy, design of the instrument in relation to actual risks as farmers perceive them, and trust that payment will be made if the adverse event occurs.

Firms use research results to design products that improve access to insurance and increase resilience. Research is also done in consultation with governments, who play a key role in agricultural microinsurance markets. Governments provide the necessary infrastructure (network of weather stations and agricultural statistics), and develop regulations of the insurance industry to allow for non-traditional products. Governments also fund research on pilot programs to expand the evidence base, provide subsidies to increase demand, combine insurance programs with other programs (credit, inputs, etc.), and in some cases run large catastrophic insurance programs to protect the poorest of the poor. In India, working closely with national and state governments is essential to influence the national insurance scheme, which reaches millions of farmers and makes insurance mandatory for farmers who take government loans.

Figure 2.4.1.3.1: Impact pathways for Flagship 4



### 2.4.1.4 Science quality

Science quality in Flagship 4 is assured through staffing by a highly regarded team of CGIAR researchers, regular interaction with national counterparts to assure relevance of the research, and publication in ISI journals. **The IFPRI team working on social protection** is considered a leading research group and provider of impact evaluation services in this area. IFPRI's strong reputation for research on social protection is built on **extensive experience in conducting rigorous impact evaluations of social protection programs in 17 countries**. A recent review of social protection research at IFPRI covering the period 2000-2012, commissioned by IFPRI and PIM (Nelson et al. 2015), noted the substantial contributions of this work (350 IFPRI research products, including 67 peer-reviewed journal articles in 2000-2012). High-quality work continued during Phase 1 of PIM. IFPRI impact evaluations have led to 68 publications registered in the [Impact Evaluation Repository at the International Initiative on Impact Evaluation \(3ie\)](#). IFPRI's research

includes **influential evaluations of some of the world's largest conditional cash transfer programs**, such as PROGRESA in Mexico, *Bolsa Família* in Brazil, the Productive Safety Net Programme in Ethiopia, and the Child Support Grant in South Africa. The PIM Flagship 4 team is one of only a few worldwide with the experience and commitment to evaluate large social protection programs operating at scale. Evaluations are designed as learning exercises to provide an understanding of the underlying economic behavior and constraints that shape impact, and use **innovations** including behavioral economics (Hoel et al. 2016) and [unique applications of evaluation methodology](#). The team also has extensive experience with rigorously designed randomized control trials.

The tradition of methodological rigor and innovation will continue in Phase 2. Few organizations can rival CGIAR for simultaneous depth of research capacity in social protection, agriculture, and natural resource management. Previous studies by PIM researchers have demonstrated the capacity to conduct primary research on the linkages between social protection and agriculture (de Brauw et al. 2015; Berhane et al. 2014; Hoddinott et al. 2014; Hoddinott et al. 2012; Gilligan et al. 2009; Gilligan and Hoddinott 2007). PIM proposes to expand this area of research in Phase 2. Opportunities will be explored to increase **the complementarity of PIM's social protection work with research in other CRPs on livelihood systems and resilience to shocks** to agricultural income. Linkages in this area are not yet well developed, but show potential. For example, work in 2015-2016 has begun to examine the impact of social protection on agriculture in Bangladesh, Ethiopia, and Niger. Studies on the complementarity of social protection and agricultural programs are under discussion with agronomists from CIAT and CIP, and considered as a potential co-investment with RTB. Similarly, complementarity of social protection and nutrition programs is being examined in ongoing projects in Bangladesh, Ethiopia, and Mali, in collaboration with A4NH. Evidence on the impact of social protection on child nutrition is limited, but it suggests weak effects (Ruel and Alderman 2013; Alderman 2015; Sahn 2015). Confirmation of this finding will be significant, as will be an understanding of why this is the case.

The team's work on instruments of social protection requires **analysis of the demand side** of food systems. For example, if beneficiaries of programs are to be given cash instead of food, analysis of efficacy requires an understanding of how they will spend the cash. Work on the demand side exhibits the rigor and quality noted in the PIM evaluation, and is not duplicated elsewhere within CGIAR. The work is of value to A4NH (and has been used during Phase 1) and to the AFS CRPs (where it has up to now been underutilized). Efforts to increase connections with AFS CRPs on analysis of demand will be increased in Phase 2.

Impact evaluations of interventions focus on the primary outcomes on vulnerability, as well as cost-effectiveness of the interventions (Margolies and Hoddinott 2014). The emphasis on cost-effectiveness, which includes detailed analysis of project budgets in order to understand which treatment intervention has the largest impact per dollar spent, will continue in Phase 2.

PIM's research on **insurance** in Phase 2 will focus on India and Bangladesh, **where work jointly with CCAFS brings together the requisite constellation of farmers, insurance providers, governments, and donors**. PIM researchers published several high-quality papers on insurance and microfinance during Phase 1, and the emphasis on publication will continue in Phase 2. The team has been strengthened through addition of a senior scholar from outside CGIAR (see appended CVs).

The team will examine the feasibility of **using new technologies and remote sensing images** (geo-referenced pictures, unmanned aerial vehicles, and satellites) to **introduce on-farm loss verification, and hence** minimize basis risk (that is, the risk that the index on which the insurance payment is based does

not accurately reflect the actual loss in a farmer's field). Innovative methods using time series of high-resolution images and algorithms tracking normal crop phenology development will be used to evaluate losses and trigger insurance compensation to farmers. One option already under study in partnership with George Washington University is to rely on machine learning methods to predict deviations from normal phenological development. The team will generate large datasets of time series images, which will be labeled by agricultural experts and used to remotely identify the occurrence of adverse events. The insurance team will work jointly with CCAFS on products incorporating periodic crop pictures taken by farmers, using smart-phones and phone applications developed for this purpose. As shown by focus group discussions with farmers in India, farmers' trust in insurance products increases when they participate directly in the process of verification of loss and decisions on compensation. The team will continue to explore whether engaging farmers in this process increases demand for insurance. Within studies of design features to reduce basis risk, the impact of insurance coverage on farmers' behavior will be assessed.

#### **2.4.1.5 Lessons learnt and unintended consequences**

**IFPRI's impact evaluation of Brazil's Bolsa Familia program** showed that (a) transfers from the program had no disincentive effects on household labor supply, but caused a reallocation of household labor toward work in the informal sector (de Brauw et al. 2015a); (b) the program had significant impacts on women's decision-making power, but gains were concentrated in urban areas (de Brauw et al. 2014); and (c) the program improved school participation and grade progression for girls, but not for boys (de Brauw et al. 2015b). Research in Phase 2 will expand on some of these lessons in countries where Flagship 4 will be active. For example, research will examine whether the absence of labor disincentives from cash transfers also holds for public works programs targeted to the lean agricultural season, and how context-specific the impact of social protection on women's empowerment is.

A multi-country randomized study for the World Food Programme **compared cash and food transfer modalities in Ecuador, Niger, Uganda, and Yemen**. Results from Ecuador (which included food vouchers) found that all three modalities increased food consumption, with food transfers leading to larger increases in calories consumed and food vouchers leading to larger increases in dietary diversity (Hidrobo et al. 2014). These findings are of potential importance for the AFS CRPs contributing most to dietary diversity (DCL, FISH, and LIVESTOCK) in locations with social protection programs. An important area of research in Phase 2 focuses on how providing nutrition messages or access to planting materials for nutrient-dense foods for kitchen gardens along with transfers affects diet quality.

**Evaluation of the PSNP in Ethiopia** found that regular participants in the program benefited from improved food security and increased livestock holdings (Berhane et al. 2014), and that PSNP beneficiaries who also received additional agricultural support had increased use of fertilizer, improved seeds and agricultural credit (Hoddinott et al. 2014), and increased investments in land, water harvesting, and productive assets (Hoddinott et al. 2012).

The ability to increase and maintain livestock numbers has implications for soil fertility and farming systems, which will be explored in Phase 2. Evaluation of the performance of the PSNP under the severe drought of 2015-2016 will be of paramount interest to the Government of Ethiopia and development partners.

Research from Phase 1 reveals occasional **unintended consequences of social protection programs**. For example, a study of the BRAC (former *Bangladesh Rural Advancement Committee*) "Targeting the Ultra

Poor Program” in Bangladesh showed that livestock transferred to women increased their asset ownership, but reduced their mobility and control over income (Roy et al. 2015).

Research on insurance has confirmed that **traditional agricultural indemnity insurance has failed to expand successfully in developing countries** (Ceballos and Robles 2014). Although there are many reasons for such failure, fundamentally they reflect difficulty in designing products that address the risks that poor farmers face at prices they are willing to pay. In light of these findings, continued efforts are required to identify simple and flexible insurance products that will improve take-up by farmers and attract insurance providers. Research in Phase 2 will explore use of new technology to allow low-cost verification of actual losses in farmers’ fields (and hence reduce basis risk), and involvement of farmers in verification to increase trust in the relationship with providers.

**Several lines of work pursued in Phase 1 will not be continued, or will be refocused, in Phase 2.** The work of ICRISAT on India’s major social protection programs within PIM did not generate the desired flow of publications; research on India’s programs will be refocused taking into account changes in staffing and social science priorities in ICRISAT. PIM’s work on poverty and vulnerability in conflict-prone countries is highly regarded, but will not be continued due to selectivity. Conflict is a large topic, and PIM does not have a critical mass of effort in this area.

#### **2.4.1.6 Clusters of activity (CoA)**

Flagship 4 includes two clusters. **Cluster 4.1 on Social Protection Delivery and Outcomes** builds on past PIM research on modalities of delivery of social protection programs, and adds attention to the impacts of social protection on agriculture and nutrition, and the trade-offs associated with the fiscal costs of social protection programs. **Cluster 4.2 on Agricultural Insurance and Risk Management for the Poor** includes research on the design of insurance products to increase their take-up and effectiveness, and examination of the impact of insurance on agricultural production.

##### *Cluster 4.1 – Social Protection Delivery and Outcomes*

This cluster addresses four main **research questions**:

- **How do social protection programs influence agricultural growth?** Can program design (of either social protection or agricultural programs, or both) be adjusted to increase complementarity?
- How can the **design, delivery, and targeting of social protection** programs be improved to increase complementarities with agricultural and nutrition interventions in order to improve cost effectiveness and increase impacts on poverty, agricultural growth, natural resource management, and nutrition? What are effective approaches to providing social protection in humanitarian crises, including those occasioned by weather shocks or conflict, and how can social protection in these settings be modified to improve agricultural development outcomes?
- **What impact do social protection programs have on nutrition**, particularly for children, and how can that impact be enhanced? (joint with A4NH)
- What motivates countries to increase investment in social protection, and what are the **trade-offs between public spending on social protection and on agricultural growth**?

**Social protection programs may affect agricultural outcomes in a variety of ways.** The relationship between social protection and agriculture is examined in the recent FAO State of Food and Agriculture (SOFA) 2015 Report devoted to the topic, to which IFPRI researchers working under PIM contributed two background papers (Hidrobo et al. 2015a, 2015b). Social protection programs can protect household assets (Boone et al. 2013), and improve agricultural productivity (Hoddinott et al. 2012) and land and water management (Todd, Winters, and Hertz 2010). Sadoulet, de Janvry and Davis (2001), and Gertler, Martinez and Rubio-Codina (2012) show that social protection programs that target increased agricultural investment and productive assets create multiplier effects on household consumption in the range of 1.5-2.5. Other evidence points to the complexity of effects of social protection programs on household labor allocation and investment decisions. In some cases, social protection stimulates exit from agriculture (Blattman, Fiala and Martinez 2013); in others, programs increase seasonal migration (Bryan, Chowdhury and Mobarak 2014); while in yet other cases social protection facilitates retention of labor in rural areas (Jayne et al. 2013).

**The interaction between social protection and agricultural production is particularly important in Africa south of the Sahara,** where social protection programs are increasing in number and scope, and where poverty is deepest. As noted in the discussion of the poverty gap in Section 1.0.1 of the program-level narrative, the gap is greatest in rural Africa south of the Sahara. The annual poverty line (at \$1.25 per day) is \$456.25, and the average rural poor resident of Africa south of the Sahara is \$85 away from the line, compared to just \$9 in rural East Asia and the Pacific (Nin-Pratt, personal correspondence, 2016). Bridging this very large gap will require both social protection and agricultural growth, since neither alone is likely to deliver the magnitude of benefits required to do so.

Research under Cluster 4.1 in Phase 2 will provide **new evidence on interactions between social protection and agricultural production by returning to existing household panel datasets from Phase 1 evaluations of programs in Bangladesh and Ethiopia to estimate their impact on agricultural productivity and adoption of technology.** Researchers will also develop new projects to experiment with improved designs of complementary social protection and agricultural interventions. This relatively new area of research draws lessons from the evolution of work on social protection and educational outcomes (Barrera-Osorio et al. 2011). Productive safety net programs like the Ethiopian PSNP, that target public works programs outside the agricultural season, provide a model with features similar to those tried in education (McCord and Slater, 2009). The productive elements of the safety net program have not been as fully researched as other dimensions, and examination of this issue is very timely.

Work on designing social protection programs for agriculture will explore modalities suitable for different target groups. For example, varying the timing of payments and subsidies has been shown to influence demand for fertilizer, and could be included in a social protection program offering cash payments (Duflo, Kremer and Robinson 2011). This “nudge” design, which innovates on the timing of the discount offer, is likely more cost-effective than a traditional fertilizer subsidy, and could be implemented through social protection payments. Yet other approaches to combining social protection and agriculture, such as using labor mobilized for public works on private land of program beneficiaries (for land improvement or tree planting, for example) could be tested. Several aspects of the effect of public works on household labor supply, including in agriculture, will be explored. New research on Phase 4 of the PSNP in Ethiopia will estimate the impact of participation in public works on labor supply in agriculture. Prior research by the PIM team (Gilligan et al. 2009) found that participation in public works in the PSNP reduced school participation and increased child labor for girls age 6-10, with negative intergenerational consequences for nutrition given the importance of maternal education for child nutrition. The team will revisit the issue of child labor, and assess the impact of changes in program design to address it. Combining social

protection transfers with agricultural training, particularly for young people (the subject of a recent bilateral funding proposal by the PIM team), can also be explored, since training without transfers tends to have weak impacts (Blattman and Rallston 2015). Work on social protection and youth employment will be coordinated with the teams working on youth employment in Flagship 2. Other research on the design and delivery of social protection will examine the effect of cash and food transfers on food prices. Cash transfers can increase food prices by increasing demand, while food transfers tend to reduce food prices for transferred products, with possible negative consequences for farmers. Evidence of such effects is limited (see Cunha, de Giorgi and Jayachandran 2011); this issue will be studied using data from the cash-food-voucher modality experiments conducted by PIM in Bangladesh, Ecuador, Uganda, and Yemen in Phase 1. Other research on program designs will explore strategies to improve food security in humanitarian crises.

PIM's work on social protection has consistently emphasized **gender**, and the proposed research will continue to do so. Women provide substantial amounts of labor on both male- and female-controlled household plots in Africa, and often specialize in growing crops for home consumption. Transfer programs in Bangladesh that explicitly target women for transfers intended for agricultural investment may offer experience relevant for Africa. The effects of these programs on women's time use and control over resources as well as on household diets and child nutrition outcomes will be explored. PIM research in Phase 1 showed that social protection programs improve women's empowerment and reduce conflict between partners within the household (Hidrobo et al. 2016). Research in Phase 2 will examine whether these effects lead to more equitable use of productive assets within households, including land.

Past reviews of social protection research have found limited or uneven impacts on nutritional status (Ruel and Alderman 2013; Fiszbein and Schady 2009). Governments in Africa south of the Sahara and South Asia increasingly expect that social protection expenditures improve nutritional outcomes. This has led to a recent shift in social protection programming, to develop explicit links to complementary nutrition and health interventions. The PIM research team (in close collaboration with A4NH) has several **evaluations of nutrition-sensitive social protection programs** underway, including some with complementary nutrition interventions, in Bangladesh, Ethiopia and Mali. One such program is the Transfer Modality Research Initiative (TMRI) in Bangladesh. In partnership with WFP, this randomized control trial compares cash transfers and food transfers, as well as cash + food transfers, with and without nutrition behavior change communication (BCC), to learn which combination of interventions is most effective. Early results have drawn substantial media attention, including in a prominently-featured editorial in *The Daily Star* (the largest circulated English daily newspaper in Bangladesh). Phase 2 research will explore how to enhance and scale these results, including in Ethiopia and Mali.

The trend of increased public expenditure on social protection in many developing countries is observed at a time when public expenditure in agriculture is stagnating (Alderman 2015). This raises questions about the portfolio of public investment for reducing poverty and promoting rural income growth, which will be examined together with Flagship 2, looking at **trade-offs in public spending when both social protection and agricultural public goods and services must find space in budgets**. Analysis on this topic will explore how spending on programs for agriculture and for social protection affects poverty reduction, and whether coordination can increase complementarity between and among programs.

#### *Cluster 4.2 – Agricultural Insurance and Risk Management for the Poor*

Cluster 4.2 will **initially focus on insurance. In later years of Phase 2, the scope may broaden to include other financial services, depending on interest of partners and availability of funding.**

This cluster of activity addresses the following **research questions**:

- What features of insurance products do poor smallholders value most, and **how can products be designed to trigger wide uptake?** At what price can providers offer such products?
- Can **new technologies and remote sensing images (geo-referenced pictures, unmanned aerial vehicles, and satellites)** sufficiently reduce the cost of reliable verification of on-farm losses to allow insurance products not based on indexes to expand (and in this way address the high basis risk of indexes)?
- To which extent can **farmers' involvement in verification of losses and decisions on compensation increase their trust in insurance providers**, and hence uptake of insurance?
- **How does insurance affect the way agricultural producers behave?**

Efforts to address the insurance needs of poor smallholders have a long history, and a record of mixed success. Early products that required verification of losses in farmers' fields foundered on the high costs of verification relative to payouts. The products were too expensive to attract buyers at market rates, and the level of subsidy required to make them marketable was too high to justify public intervention. Index-based insurance instruments, such as weather insurance, offer alternatives that do not require on-farm verification of loss, and these have had success in some parts of the world. In many places, however, and particularly where weather patterns are highly variable spatially and weather stations sparse, weather insurance has not been successful. In these cases, basis risk (that is, the risk that the index on which the insurance payment is based does not accurately reflect the actual loss in a farmer's field) is high. Farmers risk paying for insurance that will not help if a drought or flood hits their fields but bypasses the weather station, which is bound to increase their scepticism about insurance. Weather insurance products have also been difficult for farmers to understand, and considerable effort has gone into designing instruments that are simple and intuitively appealing. The problem of sparse weather stations is greatest in places where insurance coverage is lowest, and the investments needed to update the meteorological stations will take time. **Approaches other than index-based weather insurance are thus of interest in places where index-based insurance alone is not likely to succeed.** The team will explore new technologies and approaches to reduce the cost of on-farm verification that can be used in combination with indexes to provide appealing insurance products. In addition, insuring risks other than yield, such as changes in earnings due to adverse movements of input and output prices, will be examined in conjunction with efforts to increase outreach of financial services.

In a continued effort to help insurance companies and smallholder farmers find mutually attractive products, researchers will **test features of insurance products in India and Bangladesh through experimental auctions with a heterogeneous group of farmers**, including a large sample of women. The work will probe farmers' willingness to pay for different features, such as simplicity of the product and farmers' capacity to understand it, the level of basis risk and coverage of other production risks beyond weather risks, and how the sum insured relates to income forgone or production cost, and premium payment options. Experimental auctions reveal participants' true willingness-to-pay, and they have the capacity to test several features or treatment arms based on actual decisions made by farmers. The team will work closely with insurance companies in designing the products to be tested, thereby benefitting from the private firms' knowledge of marketing, delivery channels, and timing of release of new products. The auctions will be followed by field experiments involving private insurance providers to offer products for the identified target groups and evaluate take-up.

**New technologies will be applied to address the high costs of verification of actual loss.** Remote sensing technologies (such as geo-referenced pictures, unmanned aerial vehicles, and satellites) will be explored. Researchers will partner with CCAFS' Climate-Smart Village project and George Washington University to apply machine learning algorithms to crop images to predict crop losses. Crop experts from CIMMYT and IRRI will contribute to labelling high-resolution imagery. The team will then design specific products and use experimental auctions to evaluate acceptance among farmers and private insurance providers. The contribution of crop biometrics to measurement of crop losses has potential application to insurance and agronomic assessment more broadly.

In a related effort, **CCAFS and PIM will collaborate to engage farmers in the verification of loss and decisions on compensation** to increase trust and willingness to buy insurance. Farmers will take geo-referenced pictures through mobile applications, and use the images to assess crop losses and trigger compensations. Once optimal protocols have been developed, experimental auctions will be undertaken to evaluate the extent to which farmers' direct involvement increases uptake of insurance products. CCAFS and PIM will work together to understand whether and how insurance products can influence farmers' adoption of climate-smart technologies and practices.

Phase 2 research will explore **the impact of adoption of insurance on agricultural production**. Within the pilots in India and Bangladesh, farm-level management and decision making will be compared between covered and uncovered farmers. Current work in Ethiopia will be continued. As resources permit, analysis of agricultural insurance will expand into Senegal and Burkina Faso. Analysis of rural health insurance undertaken with local collaborators in Nigeria, Kenya, and Tanzania will be expanded to explore agricultural products. Increased use of insurance due to the influence of research in Cluster 4.2 is expected to result in higher use of improved seeds, more intensive use of fertilizer, and adoption of climate-smart technologies such as zero tillage and residue management.

#### **2.4.1.7 Partnerships**

PIM's **comparative advantage** in Flagship 4 derives from the technical competence of the research team, the relevance of the work to the SLOs and the portfolio of CRPs, and the unique contribution that Flagship 4 provides in conjunction with other partners.

The team includes highly respected leaders in their respective fields. Both social protection and insurance are relevant to the objectives of CGIAR. Social protection contributes to the IDO addressing resilience against shocks, and, through it, to the SLO on poverty. Insurance contributes both to resilience and to increased productivity. Due to linkage effects (examined in Flagship 2), in many poor rural communities a dollar of uncovered loss in agricultural income generates an additional dollar of loss in off-farm earnings, thereby magnifying uncovered agricultural shocks. Recognition of the relevance of social protection and insurance for CGIAR and the SDGs more generally can be seen in the prominence accorded to resilience in the agenda of development assistance in recent years. Safety nets and insurance are core instruments to enhance resilience. PIM's research team brings unique **ability to probe the complementarity of insurance, social protection, and agricultural production**. Specifically with regard to social protection, few other entities that conduct rigorous research on social protection programs have comparable expertise on agricultural production. For that reason FAO drew heavily on work within PIM for compiling the 2015 State of Food and Agriculture Report, "Social protection and agriculture: breaking the cycle of rural poverty."

PIM researchers work closely with **national partners**, such as the technical unit of the “Projet d'Urgence des Filets Sociaux du Mali (Jigiséméjiri)” (Emergency Safety Nets Project) and the Ethiopian government’s Food Security Coordination Bureau, which is responsible for implementation of the Productive Safety Net Program (PSNP). In Bangladesh, PIM researchers have an MOU directly with the Secretary of the Economic Relations Division of the Ministry of Finance, and also work with several other ministries.

**Research partners** include the Centre for Social Protection, Institute for Development Studies (IDS) at the **University of Sussex**, the Dyson School of Applied Economics and Management at **Cornell University**, and **George Washington University**.

**Implementation partners** include **WFP and other UN agencies (FAO, UNICEF)**. Another important partner on social protection is **DFID**, with whom PIM researchers have undertaken substantial collaborations, including recently on mobile phone platforms. Discussions are underway with **World Vision International (WVI)**, a major programmer of social protection interventions and a managing partner in PIM, to collaborate on evaluations and ex post impact assessments as well as linkages between agricultural programs and social protection in very poor areas.

**Private-sector partnerships** include insurance and reinsurance companies. Links are established with Aon Benfield, a large international reinsurance company with presence in India and South Asia, and with the HDFC Ergo insurance company in India. Partnership with the Agricultural Insurance Company of India is anticipated through CCAFS. Contractual relations with private companies that specialize in applying remote sensing imagery analysis to agricultural production decisions will be developed. Links with companies such as AgPixel and The Climate Corporation already exist. University partnership is established with University of California, Davis.

Collaboration with **A4NH** and **CCAFS** will continue. PIM works with A4NH on studying the interaction between social protection, agriculture, and nutrition; this work involves IFPRI and ILRI. PIM is exploring with RTB integration of a social protection component in projects working with poor potato farmers in the Andes. PIM and CCAFS (Flagship 2 on Climate Information Services and Climate-Informed Safety Nets) will work together to establish a Learning Platform on Weather-Related Insurance that will facilitate knowledge sharing and coordination across CRPs.

#### **2.4.1.8 Climate change**

Social protection and insurance are important components of the agenda for agricultural growth and poverty reduction, especially in the presence of climate change. The shifts in agroecology induced by climate change threaten the traditional livelihoods of poor households, thus increasing their chronic vulnerability. Social protection designed to complement agricultural adaptation to climate change can assist households to shift to new technologies, and to combine different sources of incomes. Climate change also increases the frequency of short-term shocks in the form of droughts, floods, heat waves, and pest outbreaks. Expansion and contraction of social protection programs in response to shocks can allow government and development partners to react quickly in times of need. Although insurance is not useful for protecting against changes in long-term trends, it can help address weather shocks creating variability around trend lines. Increased frequency of shocks may raise demand of smallholders for insurance, thus increasing the urgency to solve longstanding design problems and develop appropriate instruments. Climate change may also affect the risks that smallholders need to insure against, since changing weather patterns may bring floods or droughts to areas that rarely experienced them in the past. Finally, increased awareness of climate change and its impact on agriculture may make governments more willing to invest

in weather stations and agrometeorological capacity that will make index insurance affordable in places where in the past it was not.

#### **2.4.1.9 Gender**

Women and girls are overrepresented among the vulnerable. Work on social protection recognizes gender as a factor of importance in eligibility for social protection and targeting of benefits. Gender and the intrahousehold allocation of resources have been a major focus of the research in Phase 1; this focus will continue in Phase 2. Improving the impact of social protection on poverty and household food security and nutrition requires accounting for the unique roles that women play in household diets, provision of healthcare for children, and labor in agriculture, as well as how these are affected by socially determined relationships between women and men. Research from Phase 1 shows that transfers targeted to women decreased intimate partner violence (Hidrobo et al. 2016), which could have substantial effects on maternal and child well-being. In Phase 2, researchers will explore **whether transfers may also improve women's control over agricultural land and other productive assets, thereby reducing a major source of productive inefficiency**. Research on social protection is integrated with the work of Flagship 6 on the WEAI and the new BMGF-funded GAAP2 project on gender and asset-holding.

Research on insurance will consider whether women and men prefer different features in insurance products, and if so, why. Decisions about insurance are embedded in the decision-making process within the household; most smallholders are part of dual-adult households, in which decisions about insurance are joint. **Research on gender roles within the household in decisions on insurance** may yield new insights into design of insurance products, and will be undertaken in conjunction with Flagship 6.

#### **2.4.1.10 Capacity development**

Because much of the research on social protection is based on rigorous impact evaluations, the research team is experienced in providing capacity development on impact evaluation to partner governments, NGOs and, in some cases, donors. PIM researchers have substantial experience running capacity development workshops on topics related to impact evaluation, social protection, and nutrition. Capacity development for the work on insurance consists of collaborative research work with national counterparts. The implications of social protection innovations and insurance products on gender outcomes are discussed by all partners, and capacity development needs in these areas are identified. Table 2.4.1.10.1 summarizes the Flagship 4 capacity development approaches in relation to the elements of the CGIAR Capacity Development Framework.

**Table 2.4.1.10.1: Flagship 4 capacity development approaches in relation to the elements of the CGIAR CapDev framework**

CapDev element	Flagship 4 approach
1. Capacity needs assessment and intervention strategy design	Assess the capacity development needs of partners, related particularly to impact evaluation, social protection effectiveness, agricultural technology adoption, and nutrition, and explore the best strategies to build capacity of partners on these topics.
2. Design and delivery of innovative learning materials and approaches	PIM researchers have developed training materials on a variety of topics related to social protection and the design and conduct of impact evaluations. The leader of Flagship 4 in Phase 1 has developed substantial training materials on impact evaluation for a university-level course he teaches on “Impact evaluation for development.” PIM researchers will organize seminars and discussions on impact evaluation methodology when starting new studies.
5. Gender-sensitive approaches throughout capacity development	In line with Phase 1, gender issues will be emphasized in capacity development, including training programs for program implementers. Work on insurance will assist private firms to understand the gender dimensions of the appeal of different products.
6. Institutional strengthening	Work with partners to develop the capacity of other Centers and CRPs on specific impact evaluation tools.

#### **2.4.1.11 Intellectual asset and open access management**

In accordance with the CGIAR guidelines on intellectual asset and open access management, and with the policies of the lead Center and its partners, Flagship 4 will ensure access to its intellectual assets in a manner that encourages access, use, replication, and adaptation of its research while safeguarding the privacy of participants and protecting confidential and proprietary information. In 2015-2016, the team undertook a concerted effort to prepare datasets from social protection impact evaluations and other projects for public access on the IFPRI website, including making the data anonymous so that households in the study samples could not be identified based on the data provided. This includes the datasets from the IFPRI-WFP multi-country study comparing cash and food transfers, along with vouchers in Ecuador. As of now, two rounds of household survey data each for Ecuador and Uganda have been delivered for posting on the IFPRI website; data for Yemen and Niger are expected to be posted in the coming months. Flagship 4 will continue to identify datasets from its social protection research that can be made publicly available. In some cases, restrictions from government partners make it impossible to share the data; these situations are discussed on a case-by-case basis with relevant government counterparts.

#### **2.4.1.12 FP management**

The Flagship 4 management team includes **a flagship leader, and leaders for each of the two clusters.**

**The role of flagship leaders will be expanded in Phase 2 relative to Phase 1,** especially with regards to coordinating inputs from participants, reporting on flagship-level progress and budget execution, and tracking outcomes and impact. The flagship leader will serve on the PIM Management Committee. The flagship management team will be funded for one third of FTE for oversight of the flagship. PIM will also cover the cost of a flagship management support function (to help with formulation of annual work plans, tracking of deliverables, and reporting) up to 50% FTE by flagship.

The Phase 1 leader of Flagship 4 has led the preparation process for Phase 2. Flagship leaders for Phase 2 were selected in July, 2016 through a transparent merit-based process. The PIM Management Committee approved TORs for the positions and selection criteria including experience and excellence in the field (as measured through records of ISI publications and evidence of contribution to policy and other PIM outcomes), demonstrated ability to raise funds and attract strong research and implementation partners, and managerial experience. Staff from all Participating Centers and selected external partners were invited to nominate candidates. Self-nominations were allowed. A selection panel consisting of two SPAP members, one external partner, one representative of the Lead Center, and one representative of the PMU assigned scores to the nominees. As a result of this process, **Daniel Gilligan of IFPRI** was selected (CV in Annex 3.8). Cluster leaders will be chosen by September, 2016 through a participatory process led by the appointed flagship leader.

## 2.4.2 Flagship Budget Narrative

### 2.4.2.1 General information

CRP Name	Policies, Institutions, and Markets
CRP Lead Center	International Food Policy Research Institute
Flagship Name	Flagship 4: Social Protection for Agriculture and Resilience
Center location of flagship leader	IFPRI

### 2.4.2.2 Summary

Total Flagship budget summary by sources of funding (USD)

Funding Needed	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Total
W1+W2	1,580,000	1,580,000	1,627,400	1,627,400	1,676,222	1,676,222	9,767,244
W3	2,749,849	2,749,849	2,832,345	2,832,345	2,917,314	2,917,315	16,999,017
Bilateral	4,790,060	4,790,060	4,933,762	4,933,762	5,081,775	5,081,775	29,611,196
Other Sources							0
	9,119,910	9,119,910	9,393,507	9,393,507	9,675,312	9,675,312	56,377,457

Funding Secured	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Total
W1+W2 (Assumed Secured)	1,580,000	1,580,000	1,627,400	1,627,400	1,676,222	1,676,222	9,767,244
W3							0
Bilateral	2,841,216	1,875,203	937,601	426,182	0	0	6,080,203
Other Sources							0
	4,421,216	3,455,203	2,565,001	2,053,582	1,676,222	1,676,222	15,847,447

Funding Gap	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Total
W1+W2 (Required from SO)	0	0	0	0	0	0	0
W3 (Required from FC Members)	-2,749,849	-2,749,849	-2,832,345	-2,832,345	-2,917,315	-2,917,315	-16,999,017
Bilateral (Fundraising)	-1,948,844	-2,914,858	-3,996,161	-4,507,580	-5,081,775	-5,081,775	-23,530,993
Other Sources (Fundraising)	0	0	0	0	0	0	0
	-4,698,693	-5,664,706	-6,828,504	-7,339,923	-7,999,089	-7,999,089	-40,530,010

## Total Flagship budget by Natural Classifications (USD)

	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Total
Personnel	2,876,609	2,876,609	2,962,907	2,962,907	3,051,794	3,051,794	17,782,624
Travel	648,438	648,438	667,891	667,891	687,927	687,927	4,008,514
Capital Equipment	0	0	0	0	0	0	0
Other Supplies and Services	2,023,589	2,023,589	2,084,296	2,084,297	2,146,826	2,146,826	12,509,425
CGIAR collaborations	0	0	0	0	0	0	0
Non CGIAR Collaborations	2,570,620	2,570,620	2,647,739	2,647,739	2,727,171	2,727,171	15,891,064
Indirect Cost	1,000,651	1,000,651	1,030,671	1,030,671	1,061,591	1,061,591	6,185,830
	9,119,907	9,119,907	9,393,504	9,393,505	9,675,309	9,675,309	56,377,457

## Total Flagship budget by participating partners (signed PPAs) (USD)

	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Total
IFPRI	9,094,910	9,094,909	9,367,756	9,367,756	9,648,790	9,648,789	56,222,913
World Vision	24,999	24,999	25,749	25,750	26,523	26,522	154,544
	9,119,909	9,119,908	9,393,505	9,393,506	9,675,311	9,675,311	56,377,457

Explanations of these costs in relation to the planned 2022 outcomes:

Work in Flagship 4 examines vulnerability and risk, as well as instruments in the public and private sectors to manage them. Among the public-sector instruments are social protection and safety net programs, while private-sector approaches include various insurance products, as well as innovations in delivery of financial services to the poor.

Since a substantial component of the research is related to large-scale evaluations, there is a risk that delays in the start of these evaluations will result in temporary spending shortfalls. History shows that spending rates get back on track after such episodes. Other risks to spending mentioned in the program-level budget narrative apply to Flagship 4.

**2.4.2.3 Additional explanations for certain accounting categories**

**Benefits:** Benefit costs primarily include leave, health, and pension costs. The costs are pooled and allocated over a base consisting of total labor. The benefit pool divided by total labor creates the rate applied to labor. For most partners, the benefit rate used in this budget was the benefit rate for the Lead Center, i.e. 58.5%.

**Other supplies and services:** The “Supplies and services” category represents about 28% of the direct costs. This category includes field surveys; research support; cost-shared services for IT and other; workshops and training, including capacity development, meetings and conferences; editing and publications; miscellaneous charges such as copying and fax; a few partners also include benefits in this category.

#### 2.4.2.4 Other sources of funding for this project

The large bilateral/W3 donors for Flagship 4 in Phase 1 are **EC, DFID, International Initiative for Impact Evaluation (3ie), USAID, the World Bank, and WFP**. Additional funding is under discussion with other agencies and foundations.

#### 2.4.2.5 Budgeted costs for certain key activities

	Estimate annual average cost (USD)	Please describe main key activities for the applicable categories below, as described in the guidance for full proposal
Gender	3,305,967	See below and flagship narrative
Youth (only for those who have relevant set of activities in this area)	911,991	See below and flagship narrative
Capacity development	1,367,987	See below and flagship narrative
Impact assessment	455,995	See below and flagship narrative
Intellectual asset management	0	See below and flagship narrative
Open access and data management	0	See below and flagship narrative
Communication	344,197	See below and flagship narrative

**Gender:** The gender component of Flagship 4 is derived by assigning a gender percentage to each of the Sub-IDOs that the flagship contributes to (see Table C of the Performance Indicators Matrix). For the Sub-IDOs under IDO CC2.1 on Equity and inclusion achieved, the gender percentage is assumed to be 100%. Using this methodology, the Flagship 4 **gender budget for 2017** is estimated at **\$3.3M**, which represents 36% of the total flagship budget. Key gender activities in Flagship 4 are described in Section 2.4.1.9 of the Flagship 4 narrative.

**Youth:** For this flagship the level of intensity in addressing youth issues is estimated at **10%**, that is **\$0.9M in 2017**. The contribution of Flagship 4 to PIM's youth strategy is described in Annex 3.5.

**Capacity development:** The capacity development component of Flagship 4 is derived by adding up the flagship contributions to the capacity development Sub-IDOs, i.e. Sub-IDOs CC2.1.1, CC2.1.3, CC3.1.4, CC4.1.1, and CC4.1.2 (see Table C of the Performance Indicators Matrix). It is assumed that the flagship's contributions towards other Sub-IDOs do not count as capacity development. Using this methodology, the Flagship 4 **capacity development budget for 2017** is estimated at **\$1.4M**, which represents **15%** of the total Flagship 4 budget.

**Impact assessment:** The impact assessment budget is estimated to be **5%** of the flagship budget, for a total of **\$456K in 2017**. Examples of activities counted in this budget are evaluations of national social protection programs that will feed into impact assessment of PIM research.

**Open access and data management:** PIM is fully committed to complying with the CGIAR Open Access and Data Management (OADM) Policy and its Implementation Guidelines. Major infrastructures and staff required to do so are covered through overhead costs charged by the Centers, and include: maintenance of digital content collections; Online Public Access Catalog (OPAC)/library catalog systems; website development related to repositories; promotion and training in support of OA/OD. Additional costs specific to PIM research activities (essentially OA fees for journal articles) are budgeted for at project level under Supplies and Services.

**Intellectual asset management:** As explained in Annex 3.10 of the proposal narrative, the budget for IA management is the same as the budget for OA management (see above).

**Communications:** As described in PIM’s Communications Strategy, flagship leaders will appoint a staff member responsible for liaising with the Program Management Unit, participating in the PIM communicators group, and supporting the flagship’s communications activities, which include: contributions to the PIM newsletter and blogs; organizing knowledge sharing and capacity building events on the topics of the flagship research; representing PIM at local/regional events; and supporting application of the PIM Branding and Acknowledgement Guidelines at flagship level. It is estimated that these tasks will represent 0.3 FTE of a Communications Specialist, or about \$25K annually per flagship. In addition, Supplies and services include communications-related items, among which publications and workshops; these items are estimated to represent 3.5% of the flagship budget i.e \$319K in 2017. The total is **\$344K (3.8%** of the total Flagship 4 budget).

#### 2.4.2.6 Other

Please disregard the FTE allocations columns in the budget template (the computation of this item is not appropriate for an aggregated presentation of the personnel costs). The approximate number of FTE (average across years) for this flagship is 18. See Annex 3.8 for the CVs of the core members of the flagship team.

The total time dedicated to the **flagship coordination activities** is estimated at about 30% FTE. Following the guidance in the case when this percentage is below 50%, the corresponding costs are included in the flagship budget. PIM will also cover the cost of a flagship management support function up to 50% FTE by flagship; the corresponding costs are included in the program management costs.

There are no plans to purchase capital equipment.

#### 2.4.3 Flagship Uplift Budget

Outcome Description	Amount Needed	W1 + W2 (%)	W3 (%)	Bilateral (%)	Other (%)
Social protection programs and policies are modified based on evidence in 1 additional CGIAR country of collaboration (includes capacity development)	1,500,000	100	0	0	0
Improved social protection innovations provide food and nutrition benefits to poor households in 1 additional country (includes capacity development)	1,250,000	100	0	0	0
New insurance products are being used by smallholder farmers in 1 additional CGIAR country of collaboration (includes capacity development)	1,250,000	100	0	0	0

## 2.5 Flagship 5: Governance of Natural Resources

### 2.5.1 Flagship Project Narrative

#### 2.5.1.1 Rationale, scope

**Flagship 5 on Governance of Natural Resources** seeks to identify actions that can strengthen tenure rights of poor and marginalized people, particularly women, and communities; improve governance of natural resources; and enhance constructive interaction of resource users within shared landscapes. The CGIAR **grand challenges** addressed include competition for land from multiple sources, soil degradation, overdrawn and polluted water supplies, unsustainable harvests of fish and other aquatic products, and climate change.

The flagship examines the following questions (for more detail see Section 2.5.1.6):

- What are the **drivers and consequences of tenure insecurity**?
- What mechanisms and **institutional arrangements** can address threats to tenure security and strengthen tenure over land, water, and other natural resources?
- What **tools and indicators** can be used to assess tenure security and create accountability for implementation of reforms?
- How can the **interests and knowledge of different actors** sharing a common landscape be identified and reconciled in ways that better secure the livelihoods of women, youth, and other poor and vulnerable groups?
- How can a better understanding of **political economy processes** contribute to more equitable outcomes for the poorest users within shared landscapes?

A substantial body of work confirms that secure tenure and well-performing institutional arrangements matter for technical dynamism in rural areas and investment in agriculture (Holden et al. 2013; Lawry et al. 2014). Tenurial regimes and institutional arrangements contribute to growth, sustainability, and inclusion, with a particular focus on **sustainability and inclusion** (Figure 1.0.6.1, Section 1.0.6). Tenurial regimes can also be powerful instruments of exclusion if controlled by elites or implemented to reinforce traditional hierarchies of power. Changes in tenure of resources and interactions among users of shared resources take place in a context of rural change. Land and other resources are shifting from customary to statutory status; forest tenure gives way to tenurial arrangements of agrarian regimes; large private holdings increase; and governments invest in public infrastructure. Lack of attention to resource governance under these circumstances carries high risk for development programs, particularly with regard to inclusion, equality, and poverty reduction.

**Cluster 5.1 – Enhancing Tenure Security** aims to document the impact of secure tenure of land and non-land resources (water, fish stocks, and forests). Researchers also investigate mechanisms to strengthen insecure tenure and weak institutions that avoid unintended consequences for people and the environment. The contribution of natural resources to rural livelihoods and food security often entails competition over resource rights at multiple scales. **Cluster 5.2 – Governing Shared Landscapes** analyzes the institutional arrangements governing resource use (for example, land and rights to water, trees, fisheries, genetic resources, and other natural resources) within dynamic shared landscapes. This cluster addresses the management of resources held in common or individually, under formal, informal, and legally pluralistic arrangements. The rights and roles of women and members of marginalized groups (for example ethnic minorities and Indigenous Peoples) and the contributions of natural resources to their livelihoods receive particular attention, as do intergenerational transfer of tenure rights and implications for young people.

**Researchers in Flagship 5 work with colleagues in other flagships of PIM.** Flagships 5 and 1 are linked together (and with the AFS CRPs) through work on the implications of tenure and institutions for adoption of technology. Teams from Flagships 5 and 2 work together to clarify the role of markets for natural resources, particularly land, in the process of rural transformation. Flagships 5 and 4 are linked because vulnerability often exacerbates resource degradation, and conversely social protection programs with labor-intensive public works can reverse (or if poorly implemented, worsen) resource degradation.

**Important international initiatives have emerged to promote better land and resource governance** in Africa south of the Sahara, Asia, and Latin America, and staff working under Flagship 5 are well-connected to them. Examples include the FAO-led Voluntary Guidelines (VGs) on the Responsible Governance of Tenure, the African Union's Land Policy Initiative (AU-LPI), and the World Bank's Land Governance Assessment Framework (LGAF), among others.

Many communities have gained rights to resources that had earlier been held by government agencies, and increasingly interact directly with private firms seeking access to resources. The interest of private firms in environmental and social responsibility creates additional need for research and capacity building for communities. Flagship 5 will carry out research to evaluate the performance of new investment arrangements involving common pool resources in collaboration with Flagship 3 and FTA's work on sustainable value chains, finance and investment. Teams will also draft training materials to help communities develop capacity to manage their new responsibilities successfully.

The work of Flagship 5 is well-embedded in national policy processes, notably in Africa (Ethiopia, Ghana, Kenya, Malawi, Mali, Morocco, Mozambique, Nigeria, Tanzania, Uganda, Zambia), Asia (Bangladesh, Cambodia, India, Myanmar, Nepal, Vietnam), and Latin America (Guatemala).

### **2.5.1.2 Objectives and targets**

The ultimate objective of Flagship 5 is empowerment of users of natural resources, particularly women and members of marginalized groups, to understand and command their rights over resources in ways that contribute to growth, sustainability, and inclusion. Tenure reform, institutional innovations, and capacity development are supported as instruments of empowerment.

As indicated in Table 2.5.1.2.1 and Figure 2.5.1.3.1, Flagship 5 contributes to **SLO 3 on Improved natural resource systems and ecosystem services** (through IDO 3.2 Enhanced benefits from ecosystem goods and services), to **SLO 1 on Reduced poverty** (through IDO 1.4 Increased productivity), and to the cross-cutting areas on **gender and youth (CC2), policies and institutions (CC3), and capacity development (CC4)**.

Table 2.5.1.2.1 displays outcomes as elements independent from one another, which does not well reflect the empowerment processes involved in the activities of Flagship 5. In this flagship more than others in PIM, research processes are participatory, and include beneficiaries of changes. In such action research, capacity building of participants and local researchers is built into the pursuit of other outcomes not directly pertaining to capacity building. Due to the joint production of outcomes in Flagship 5, the relative weights displayed in Table 2.5.1.2.1 should be considered indicative only.

**Table 2.5.1.2.1: Contributions of Flagship 5 to the CGIAR Sub-IDOs**

Sub-IDOs	Relative contribution (%)
1.4.5 Increased access to productive assets, including natural resources	30
3.2.1 More productive and equitable management of natural resources	30
CC2.1.1 Gender-equitable control of productive assets and resources	15
CC3.1.3 Conducive agricultural policy environment	10
CC4.1.2 Enhanced individual capacity in partner research organizations through training and exchange	5
CC4.1.4 Increased capacity for innovations in partner development organizations and in poor and vulnerable communities	10
Total	100

The **specific outcomes of Flagship 5** are:

- **Stakeholders possess strengthened capacity to undertake work on tenure and governance.** The research methods, collaborative research process, and community of practice developed under Flagship 5 will contribute to the capacity of partner researchers, development organizations, and community organizations to measure and analyze tenure security and landscape-level resource governance (Sub-IDOs CC4.1.2 and CC4.1.4).
- **Evidence informs natural resource governance and tenure policy processes and implementation** (by 2022 in twelve countries, including six CGIAR countries of collaboration); and countries reform policies or institutions to strengthen resource tenure and governance using the PIM results. This outcome contributes to Sub-IDO 1.4.5 Increased access to productive assets including natural resources and to Sub-IDO 3.2.1 More productive and equitable management of natural resources, as well as to Sub-IDO CC3.1.3 Conducive agricultural policy environment. Policies or institutions that incorporate measures to improve gender equity in resource tenure and/or management decision making further contribute to Sub-IDO CC2.1.1 Gender-equitable control of productive assets and resources. This outcome draws from research in Clusters 5.1 and 5.2, and is a first step towards the more downstream outcomes of increased tenure security and better management of shared landscapes.
- **Tenure security is improved** for beneficiaries (by 2022 in six countries, with detailed documentation for two). Rural communities, households, and individual women achieve greater resource tenure security as a result of governance interventions applying PIM research. The partnerships with government, regional and international initiatives, other CRPs, and civil society advocacy and implementers contribute to scaling up the Cluster 5.1 research outcomes. Increases in tenure security will lead to Increased access to productive assets, including natural resources (Sub-IDO 1.4.5), and will also facilitate a Conducive agricultural policy environment (Sub-IDO CC3.1.3). Tenure reforms and governance interventions that increase women's tenure security will contribute to Gender-equitable control of productive assets and resources (Sub-IDO CC2.1.1).
- **Shared landscapes are under more productive and equitable management** as a result of governance interventions applying PIM research. This outcome will be observed in different types of landscapes, including forests, pastures, fisheries, coastal seascapes, and arable land. This outcome draws from Cluster 5.2 research, in conjunction with DCL, FTA, FISH, LIVESTOCK, WLE, and CCAFS, and interventions led by network partners such as International Land Coalition (ILC) and Foundation for Ecological Security – which works in over 8,800 villages spanning 2.6 million acres of common lands in India. Such collaboration contributes to Increased capacity for

innovations in partner development organizations and in poor and vulnerable communities (Sub-IDO CC4.1.4). This, in turn, leads to More productive and equitable management of natural resources (Sub-IDO 3.2.1) as well as Gender-equitable control of productive assets and resources (Sub-IDO CC2.1.1). It is expected that in 2022 improved landscape-level governance arrangements as a result of interventions applying PIM research will lead to more productive and equitable management in six countries, with detailed documentation in two.

### ***2.5.1.3 Impact pathway and theory of change (for each individual FP)***

The theory of change for Flagship 5 is embedded within the general theory of change for PIM (Figure 1.0.3.1). **The three major constraints addressed are weak property rights, poorly functioning or missing markets for natural resources, and gender-based restrictions in ownership and access to resources.** The theory of change rests on the **assumptions** that: (a) rigorous analysis of the costs and benefits of tenure change must be coupled with empowerment of beneficiaries to secure passage and implementation of needed reforms; and (b) users of shared resources, when empowered and informed, can agree on institutional arrangements that accommodate disparate interests and serve the common good.

Engagement at the global level can be productive, and PIM participates selectively in this effort, as for example through assisting with design of indicators for women's land holding used by FAO. However, due to the importance of context-specific institutions and norms, most of the work is positioned at the national and local levels. Information and analyses are insufficient by themselves to achieve change in policies and institutions governing natural resources. Changes are in some cases administratively demanding (for example in the area of land administration), and in others hotly contested by interest groups. National public agencies, civil society actors representing specific interests, international agencies responding to demands of their constituencies, and private corporations responding to shareholders and customers, are active in the public debate and behind-the-scenes discussions. Astute reading of the political context is often required to spot opportunities of change, and local champions must be able to mobilize political support. The flagship teams thus invest significantly in the portion of the policy spiral (Figure 1.0.3.1) devoted to identifying actors, strategizing about the mechanism for change, and selecting partners. The changes required to achieve greater inclusion and sustainability imply significantly different roles than in the past for resource users, smallholder farmers, community organizations, women, young people, and members of marginalized groups. Unless they are involved in the process of change, these stakeholders are unlikely to have the confidence and skills to undertake their new and essential roles successfully. Thus capacity development and participatory research done jointly with beneficiaries are an important part of the work.

Impact pathways for Flagship 5 are shown in Figure 2.5.1.3.1. The importance of participation is reflected in the key outputs, many of which are developed through participatory research. **Four primary outputs** are:

- **Innovative and improved research methods**, such as citizen data and community-based data validation on tenure security and experimental games.
- **Analysis of the effects of tenure and governance mechanisms on multiple outcomes**, with emphasis on power relations, gender norms, and opportunities for adoption of climate-smart agriculture and other innovations from the AFS CRPs.
- **Options for communities and individuals to improve tenure security and governance**, based on analysis of the factors of success, and including examples of interactions between and among individuals, CSOs, governments, and the private sector that led to pro-poor outcomes.

- **Community of practice and resource center on tenure security and shared landscapes**, building on the [Systemwide Program on Collective Action and Property Rights](#) (CAPRI) community of practice.

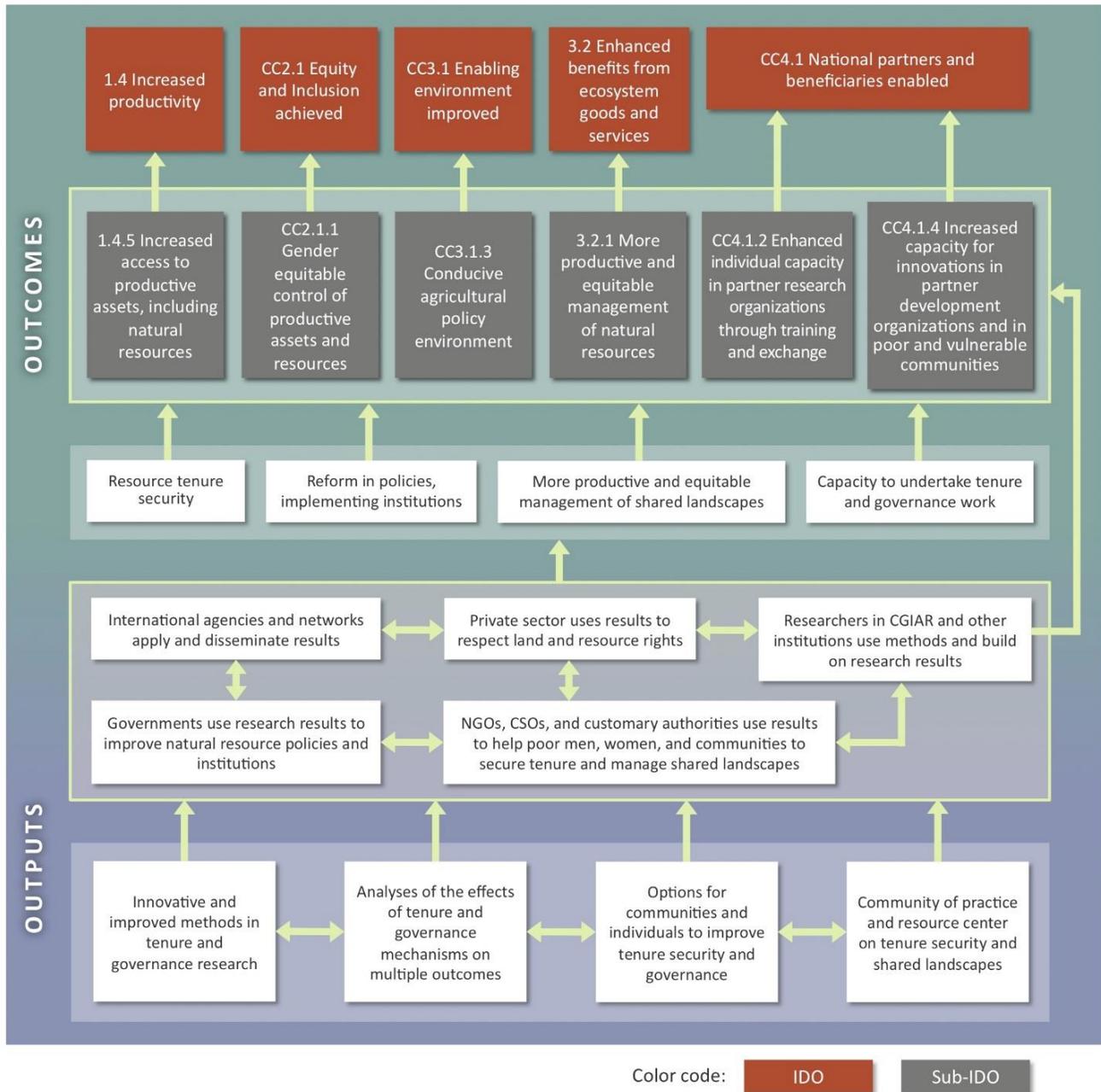
The outputs are used by the actors noted in Figure 2.5.1.3.1; many of them are also involved in developing the tools. As noted in the [recent independent evaluation of the PIM program](#), Flagship 5 has established strong **partnerships with organizations that are key to the flagship's impact**. This will continue in Phase 2, through work with six major groups:

- **Governments and national agencies**, especially interministerial taskforces and multistakeholder platforms
- **International agencies** involved in drafting and promoting implementation of the Voluntary Guidelines and the Principles for Responsible Agricultural Investment
- **Regional and global action networks**, including civil society and intergovernmental coalitions (for example, International Land Coalition)
- **NGOs, CSOs, and customary authorities** engaged in advocacy and implementation of programs
- **Private sector and public-private platforms**, such as the Consumer Goods Forum and Tropical Forest Alliance 2020
- **Researchers** in NARS, universities, and other CRPs

These groups will collectively contribute to Increased access to productive assets, including natural resources (Sub-IDO 1.4.5). Applying tested options for governance of shared landscapes that include women and marginalized occupational or ethnic groups will contribute to More productive and equitable management of natural resources (Sub-IDO 3.2.1), and strengthen Gender-equitable control of productive assets and resources (Sub-IDO CC2.1.1). As tenure becomes more secure, producers are more likely to invest in new technologies and innovations generated by the AFS CRPs, leading to increased productivity, and expanding opportunities for youth employment in agricultural landscapes.

The activities in Flagship 5 are subject to several **risks**. The highly political nature of most of the work on tenure increases the risk that researchers may be perceived as partisan rather than objective (see Section 1.0.3). To mitigate this risk, researchers are careful not to participate directly in political debates. The participatory nature of the research and use of qualitative methods carry the risk that results may be specific to the cases investigated, and not amenable to generalization. Qualitative and participatory methods will be combined with quantitative methods for rigor and testing of more general applicability. Advocates for the disempowered may lack skills for effective advocacy, even with the benefit of research results and capacity building. To mitigate this risk, researchers will select partners with consideration of potential for success. Work on shared landscapes is complex and carries the risk that it remains at a general level, without sharp focus on practical applications or linkage with work of other flagships and CRPs. Researchers will manage this risk through selectivity in the choice of topics, and engagement with colleagues in at least three CGIAR countries of collaboration on practical aspects of natural resource management that are important for the CGIAR agenda in these countries.

Figure 2.5.1.3.1. Impact pathways for Flagship 5



#### **2.5.1.4 Science quality**

Researchers in Flagship 5 use **interdisciplinary methods that draw on social and political sciences, ecology, and legal studies**. Interdisciplinary methods are particularly fruitful for understanding the functioning of property rights systems and other resource governance arrangements in different environmental and development contexts, their reforms, and their outcomes. **Rigorous qualitative and quantitative techniques are used together with participatory action research**. This combination increases the likelihood that the research results are relevant to and well-accepted by stakeholders who drive the processes of change.

The PIM external evaluation commended this flagship for **scientific excellence in the research on tenure and landscape governance, a strong record of publications in major peer-reviewed journals, longstanding research partnerships with key organizations and networks, clear impact pathways, and the robust community of practice it leads through CAPRI**.

CAPRI was created to foster research and promote collaboration on institutional aspects of natural resource management among all CGIAR Centers and over 400 national agricultural research institutions, universities, and other organizations. This community of practice helps to circulate instruments and methods, identify evolving research priorities, and build on research findings. Flagship 5 benefits from this positive history, and extends its work in new directions, particularly engagement with the private sector.

Science quality will be maintained at a high level in Phase 2, through: (a) peer-review of detailed research proposals for implementation of the work of the flagship; (b) workshops to discuss methodologies and emerging results; (c) presentations at international conferences (e.g. World Bank Land and Poverty Conference, International Association for the Study of the Commons, and Global Landscapes Forum); (d) open access, peer-reviewed working papers that disseminate findings while allowing authors to receive feedback; and (e) condensing key findings into policy briefs and training materials of the same type as the [CAPRI Sourcebook](#).

As noted by Clark et al. (2011), linking research information to decision making calls for salience, credibility, and legitimacy. An advisory group of key scholars and practitioners (from civil society, government, and private sector) will provide guidance on the salience and credibility of the research. The partnership strategy and engaged research are designed to enhance the legitimacy and impact of the work.

**Land tenure research** in Phase 1 used the Land Governance Assessment Framework (Deininger et al. 2012) to assess legal frameworks and their implementation. Phase 2 will assess legislative frameworks for other natural resources as well, with particular attention to their provisions for inclusiveness and implementation. In Phase 1, PIM contributed to the development of new methods to measure tenure security at the intrahousehold level. The survey instruments developed for Nigeria (Ghebru et al. 2014) provide the basis for the land tenure modules used in the Living Standards Measurement Survey (LSMS) in other countries. These instruments allow disaggregation by gender and age (see [GAAP 2014](#)). In Phase 2, such efforts will be expanded to include collective or community land tenure building on Phase 1 work in Mozambique (Ghebru et al. 2015), and rights to other resources including water, trees, and fish stocks, building on ICRAF's Rapid land tenure assessment (Galudra et al. 2013). These studies will draw on research on common property (e.g. Ostrom 1990) to examine the state and local institutional arrangements for resource access. The team will also partner with community organizations on citizen data initiatives, such as having women's organizations document women's land rights, to investigate the

potential for such initiatives to increase the quality of data and reduce the cost of collection. Collaboration with ILC's Land Observatories in countries provides the opportunity to test and scale up these methods.

**Research on landscape governance** in Phase 1 includes the launch of the [Collaborating for Resilience](#) partnership, which addresses natural resource conflict and competition (Ratner et al. 2014). Phase 2 will build on this and lessons on multifunctional landscapes from CCAFS (Minang et al. 2014). The research team has extensive experience with landscape-level action research using mixed methods such as focus group discussions, direct observations, ecosystem services assessment, and choice experiments. Particular attention will be given to developing and refining innovative techniques for stakeholder engagement and learning. Netmapping (Schiffer and Hauck 2010) and other stakeholder mapping tools will provide a starting point for identifying information and resource flows and power structures. New techniques such as role-playing games, which were developed in Phase 1 to probe options for land use (Villamor 2014; Falk 2016), will be expanded to new applications. In Phase 2, researchers will scale up innovative use of experimental games piloted in WLE as a tool to strengthen collective action in water management (Meinzen-Dick et al. forthcoming), developing new games that communities can use for forestry and other common resources. Ostrom's theoretical framework of polycentric governance (2010a, 2010b) will provide the basis to identify arrangements for communities and different levels of governments to work together, and will be extended to include the role of private investors and industry associations.

The importance of empowerment in the theory of change and impact pathways for Flagship 5 (see Section 2.5.1.3) requires that researchers be familiar with the **concept and tools for analyzing and measuring empowerment**. The leader of Flagship 5 in Phase 1 was instrumental in developing the Women's Empowerment in Agriculture Index (Alkire et al. 2013), and empowerment is a strong theme throughout the work of the CAPRI network (see [CAPRI Sourcebook](#)). Questions on women's resource rights and the participation of women and young people in decision making impinge on power relations, and are very sensitive, especially in patriarchal societies. The team has considerable experience in addressing such sensitivities, using a range of methods such as vignettes to address sensitive topics in surveys, role-playing games to increase understanding of others' positions, and enlisting local leaders as champions for inclusion in action research. These lessons will be integrated into the work with partners in Phase 2.

A balance of strategic, comparative research and action research in priority geographies will ensure quality and relevance. Appropriate analytical models and evaluation criteria will be applied within research partnerships in order to augment the effectiveness of stakeholders already highly committed to achieving impact on the ground.

### ***2.5.1.5 Lessons learnt and unintended consequences***

Planned work is informed by lessons learned during Phase 1 and earlier:

- Studies on **tenure** from Ethiopia, Mozambique, and Nigeria show the need for pragmatic and context-specific approaches to land policy and governance (Hagos 2012; Ghebru et al. 2014; Ghebru and Holden 2015). NGO or community-based legal assistance is often required for implementation of reforms to help women or the poor (Behrman et al. 2013). Though promising in many settings, formalizing property rights is a complicated and costly process, with many risks to smallholders, including the risk of elite capture of land, water and forests. Formalization often fails to take into account the rights of users who derive secondary livelihood benefits from forests (Jagger et al. 2014). Phase 2 will look for alternatives to formalization, as well as at ways to protect rights when formalization is warranted.

- Interventions can strengthen institutions to manage **conflict** caused by overlapping claims. ICRAF’s Rapid Land Tenure Assessment for Identifying the Nature of Land Tenure Conflicts (RaTA) and WorldFish’s Collaborating for Resilience approach have proved useful in managing resource-based conflicts (Galudra et al. 2010; Ratner et al. 2014). Work in Phase 2 will extend this from fisheries to forestry and other resources.
- Measures such as putting women’s names and photos on land certificates in Ethiopia can contribute to security and investment in land if women are provided information about the titling system (Kumar and Quisumbing 2015). Recognition in law of women’s rights to land, forests, and other resources is useful, but full **empowerment of women** requires changes in local social norms (Sunderland et al. 2014). Attention to women’s voices and decision-making roles in multistakeholder dialogues can shift the goals of collective action towards a more equitable distribution of benefits (Ratner et al. 2011). Work in Phase 2 will extend these considerations to tenure and participation of **youth**, paying particular attention to potential trade-offs between tenure security of widows and youth.
- CIFOR, ICRAF, and WorldFish have found that **multistakeholder processes** build trust, diminish power asymmetries, and better align divergent interests in ways that can yield more equitable outcomes. Disadvantaged groups need support and assistance to engage effectively in key forums (Leimona et al. 2015; German et al. 2011; Ratner et al. 2014). Action research in Phase 2 will pay particular attention to documenting mechanisms to address power relations.
- Recognition of local land rights and guarantees of smallholders’ access to “green” value chains are key elements of zero-deforestation pledges by companies and countries, and show the importance of negotiations between stakeholders (Pacheco 2012; Rist et al. 2010). Based on the consultative process used for developing this proposal, the Flagship 5 team will strengthen engagement with the **private sector** and **customary authorities**.
- Impacts of change in tenure and governance flow through multiple channels, including conflict reduction (Ratner et al. 2013), and increasing adoption of climate-smart agriculture with long time horizons or large spatial scale (Meinzen-Dick, Bernier and Haglund 2013).
- Children of mothers with enhanced tenure security are less likely to be severely underweight (Allendorf 2007). Land titling that includes women as co-owners empowers women and contributes to **household food security** (Santos et al. 2014).

**Conclusions drawn from findings of Phase 1 have informed a decision to de-emphasize some topics** to make room for more work on management of shared landscapes. In Phase 1, PIM funded a modest line of research specifically on water resource policy; in Phase 2, this work is passed to WLE; PIM will still include water resources in work on water rights, resource tenure, governance and shared landscapes. The activities to address energy in agriculture which PIM invested in in Phase 1 will also be discontinued, with the exception of biofuels.

### 2.5.1.6 Clusters of activity (CoA)

Flagship 5 consists of two clusters: **Cluster 5.1 – Enhancing Tenure Security**, and **Cluster 5.2 – Governing Shared Landscapes**. The two clusters together contribute toward enhanced rights and secure tenure for the poor, and complementary exercise of rights within landscapes.

#### *Cluster 5.1 – Enhancing Tenure Security*

Work within this cluster examines **mechanisms to enhance rights to resources in different contexts**, and probes **how differently assigned and protected rights contribute to productivity, livelihoods, equity, ecosystem services, and sustainable use of biological diversity**. Trade-offs and complementarities between collective and individual tenure (now often viewed in isolation) will be considered, as will linkages between tenure of land and rights to water, trees, fisheries, genetic resources, and other natural resources. Interdisciplinary approaches drawing on social and political sciences, ecology, and legal studies will be used to understand the functioning of property rights systems in different environmental contexts, the reforms of these systems, and their outcomes. Work will address the institutional arrangements at multiple levels, and the shift of land governance from customary to statutory status. The increased presence of large private holdings, and the reasons for and implications of subdivision or consolidation of holdings, will be considered. The focus on women's rights to land and resources accorded in Phase 1 will be retained, and coupled with specific attention to interests of young people. Ethnicity and identity through occupation (fishers, pastoralists, and forest-dependent communities) will be addressed as factors affecting inclusion.

**Research questions** include:

- What are the **drivers of tenure insecurity** in particular contexts for particular groups (including women, youth, pastoralists, smallholder farmers, forest users, peri-urban communities)?
- What are the **consequences of tenure security and insecurity**? How can secure tenure and transparently assigned rights contribute to sustainable intensification (including adoption of climate-smart agriculture), social equity, economic empowerment, and provision of ecosystem services from land and other resources?
- What mechanisms and **institutional arrangements** can address threats to tenure security, and strengthen tenure over land, water, and other natural resources in different contexts?
- How can the **interests of vulnerable groups** be represented in tenure policy and rural investment decisions?
- How can **greater equality in access to resources** be factored into decision making on the assignment of rights, including ways of embedding equality within national policy and law on access to natural resources?
- What **tools and indicators** can be used by governments, donors, civil society, the private sector, and local leaders to assess tenure security and create accountability for implementation of reforms?

The following **activities and methods** will be used to address these questions:

- Qualitative assessment of legislative frameworks (for women's land rights, intergenerational transfer of rights, commons, pastoral tenure, and land consolidation) and their implementation, using a set of land governance indicators.

- Extending land tenure indicators to water, trees, and other resources to assess security of tenure of different social groups, including women, pastoralists, and fishers, and suggest ways of increasing equality in access to these resources.
- Quantitative assessment of effectiveness and equity of tenure reform programs using sex- and age-disaggregated surveys, case studies, and farm and landscape modeling.
- Multistakeholder platforms, focus group discussion, participatory mapping, and development of political-economic tools for analyzing equitable institutional arrangements for resource tenure.
- Use of sex- and age-disaggregated survey data and citizen data initiatives to analyze how land and water policies and programs affect women, young people, and other groups.

The key **outputs** include:

- **Improved methods for diagnosis, monitoring, and evaluation of tenure systems and reforms** in different contexts. Flagship 5 will improve on existing methods that focus on either collective or household or individual property rights, but not on the interactions among these types of rights; and on existing methods for intrahousehold analysis that focus on male and female heads of households, and not on the youth or the elderly (e.g. widows). Innovative approaches incorporating citizen reporting on tenure security (including "perceived" tenure security) will be triangulated with surveys and official statistics.
- **Analyses of the effects of tenure reforms on technology adoption, productivity, and inclusion.**
- **Tested options and identification of potentially scalable solutions to strengthen tenure security** (including policy measures) adapted to various settings. This will draw on action research, participatory mapping, as well as impact assessment of policy reforms and implementation (community-based legal assistance, incorporation of tenure in REDD+ with FTA).
- **Community of practice** including other CRPs, research organizations, civil society, and government partners, with strengthened capacity of partner organizations to assess tenure security and transform research into implementation.

In terms of **geographic targeting**, work on individual tenure issues will be conducted primarily in Africa, especially in Ethiopia, Ghana, Kenya, Malawi, Mali, Mozambique, Nigeria, Tanzania, Uganda, and Zambia, where key reforms are considered or underway. Work on collective land and other resource tenure will be undertaken in Bangladesh, Guatemala, India, Nepal, and Vietnam, in conjunction with FTA, FISH, LIVESTOCK, and WLE.

Work of Cluster 5.1 is closely linked to that of Flagship 2 through the impact of land tenure and functioning of land markets on inclusive transformation (Cluster 2.1), as well as the contribution to the body of knowledge on the political economy of policy change (Cluster 2.3). Cluster 5.1 also connects with Cluster 1.2 and the AFS programs on tenure dimensions that affect adoption of technology. The effects of multiple beneficiaries' experiences on their levels of contribution to ecosystem service provision under different tenure systems will be studied in collaboration with WLE. In the context of drylands, interactions between governance frameworks related to diverse livelihood sectors and land tenure will be assessed in collaboration with DCL.

#### *Cluster 5.2 – Governing Shared Landscapes*

Holders of rights to resources are linked through landscape-level ecosystems. Actions of those with land rights may affect the quality and quantity of water available for "downstream" users, thereby impinging on holders of water rights and rights to fish stocks. Ecosystems function at scales greater than individual

holdings, and coordination is required to secure shared benefits and defend underrepresented stakeholders. Both through protection of ecosystem services against natural hazards and fallback options for livelihoods, the commons provide important sources of resilience.

Work in this cluster develops **institutional solutions for challenges related to disparate interests of parties with overlapping rights and claims to resources**. Competing interests, fragmented institutions, and contested resource claims within shared landscapes can spark conflict, discourage investment, accelerate resource depletion, and increase social inequality. Better management of resources and avoidance of conflicts in shared landscapes will lead to enhancement of ecosystem services and increased investments by governments, the private sector, and producers in these landscapes. Institutional innovation can increase inclusion, tenure security, and levels of ecosystem service access. Because of the need to bring together interested parties, much of the work entails engaging a range of actors in constructive dialogue, building the conditions for them to develop their own solutions, and empowering selected participants with capacity to monitor outcomes and results. Whereas earlier PIM research on this topic focused on strengthening local collective action initiatives, work in Phase 2 will also address interactions between local users and collective institutions, the state, and corporate investors.

As new kinds of investment partnerships emerge, research will generate insights into arrangements that ensure strong economic returns, equitable distribution of benefits, and sustainable environmental outcomes within shared landscapes. Research will also provide a more rigorous understanding of the risks associated with these investments, which will facilitate management of these risks. A range of instruments can be combined to put in place governance arrangements found to work: bylaws, regulation (including land-use planning), economic incentives (such as taxes, subsidies, and payments for ecosystem services), and recognition or moral suasion (including tapping into local traditions of resource management or corporate social responsibility), as well as a variety of formal and informal mechanisms of accountability. Interactions between these instruments strongly affect impacts, but which combinations may be best in different contexts is poorly understood. Measures that adjust power relationships among participants to increase inclusion (such as social and environmental certification, and rules specifying participation of women and other groups in decision-making arenas) will be explored. The work is grounded in the theory of the commons and polycentric governance of natural resources, as well as political economy and political ecology, which is well-developed but has not been applied systematically to compare experiences across multiple resource systems in low-income countries.

**Research questions** include:

- What are the interrelations and **impacts of multiple overlapping resource governance and tenure systems** on key landscape types in Africa south of the Sahara and South and Southeast Asia? What are the implications of new tenure claims and management authorities, including those associated with response to climate change, biodiversity conservation, and agroindustrial investment?
- How can the **interests and knowledge of different actors** (including local residents, resource user groups, and investors) sharing a common landscape be identified and reconciled in ways that better secure the livelihoods of women, youth, and other poor and vulnerable groups? Which structures are best suited to provide **equitable representation** of different agents in landscape decision-making processes? How can these structures interact more constructively **to resolve issues and conflicts and develop sustainable co-management** of landscapes that supports the interests of women, youth, and smallholders?

- What **support from external parties** is useful to mediate the represented interests and inform negotiations among interested parties? What role should external parties play in monitoring implementation of agreed solutions?
- How can a better understanding of **political economy processes** contribute to more equitable outcomes for the poorest users within shared landscapes?

The following **activities and methods** will be used to address these questions:

- Case studies at individual, household, community, landscape and waterscape level (for example rangelands in Ethiopia and Tanzania; forests and common lands in India; fisheries in Tanzania) in collaboration with CCAFS, DCL, FTA, FISH, and LIVESTOCK, to understand overlapping resource claims and how these play out in different contexts for different groups of actors, and what factors influence the outcomes.
- Collaborative governance assessment, multistakeholder dialogue using the Collaborating for Resilience approach, mixed-methods outcome evaluation (for example Bangladesh/Bay of Bengal transboundary fisheries).
- Collaborative, interdisciplinary research on governance, with partners involved in research design, diagnostic studies, and documentation of lessons learned (for example governance of fisheries in Myanmar; watershed impact and scenario analysis in India); linking results from experimental games, GIS-based land use change analyses, and other studies to understand impacts of watershed interventions.
- Landscape level action research using mixed methods such as focus group discussions, direct observations, ecosystem services assessment, choice experiments, experimental games and role play games, stakeholder mapping, power and network analysis, and political economy analysis to identify ways to improve resource governance (in partnerships with CCAFS , DCL, FTA, and WLE).

The key **outputs** include:

- **Improved methods.** This cluster will compile and refine existing tools and methods, for example use of experimental games for community-based collective action, approaches to multistakeholder dialogue and to engagement with private investors and companies, and tools for evaluating politics of decision making in shared landscapes.
- **Analyses of the effects (positive and negative) of alternative governance arrangements** in different types of landscapes on access to, use of, and productivity of natural resources, provision of ecosystem services, biological diversity, and the distribution of benefits for poor resource-dependent people, including women.
- **Tested options** to address challenges of coordination and effective brokerage for shared governance. Examples of successful interaction between and among individuals, CSOs, governments, and the private sector will be compiled and made available for wider dissemination. Action research sites in conjunction with FISH and FTA will be used to promote cross-country learning.
- **Community of practice and resource center.** An online resource center will package key messages for advocacy on a global scale and relevant to a range of global landscapes, covering topics such as diagnosing tenure and governance problems, and the suitability of policy measures and reform strategies under different conditions.

Cluster 5.2 builds on Phase 1 research under PIM, AAS, Dryland Systems, FTA, LIVESTOCK, and WLE, that addressed coordination and conflict in managing shared landscapes combining arable land, pastures,

forests, inland waterbodies, and coastal seascapes. These linkages will be expanded, with WLE and FTA on institutions and payments for ecosystem services, with DCL on different sectoral governance frameworks on the landscape scale, and with CCAFS on climate-smart landscapes; and will provide a channel for sharing lessons across CRPs. Collaboration with PIM's Flagship 4 will examine how social protection programs affect the management of natural resources.

The work of Cluster 5.2 will take place in selected sites in **Bangladesh, Ethiopia, Myanmar, Tanzania, and other locations** to be selected during the course of implementation.

### **2.5.1.7 Partnerships**

PIM's **comparative advantage** in Flagship 5 derives from technical competence of the research team, the relevance of the work to the SLOs and the portfolio of CRPs, and the unique contribution that Flagship 5 provides in conjunction with other partners. The Flagship 5 team draws on a tradition of recognized expertise in policy analysis for natural resource management established originally through CAPRI and further developed with the launch of the CRPs. The expanded network includes many partners, among whom CAPRI and now PIM are recognized as honest brokers able to work creatively across disciplines and issues. Unlike many organizations that conduct research on land tenure, PIM looks at tenure linkages between and among resources, and investigates in detail both common and individual property. The work of Flagship 5 brings together AFS CRPs (FISH, FTA, LIVESTOCK) and Integrating CRPs (CCAFS, WLE, PIM) to coordinate analysis of tenure reform and governance across rangeland, forest, aquatic, and agrarian landscapes. The team thus leverages learning across CRPs, and draws on a substantial body of bilaterally-funded projects. CIFOR, as FTA lead, has decided to transfer most of its work on tenure issues to PIM in Phase 2, while enhancing FTA's work on forest-based institutions. Thus the expertise on land issues established during PIM in Phase 1 will be strengthened by the significant engagement of CIFOR in PIM in Phase 2.

**Biodiversity, CIFOR, ICRAF, ICRISAT, IFPRI, ILRI, IWMI, and WorldFish** participate in Flagship 5. Collaboration is planned with DCL, FISH, FTA, and WLE on governance of multiple use production systems, global value chains, and sustainable intensification, and with CCAFS on collective action institutions for climate-smart landscapes. Adherence of private firms to standards for environmental, social, and governance dimensions of business practices links Flagship 5 to FTA's work on sustainable value chains, finance and investment. PIM will work to identify and strengthen tenure and governance institutions that affect uptake of innovations and technologies developed by DCL, FISH, FTA, LIVESTOCK, and WLE. Co-investment with these CRPs on governance-related research will enable comparative analyses across resource systems and countries.

Research partnerships with the International Association for the Study of the Commons, leading universities (Arizona State University, Norwegian University of Life Sciences, and Utrecht University), and external partners such as the World Bank and World Resources Institute will continue.

Flagship 5 partners with leading **regional and global action networks** (Access Initiative, Consumer Goods Forum, Global Land Tools Network, International Alliance of Indigenous and Tribal Peoples of Tropical Forests, International Land Coalition, Rights and Resources Initiative, Tropical Forest Alliance 2020). The team is involved in global processes promoting land governance, working with FAO on implementation of the Voluntary Guidelines for Responsible Governance of Tenure, on the 2015 report "Water for food security and nutrition" of the High-Level Panel of Experts on Food Security and Nutrition, and in regional processes such as the African Union Land Policy Initiative (AU-LPI). In Phase 1, PIM researchers worked to

equip the AU-LPI pilot initiative to improve monitoring and evaluation of the impact of land tenure reforms. Other platforms for exchanging knowledge and scaling out results include the CCAFS multistakeholder platforms in West Africa, and the CAPRI community of practice. Flagship 5 will strengthen ties to NARS and farmer organizations in CGIAR countries of collaboration through GFAR. Consultations with customary authorities and local government officials will be pursued through national governments, NGO, and CSO partners (for example Foundation for Ecological Security, India). Interactions with the private sector will be strengthened through collaboration with CGIAR and NGO partners that have existing relationships with private entities, such as CIFOR and FTA.

### **2.5.1.8 Climate change**

Issues of tenure are intimately linked with climate change, on both the adaptation and mitigation agendas. Tenure security influences adoption of climate-smart agricultural (CSA) practices, especially those with long-term time horizons, such as tree planting, water management, and soil carbon improvement. Conversely, forest fires in Indonesia are associated with insecure tenure situations where forest communities are afraid of losing their land. Early REDD+ and carbon payment schemes focused on beneficiaries with clear statutory ownership of the land, thereby excluding many women and members of indigenous forest communities who had customary land rights but lacked ownership recognized by the state. CIFOR's research on tenure and REDD+ under Flagship 5 will explore mechanisms by which those with customary claims to land can participate in benefit sharing.

Climate change interferes with provision of ecosystem services (including carbon sequestration, water flows, biodiversity, wild fisheries, and pollination services). Many climate adaptation measures, such as engineering interventions to improve the storage and regulation of water for commercial agriculture, create a risk of inadvertently weakening ecosystem services that the poor rely on disproportionately. Work on landscape governance in Cluster 5.2 will incorporate mechanisms to gather insights from different stakeholders to understand and manage trade-offs with regard to ecosystem services in pursuit of adaptive and mitigating measures.

### **2.5.1.9 Gender**

The rights of women to assets, including natural assets, have been a major focus of PIM's gender work in Phase 1, and this focus will continue in Phase 2 (see Flagship 6 narrative). By understanding the constraints that poor women face in securing access to land, water, and other resources and identifying mechanisms to strengthen women's property rights, **Cluster 5.1** contributes directly to Gender-equitable control of productive assets and resources (Sub-IDO CC2.1.1). The work extends beyond legal reform to encompass the remit of customary authorities and power and patriarchal attitudes that hinder improvements in women's rights.

The interaction between gender and age is particularly relevant for the work on tenure. Efforts to assure that aging widows retain rights to their land can have the unintended consequence of limiting access of young people to land and constraining shifts in use to more productive and higher-valued agriculture. Inclusive reforms in property rights that address interests of women of all ages and young men require different perspectives than a narrow focus on gender and tenure. Research in this cluster will also address the challenges of intergenerational transfer of property rights, together with colleagues working in Flagship 2 on inclusive rural transformation and youth employment.

**Cluster 5.2** will explore institutional arrangements that best facilitate participation of women and young people in decisions about resource use within their communities. Particular attention will be accorded to negotiations with private investors that have bearing on use of community or common resources.

### ***2.5.1.10 Capacity development***

Capacity development activities in Flagship 5 map to the following elements of the CapDev framework:

- **Learning materials and approaches (Element 2):** The flagship will provide training on tools developed for NGOs and community-based organizations, government agencies, NARS, SROs, and private investors. These efforts draw on CAPRI's experience in providing modular trainings via boundary partners, such as training villagers through the Foundation for Ecological Security and online courses through the International Association for the Study of the Commons. The resource center in Cluster 5.2 will include webinars, videos, practitioners' guides, and updates of the [CAPRI Sourcebook](#).
- **Gender-sensitive approaches throughout capacity development (Element 5):** Gender-based differences and gender dynamics are addressed in all research activities, and lessons from this work will be integrated into tools, learning materials, and work with partners.
- **Institutional strengthening (Element 6):** Partnerships for research, governance, and advocacy are key to this flagship. Action research programs will contribute to the capacity of researchers, government agents, and civil society to engage in dialogues on tenure policy and landscape governance. National research organizations and policy makers will be engaged in research planning and implementation. The ongoing contribution of Flagship 5 to several African initiatives through ILC and the AU-LPI Network of Excellence on Land Governance in Africa will continue.
- **Capacity to innovate (Element 10):** This flagship is characterized by collaborative and participatory research, including action research with communities, political actors, and other key decision makers. Disparate partners brought together to address common challenges are more likely to devise innovative solutions than are researchers alone or parties sharing the same perspectives and experience.

### ***2.5.1.11 Intellectual asset and open access management***

In accordance with the CGIAR guidelines on intellectual asset and open access management, and with the policies of the lead Center and its partners, Flagship 5 will ensure access to its intellectual assets in a manner that encourages access, use, replication, and adaptation of its research while safeguarding the privacy of participants and protecting confidential and proprietary information. Survey data will be made available through Dataverse after appropriate anonymization. Maps and qualitative data will require more careful screening to ensure confidentiality. Flagship 5 encourages the use of its data, toolkits, and publications through the PIM and Participating Centers' websites, and other outlets such as the [Collaborating for Resilience website](#). CAPRI Working Papers provide an early, open access outlet for findings. The [CAPRI website](#) will be arranged as a virtual resource center, with links to the various Flagship 5 studies, papers, and websites, and cross-posting on the [Land Portal](#).

### **2.5.1.12 FP management**

The Flagship 5 management team includes **a flagship leader, and leaders for each of the two clusters.**

**The role of flagship leaders will be expanded in Phase 2 relative to Phase 1**, especially with regards to coordinating inputs from participants, reporting on flagship-level progress and budget execution, and tracking outcomes and impact. The flagship management team will be funded for one third of FTE for oversight of the flagship. PIM will also cover the cost of a flagship management support function (to help with formulation of annual work plans, tracking of deliverables, and reporting) up to 50% FTE by flagship.

Because of the large number of external partners in Flagship 5, and drawing on the past practice of the CAPRI program, an **advisory group of CGIAR and external partners** will provide input to the flagship leader regarding work programs, linkage with implementation partners, and other matters.

The Phase 1 leader of Flagship 5 has led the preparation process for Phase 2. Flagship leaders for Phase 2 were selected in July, 2016 through a transparent merit-based process. The PIM Management Committee approved TORs for the positions and selection criteria including experience and excellence in the field (as measured through records of ISI publications and evidence of contribution to policy and other PIM outcomes), demonstrated ability to raise funds and attract strong research and implementation partners, and managerial experience. Staff from all Participating Centers and selected external partners were invited to nominate candidates. Self-nominations were allowed. A selection panel consisting of two SPAP members, one external partner, one representative of the Lead Center, and one representative of the PMU assigned scores to the nominees. As a result of this process, Flagship 5 will be co-led by **Steve Lawry of CIFOR and Ruth Meinzen-Dick of IFPRI** (CVs in Annex 3.8). Both will serve on the Management Committee, with a shared vote and option to rotate attendance. Cluster leaders will be chosen by September, 2016 through a participatory process led by the appointed flagship leaders.

## 2.5.2 Flagship Budget Narrative

### 2.5.2.1 General information

CRP Name	Policies, Institutions, and Markets
CRP Lead Center	International Food Policy Research Institute
Flagship Name	Flagship 5: Governance of Natural Resources
Center location of flagship leader	CIFOR and IFPRI (co-leadership)

### 2.5.2.2 Summary

Total Flagship budget summary by sources of funding (USD)

Funding Needed	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Total
W1+W2	2,330,000	2,330,000	2,399,900	2,399,900	2,471,897	2,471,897	14,403,594
W3	896,000	896,000	922,880	922,880	950,566	950,566	5,538,893
Bilateral	13,260,629	13,260,629	13,658,448	13,658,448	14,068,202	14,068,202	81,974,560
Other Sources							0
	16,486,629	16,486,629	16,981,228	16,981,228	17,490,665	17,490,665	101,917,047

Funding Secured	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Total
W1+W2 (Assumed Secured)	2,330,000	2,330,000	2,399,900	2,399,900	2,471,897	2,471,897	14,403,594
W3	0	0	0	0	0	0	0
Bilateral	2,940,472	1,940,711	970,356	441,071	0	0	6,292,610
Other Sources							0
	5,270,472	4,270,711	3,370,256	2,840,971	2,471,897	2,471,897	20,696,204

Funding Gap	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Total
W1+W2 (Required from SO)	0	0	0	0	0	0	0
W3 (Required from FC Members)	-896,000	-896,000	-922,880	-922,880	-950,566	-950,566	-5,538,893
Bilateral (Fundraising)	-10,320,158	-11,319,918	-12,688,093	-13,217,378	-14,068,202	-14,068,202	-75,681,951
Other Sources (Fundraising)	0	0	0	0	0	0	0
	-11,216,158	-12,215,918	-13,610,973	-14,140,258	-15,018,768	-15,018,768	-81,220,844

## Total Flagship budget by Natural Classifications (USD)

	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Total
Personnel	6,126,580	6,126,580	6,310,378	6,310,378	6,499,688	6,499,688	37,873,294
Travel	1,007,296	1,007,296	1,037,515	1,037,515	1,068,640	1,068,640	6,226,905
Capital Equipment	0	0	0	0	0	0	0
Other Supplies and Services	4,038,268	4,038,268	4,159,416	4,159,416	4,284,199	4,284,199	24,963,768
CGIAR collaborations	0	0	0	0	0	0	0
Non CGIAR Collaborations	3,415,228	3,415,228	3,517,685	3,517,685	3,623,215	3,623,215	21,112,259
Indirect Cost	1,899,256	1,899,256	1,956,233	1,956,233	2,014,920	2,014,920	11,740,821
	16,486,628	16,486,628	16,981,227	16,981,227	17,490,662	17,490,662	101,917,047

## Total Flagship budget by participating partners (signed PPAs) (USD)

	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Total
IFPRI	10,606,629	10,606,630	10,924,828	10,924,829	11,252,573	11,252,572	65,568,063
Biodiversity	735,000	735,000	757,050	757,049	779,762	779,761	4,543,623
CIFOR	2,099,999	2,099,999	2,162,999	2,162,999	2,227,890	2,227,890	12,981,780
ICRAF	839,999	839,999	865,199	865,199	891,156	891,156	5,192,712
ICRISAT	315,000	315,000	324,449	324,449	334,183	334,183	1,947,266
ILRI	314,999	314,999	324,450	324,450	334,184	334,183	1,947,267
IWMI	735,000	734,999	757,049	757,049	779,762	779,761	4,543,624
WorldFish	840,000	840,000	865,199	865,200	891,156	891,155	5,192,712
	16,486,626	16,486,626	16,981,223	16,981,224	17,490,662	17,490,661	101,917,047

Explanations of these costs in relation to the planned 2022 outcomes

Work in Flagship 5 seeks to identify actions that can strengthen tenure rights of poor and marginalized people – particularly women – and communities; improve governance of natural resources; and enhance institutional arrangements within shared landscapes that can lead to more sustainable and inclusive outcomes.

Given the participation of many Centers in this flagship, it is likely that temporary interruptions of spending may be observed owing to personnel changes in Participating Centers and delays in hiring. In such cases, discussions will be held between the Program Management Unit and the Participating Center to determine whether the flagship leader should be involved in the hiring processes, whether the funding should be reallocated to other activities, etc. Other risks to spending mentioned in the program-level budget narrative apply to Flagship 5.

**2.5.2.3 Additional explanations for certain accounting categories**

**Benefits:** Benefit costs primarily include leave, health, and pension costs. The costs are pooled and allocated over a base consisting of total labor. The benefit pool divided by total labor creates the rate applied to labor. For most partners, the benefit rate used in this budget was the benefit rate for the Lead Center, i.e. 58.5%.

**Other supplies and services:** The “Supplies and services” category represents about 28% of the direct costs. This category includes field surveys; research support; cost-shared services for IT and other; workshops and training, including capacity development, meetings and conferences; editing and publications; miscellaneous charges such as copying and fax; a few partners also include benefits in this category.

#### 2.5.2.4 Other sources of funding for this project

The large bilateral/W3 donors for Flagship 5 in Phase 1 are **DFID, GIZ, IFAD, the Netherlands, Norway, USAID, and the World Bank**. Discussions are continuing with all of them for Phase 2, and discussions have started with Omidyar Network and Packard Foundation.

#### 2.5.2.5 Budgeted costs for certain key activities

	Estimate annual average cost (USD)	Please describe main key activities for the applicable categories below, as described in the guidance for full proposal
Gender	5,976,403	See below and flagship narrative
Youth (only for those who have relevant set of activities in this area)	1,648,663	See below and flagship narrative
Capacity development	2,472,995	See below and flagship narrative
Impact assessment	494,599	See below and flagship narrative
Intellectual asset management	0	See below and flagship narrative
Open access and data management	0	See below and flagship narrative
Communication	602,032	See below and flagship narrative

**Gender:** The gender component of Flagship 5 is derived by assigning a gender percentage to each of the Sub-IDOs that the flagship contributes to (see Table C of the Performance Indicators Matrix). For the Sub-IDOs under IDO CC2.1 on Equity and inclusion achieved, the gender percentage is assumed to be 100%. Using this methodology, the Flagship 5 **gender budget for 2017** is estimated at **\$6.0M**, which represents **36%** of the total flagship budget. Key gender activities in Flagship 5 are described in Section 2.5.1.9 of the Flagship 5 narrative.

**Youth:** For this flagship the level of intensity in addressing youth issues is estimated at **10%**, that is **\$1.6M in 2017**. The contribution of Flagship 5 to PIM’s youth strategy is described in Annex 3.5.

**Capacity development:** The capacity development component of Flagship 5 is derived by adding up the flagship contributions to the capacity development Sub-IDOs, i.e. Sub-IDOs CC2.1.1, CC3.1.3, CC4.1.2, and CC4.1.4 (see Table C of the Performance Indicators Matrix). It is assumed that the flagship’s contributions towards other Sub-IDOs do not count as capacity development. Using this methodology, the Flagship 5 **capacity development budget for 2017** is estimated at **\$2.5M**, which represents **15%** of the total Flagship 5 budget.

**Impact assessment:** The impact assessment budget is estimated to be **3%** of the flagship budget, for a total of **\$495K in 2017**. Examples of activities counted in this budget are: assessments of land tenure reform effects on farm investment that will feed into impact assessment of PIM research; assessment of governance outcomes.

**Open access and data management:** PIM is fully committed to complying with the CGIAR Open Access and Data Management (OADM) Policy and its Implementation Guidelines. Major infrastructures and staff required to do so are covered through overhead costs charged by the Centers, and include: maintenance of digital content collections; Online Public Access Catalog (OPAC)/library catalog systems; website development related to repositories; promotion and training in support of OA/OD. Additional costs specific to PIM research activities (essentially OA fees for journal articles) are budgeted for at project level under Supplies and Services.

**Intellectual asset management:** As explained in Annex 3.10 of the proposal narrative, the budget for IA management is the same as the budget for OA management (see above).

**Communications:** As described in PIM's Communications Strategy, flagship leaders will appoint a staff member responsible for liaising with the Program Management Unit, participating in the PIM communicators group, and supporting the flagship's communications activities, which include: contributions to the PIM newsletter and blogs; organizing knowledge sharing and capacity building events on the topics of the flagship research; representing PIM at local/regional events; and supporting application of the PIM Branding and Acknowledgement Guidelines at flagship level. It is estimated that these tasks will represent 0.3 FTE of a Communications Specialist, or about \$25K annually per flagship. In addition, Supplies and services include communications-related items, among which publications and workshops; these items are estimated to represent 3.5% of the flagship budget i.e \$577K in 2017. The total is **\$602K (3.7%** of the total Flagship 5 budget).

#### **2.5.2.6 Other**

Please disregard the FTE allocations columns in the budget template (the computation of this item is not appropriate for an aggregated presentation of the personnel costs). The approximate number of FTE (average across years) for this flagship is 25. See Annex 3.8 for the CVs of the core members of the flagship team.

The total time dedicated to the **flagship coordination activities** is estimated at about 30% FTE. Following the guidance in the case when this percentage is below 50%, the corresponding costs are included in the flagship budget. PIM will also cover the cost of a flagship management support function up to 50% FTE by flagship; the corresponding costs are included in the program management costs.

There are no plans to purchase capital equipment.

### 2.5.3 Flagship Uplift Budget

Outcome Description	Amount Needed	W1 + W2 (%)	W3 (%)	Bilateral (%)	Other (%)
Evidence informs natural resource governance and tenure policy processes/implementation in 2 additional countries, including 1 additional CGIAR country of collaboration (includes capacity development)	2,000,000	0	0	0	0
Tenure security is improved for beneficiaries in 1 additional country, with detailed documentation (includes capacity development)	1,500,000	0	0	0	0
Improved landscape-level governance arrangements lead to more productive and equitable management in 1 additional country, with detailed documentation (includes capacity development)	1,500,000	0	0	0	0

## 2.6 Flagship 6: Cross-cutting Gender Research and Coordination

### 2.6.1 Flagship Project Narrative

#### 2.6.1.1 Rationale, scope

Reducing gender disparities is recognized to contribute to agricultural growth and rural development (see the FAO 2011 State of Food and Agriculture report, the World Bank's 2012 World Development Report, and the GCARD 2010 Conference and subsequent GCARD Roadmap). Accordingly, for CGIAR to deliver on its mission as stated in the Strategy and Results Framework (SRF) and to address the SRF grand challenges, its work must engage and empower women. Progress toward gender equity enhances inclusion, and promotes effective development. Gender bias contributes to underlying causes of all of the grand challenges. Among these, the work of Flagship 6 most directly addresses **competition for land** and **overdrawn water supplies** (through addressing gender bias in control of and access to these resources); **climate change** (through enhancing men's and women's understanding of its effects, and ability to adapt); **nutritious and healthy diets** (through women's roles in production for home consumption and dietary choices); and **employment opportunities** (especially for young women seeking to manage farms and eager for rural nonfarm employment). Meeting these and other challenges will in each case require attention to gender equity and empowerment of women.

**Gender research is accordingly given prominence as a flagship in PIM in Phase 2.** The cross-cutting gender activities formerly housed within the PIM "management and cross-cutting functions" budget line will expand and become Cluster 6.1, and the CGIAR Collaborative Platform for Gender Research (Gender Platform) will be Cluster 6.2. Cluster 6.1 will include research on specific topics to complement the gender work undertaken within the other five PIM flagships and with other CRPs. Cluster 6.2, the Gender Platform, will strengthen the capacity of work on gender across CGIAR and develop frameworks for research so that the work of individual Centers and CRPs can better contribute to a common understanding of gender issues across a range of contexts.

**Selectivity and focus of the work in Flagship 6 is informed by a growing body of empirical evidence on gender and agriculture** summarized below:

- Although women comprise a significant fraction of the workforce in the agricultural sector, their productivity remains low due to their lack of control over assets and labor (O'Sullivan et al. 2014).
- If inequality in control over resources can be overcome, women farm as productively as men (Quisumbing 1996). Other authors (Aguilar et al. 2015; Backiny-Yetna and McGee 2015; Kilic et al. 2015; Oseni et al. 2015; Slavchevska 2015) find, on the other hand, that women receive lower returns to land and other inputs even when they have access to these resources.
- Increasing the amount of production and income under control of women improves food security more than similar increases in production and income controlled by men.
- Involving women as well as men in resource management improves outcomes for sustainability, due to different interests and complementary skills of women and men (Agarwal 2010; Pandolfelli, Meinzen-Dick and Dohrn 2008).
- Gender-based barriers to women's participation in formal and informal markets, particularly women's overall lack of integration in commercial agriculture, reduce women's ability to earn and control incomes within their households, and deny them the opportunity to realize returns to investment in their human capital.
- Involvement of women in policy-making processes, from the local to the national level, is associated with public expenditure allocations that favor investments in social infrastructure, such

as water supply and schools (Chattophadyay and Duflo 2004).

- Analysis of the findings of early applications of the [Women's Empowerment in Agriculture Index \(WEAI\)](#) in 13 countries reveals that reported constraints are greatest in the areas of decision making about credit, time allocation and excessive workloads, and low membership in groups, although there are significant variations across contexts (Malapit et al. 2014).

The work of Flagship 6 builds on these empirical findings, and particularly the **conflicting findings of gender and productivity**. A better understanding of how gender constraints affect productivity is very important for the work of PIM and for CGIAR as a whole. **Interventions to increase women's empowerment** constitute a second area of emphasis. As empirical measurement of empowerment is improved with application of the WEAI, assessment of the effectiveness of interventions becomes more firmly grounded empirically. A third area of focus is the **impact of rural transformation on women of all ages**.

Flagship 6 addresses the following **research questions**:

- **How do access to and control over inputs and resources affect productivity of men and women, and what other factors might explain observed differences in productivity?**
- **How can interventions improve women's empowerment and agricultural outcomes for women and families?**
- **How do different drivers of agricultural transformation affect gendered roles in agriculture?**
- **How can the separate studies and approaches to gender analysis throughout CGIAR reinforce each other, and contribute to a coherent contribution to attainment of the SLOs?**

**The geographic coverage of Cluster 6.1 includes *inter alia* Bangladesh, Benin, Burkina Faso, Ethiopia, Ghana, India, Malawi, Myanmar, Nigeria, Senegal, and Uganda.** Not all of the work in these countries will entail primary data collection. Work related to several countries will be based on existing datasets that can be re-examined for insights into gender roles. **The scope of Cluster 6.2 (the Gender Platform) is global.**

### **2.6.1.2 Objectives and targets**

The work of Flagship 6 is designed to contribute to specific items of the SRF (discussed below). In addition, Flagship 6 aims to influence the way CGIAR researchers conceptualize the importance of gender in their research, and to provide them with tools and methods for high-quality gender research. Success in positioning gender analysis more centrally in the CGIAR portfolio will require coherence and visibility of the work, rigor of analysis, clear relevance to the applied work of the CRPs and partners, and recognition of the researchers.

**Cluster 6.1 on Gender, Agricultural Productivity, and Rural Transformation** has the following objectives:

- Strengthen research methods and undertake selected studies on cross-cutting topics not addressed within the flagships around gender dimensions of agricultural productivity, empowerment, and growth and transformation.
- Integrate gender research across the PIM flagships: e.g., synthesize results on barriers to women in access to technologies (Flagship 1), value chains (Flagship 3), and natural resources (Flagship 5), understand how structural transformation and public expenditure decisions affect opportunities for women, both young and old (Flagship 2), examine the role of social protection in addressing gender dimensions of vulnerability (Flagship 4).
- Establish priorities for gender research within PIM (in collaboration with the Gender Platform).

**Cluster 6.2 on the CGIAR Collaborative Platform for Gender Research** has the following objectives:

- Increase the visibility of gender research within CGIAR, and raise appreciation for how understanding of gender increases the impact of agricultural research for development.
- Assess priorities for gender research across CGIAR, identify the extent to which such priorities are being addressed, and identify gaps.
- Support knowledge-sharing to promote joint approaches and methods for integration of gender into technical research areas such as crop and livestock improvement and climate science, and scaling out gender-responsive or transformative innovations.
- Foster adherence to minimum standards for sex-disaggregated data collection, including access to and exchange of expertise and materials across programs.
- Establish common approaches to gender-responsive M&E and measurement of gender dimensions of development outcomes.
- Foster and catalyze strategic partnerships on gender and capacity strengthening within CGIAR and with local development partners to enhance the impact of agricultural research for development.

Flagship 6, through PIM research in Cluster 6.1 and the functions of the Gender Platform, contributes directly to the Sub-DOs noted in Table 2.6.1.2.1.

**Table 2.6.1.2.1: Contributions of Flagship 6 to the CGIAR Sub-DOs**

Sub-DOs	Relative contribution (%)
CC2.1.1 Gender-equitable control of productive assets and resources	20
CC2.1.2 Technologies that reduce women's labor and energy expenditure developed and disseminated	10
CC2.1.3 Improved capacity of women and young people to participate in decision making	10
CC3.1.3 Conducive agricultural policy environment	20
CC4.1.1 Enhanced institutional capacity of partner research organizations	15
CC4.1.2 Enhanced individual capacity in partner research organizations through training and exchange	25
Total	100

Investment in the capacity development Sub-DOs is high (50% in total) due to the hosting of the Gender Platform and the emphasis on tools and methods in Cluster 6.1.

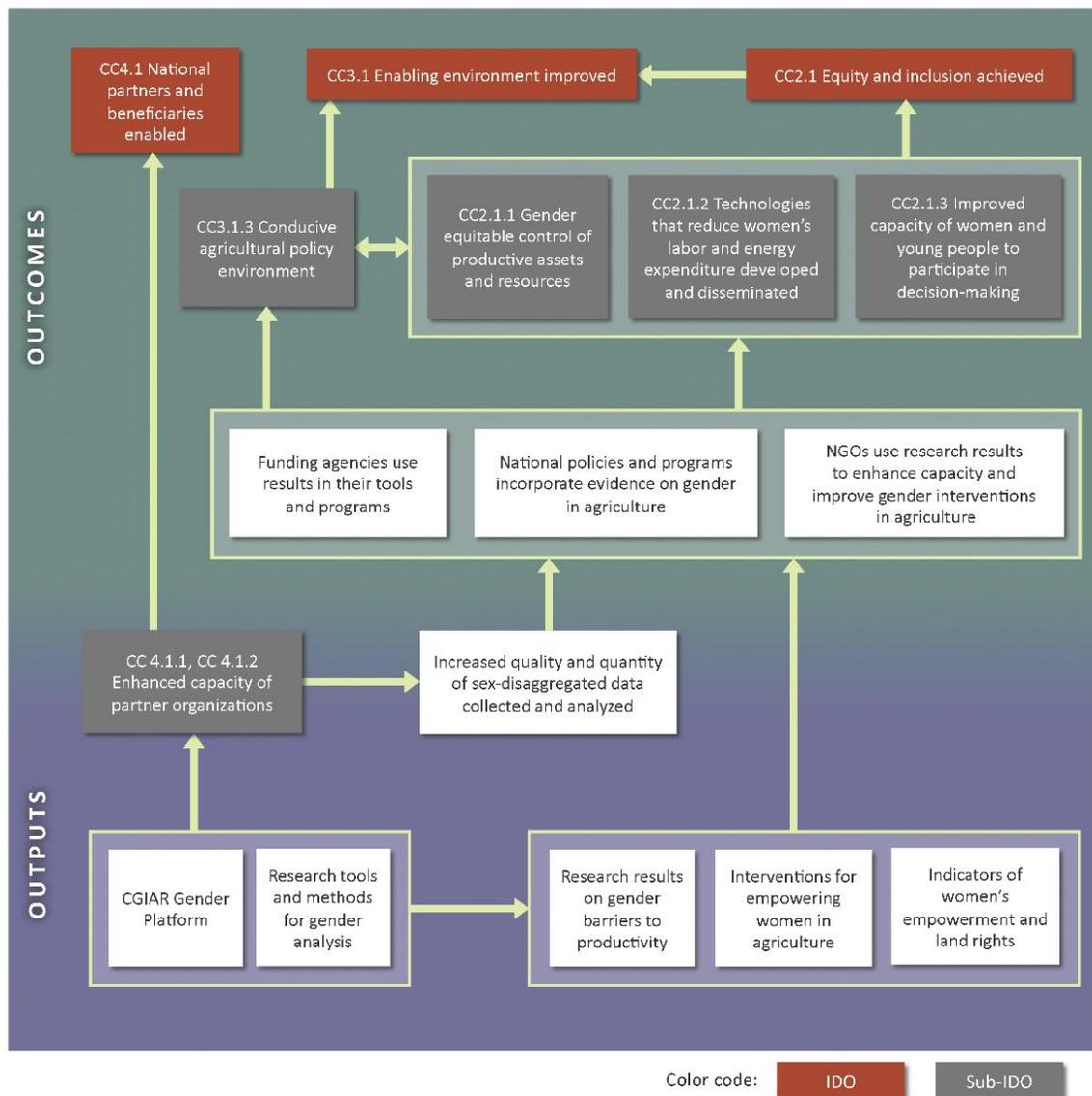
**Specific outcomes of Flagship 6** include:

- **National researchers use improved gender research methods** (in five CGIAR countries of collaboration by 2022). Better prioritization and coordination of gender research in CGIAR leads to innovations making research more gender-responsive and gender-transformative, and improved capacity in gender research of researchers within CGIAR and in partner organizations.
- **Gender dimensions of policies are strengthened** (in four CGIAR countries of collaboration by 2022). Agriculture and gender-focused strategies and policies are informed by improved evidence on the role of gender in agriculture and rural development. Agriculture and gender-focused programs use tested interventions that promote inclusion of men and women and empower disadvantaged groups, leading to reduced gender inequalities.
- As a result, **the value of indicators of women's empowerment in agriculture increases** (in three CGIAR countries of collaboration by 2022).

### 2.6.1.3 Impact pathway and theory of change (for each individual FP)

The theory of change underlying PIM’s gender research is nested within the general theory of change for PIM presented in Figure 1.0.3.1. **The major constraint addressed relates to restrictive gender norms, rules, and practices.** The theory of change rests on the **assumptions** that: (a) improved data and understanding of how gender biases affect outcomes and how the biases can be mitigated will influence decision makers, including development partners, to push for change in attitudes, behaviors, rules, and institutions that sustain the barriers; and (b) remedies for constraints affecting women must be assessed in a context that includes other dimensions of identity, such as age, ethnicity, location, and role within the household. The research team engages with all four mechanisms of influence of PIM (see Section 1.0.3), including at the global, regional/national, and local levels, and through capacity development. Outcomes include *inter alia* repeal of restrictive laws or measures, improved access of women to assets and markets, and empowerment of men and women to approach opportunities differently. Specific impact pathways are described in Figure 2.6.1.3.1.

Figure 2.6.1.3.1: Impact pathways for Flagship 6



The dynamic between and among national stakeholders, researchers, and development agencies with regard to gender is relevant to the theory of change. **National development programs and policies frequently have blind spots with regard to gender**, simply because traditional gender roles are embedded in the fabric of society. Development agencies, in contrast, often require explicit recognition of gender in programs that they fund. Their partnership with governments can elevate the importance of gender, and serve as a counterweight to the inertia of tradition. At the same time, broad policies of the development agencies may require adaptation to local context. Researchers can assist with this task. **The influence that development partners wield on gender issues through the design of programs makes them particularly important in the mechanism of change and a key client group in the impact pathway for gender research.** Effective communication about how gender research leads to empowerment and how empowerment contributes to countries' objectives can also contribute to realization of impact.

**Two impact pathways are depicted in Figure 2.6.1.3.1: one showing the direct effects of research, and the other showing the indirect effects through capacity building and development and use of tools and methods.**

Within the first pathway, research will focus on identifying gender barriers in agricultural production and ways to overcome them; testing interventions that promote inclusion and empowerment of men and women; and improving indicators of women's empowerment and land rights. Flagship 6 will also support related studies in other flagships, and draw summary lessons, including linkages to climate change (see description of gender studies on energy-efficient innovations and weather-based insurance in Section 2.6.1.6). The results of these studies will provide evidence that will be incorporated into advocacy, interventions, policies, and programs. PIM actively disseminates information through high-quality publications and briefs, and other media such as the EnGendering Data blog.

The second pathway focuses on improving research methods, so that other researchers will generate more high-quality gender studies. The capacity strengthening pathway is based on the excellent track record of PIM in Phase 1 in both methods development and training of researchers, as evidenced by methods and guidelines produced, training sessions organized, and a strong role in networking within CGIAR. The addition of the **Gender Platform** to PIM's portfolio greatly enhances the program's exposure to many partners that are conducting high-quality work, including CGIAR Centers, other CRPs and their hundreds of NGO and CSO partners, women's groups, research networks, etc. The outreach of the Platform will benefit from retaining the strong gender communications team of the current CGIAR Gender Network. **The Platform will also increase PIM's level of investment in capacity building**, especially through the partnership with African Women in Agricultural Research and Development (AWARD) – which is highly regarded for its mentoring and training of women scientists. PIM works with the International Rescue Committee (IRC) and the World Bank's Gender Innovation Lab and Living Standards Measurement Study (LSMS) teams to integrate improved data collection methods into large survey instruments. PIM will continue to support the mutually beneficial partnership with FAO on disseminating good practices in collection of sex-disaggregated data. This partnership capitalizes on PIM's expertise in developing indicators, and FAO's ability to make recommendations to national statistical agencies.

The contribution of Flagship 6 to the cross-cutting Sub-DOs listed in Table 2.6.1.2.1 will have knock-on effects on a large number of DOs (other than the cross-cutting ones) contributing to the SDOs. For example, past research of FAO (2011) and the World Bank (2011) finds that reducing gender gaps increases productivity (DO 1.4), and improves diets for poor and vulnerable people (DO 2.1). Analyses of the WEAI highlight linkages between women's empowerment and increased productivity and food security (Alkire et al. 2013; Sraboni et al. 2014; Malapit and Quisumbing 2014; Malapit et al. 2013).

Flagship 6 also has indirect effects through support of other PIM flagships and, through the Platform, of other CRPs. Figure 2.6.1.3.1 shows only the main linkages to IDOs CC2.1, CC3.1, and CC4.1.

### **2.6.1.4 Science quality**

The quality of science in Flagship 6 is assured through the technical strength of staff working on the topics, the ability of the program to take an integrative view across flagships and CRPs, and the quality of partnerships. **The strength of PIM's gender work in Phase 1 has been confirmed by the external evaluation of PIM, and the request from the ISPC that PIM host the Gender Platform in Phase 2.**

During Phase 1, PIM made an integrative contribution to the CGIAR Gender Network. PIM convened and hosted meetings of the network, and **developed materials for use throughout CGIAR**, such as the [guidelines for collecting sex-disaggregated data](#). PIM has also created [EnGendering Data](#), a blog on collecting and analyzing sex-disaggregated data. The **Women's Empowerment in Agriculture Index (WEAI)** is a major output from the team. The WEAI was designed prior to the launch of PIM, but was supported and refined during Phase 1. It is now being used by over 35 research and development organizations.

Empirical research from Phase 1 has provided insights into a number of important areas including: (a) quantitative evidence on gender differences in landownership; (b) effects of joint ownership and joint titling of land on productivity and empowerment; (c) differential effects of climate change on men and women; (d) factors contributing to women's disempowerment; and (e) gender differences in risk preferences and implications for technology adoption.

The research outputs of PIM's Phase 1 gender research have been published in high-quality academic journals, including *Agricultural Economics* and *World Development*. The papers have been presented at a range of international conferences (International Association for Agricultural Economics, Population Association of America, the World Bank Conference on Land and Poverty).

Senior staff working on gender research within PIM are highly regarded (see CVs of Flagship 6 core staff in Annex 3.8). The leader of Flagship 6 is a member of the PIM Management Committee. A full-time coordinator for the Gender Platform, with strong skills in research and capacity building, will be selected in the summer of 2016, and will be a member of the Management Committee. In addition to the senior staff, the PIM gender team includes a number of talented junior researchers whose CVs are not included in Annex 3.8 due to limits of space. The team brings particularly strong **quantitative skills**, with experience using mixed methods.

The coordinator of the Gender Platform will work closely with the broader gender team in PIM and throughout CGIAR. In addition, the Gender Platform will draw on the strong mentoring and capacity building skills of AWARD. The communications and knowledge sharing components of the CGIAR Gender Network developed by CIAT will be integrated to the Platform.

**PIM's strong partnerships with national and global research organizations, aid agencies, IFIs, NGOs, and foundations, such as the Ethiopian ATA, FAO, the Oxford Poverty and Human Development Initiative, USAID, the World Bank, and WVI contribute to the methodological rigor of the gender research and its relevance to applications.** The team works closely with the International Rescue Committee and the World Bank's Gender Innovation Lab and LSMS team to conduct methodological experiments to improve

the measurement of men's and women's time use, control over assets, and agency, three key constructs in women's empowerment. The Gender Innovation Lab leads rigorous evaluations of the impacts of interventions aimed at closing the gender gap in productivity, earnings, assets, and agency. The LSMS team implements nationally representative household surveys, and has experience designing experiments to test how the choice of survey respondent affects responses, such as the work conducted as part of the Methodological Experiment on Measuring Asset Ownership from a Gender Perspective (MEXA).

The empirical research in Flagship 6 will use **a range of quantitative, qualitative, and mixed methods**. A number of studies will use randomized control trials (RCTs) to evaluate the impact of various interventions on gender-related outcomes. RCTs allow identification of the specific pathways that generate impacts, and determination of whether the outcomes vary for men and women. For research questions on gender and rural transformation, econometric techniques appropriate for panel and cross-section data will be used. To consider the gendered migration and off-farm employment trends, difference-in-difference matching and instrumental variables approaches will be used to address selection issues.

Part of the conundrum in understanding gender-based productivity may relate to inadequate inclusion of contributions that men and women make jointly to productive processes reported to be under primary management by either the male or female farmer. In recent years, attention of the research community has shifted away from the unitary model of the agricultural household towards a focus on individuals within the household. This perspective has the advantage of revealing the preferences, agency, and actions of individual household members, but it obscures important interactions between men and women within the household. Research under the Gender, Agriculture and Assets Project in Phase 1 showed that most households include both elements of individual control, ownership, and decision making, and elements of "jointness" (Johnson et al. forthcoming). **Analyzing the role of gender in agricultural productivity requires new tools and methods to capture jointness in production**, and to understand its extent in different contexts. PIM's gender team will explore these topics during Phase 2.

**Innovations in collecting sex-disaggregated data build on a strong foundation.** Members of the PIM gender team led early interdisciplinary work on gender and intrahousehold welfare analysis, including the design of some of the first intrahousehold surveys. They also lead the Gender, Assets, and Agriculture Project (mapped to A4NH in Phase 2), which analyzes how to strengthen women's control and ownership of property rights. PIM's Gender Lead in Phase 1 has worked for many years on intrahousehold analyses, and led the Gender Asset Gap Project, which aims to demonstrate the importance and feasibility of collecting individual level sex-disaggregated asset data. Drawing on these experiences, PIM will develop new approaches for collecting sex-disaggregated data, including an emphasis on how to collect and analyze data on joint decision making within households.

### ***2.6.1.5 Lessons learnt and unintended consequences***

Findings from Phase 1 regarding **women's ownership of land (more common than often believed)** and from a World Bank study on **women's share of farm labor (lower than commonly believed)** reinforce the need to challenge widely held but loosely substantiated claims about gender (Doss et al. 2015; Kieran et al. 2015; Palacios-Lopez et al. 2015). An unintended consequence of empirically testing widely held beliefs is that sometimes the beliefs are shown to be unsubstantiated. The PIM team assists development agencies by presenting new understanding of the gender issues, and identifying implications for the design of interventions supported by these agencies.

A recent study of landownership in Asia finds that gender inequalities in landholdings within the household increase as households accumulate land, suggesting an agenda for future research and policy that strengthens the land rights of women within marriage (Sproule et al. 2015). One potential method of achieving this is through **joint titling**. Recent evidence from Ethiopia, South Africa, Uganda, and Vietnam explores different aspects of joint titling of land, with intriguing but fragmented findings on productivity and empowerment (Newman et al. 2015; Holden and Bezu 2013; Jacobs and Kes 2014). Examination of available data on landownership and registration in Africa and Asia shows a higher proportion of joint ownership than has heretofore been assumed (Doss et al. 2014). Research conducted under GAAP found that in Uganda the probability of adoption of orange-fleshed sweet potato was highest on parcels under joint control but where women took the lead in deciding which crops were grown, and lowest on parcels controlled solely by men (Gilligan et al. 2013). Joint titling of land is but one aspect of jointness; the implications of jointness in decision making and management are yet not fully understood.

The PIM-supported project *Enhancing Women's Assets to Manage Risk under Climate Change: Potential for Group-Based Approaches* undertaken during Phase 1 examined **how climate change differentially affects men and women**, and how group-based approaches can improve resilience to climate change. This work will inform efforts to understand adoption of technology in Phase 2.

Research on the WEAI has **enhanced understanding of how to measure women's empowerment**, and how empowerment affects maternal and child food and nutrition security in Bangladesh, Ghana, and Nepal (Sraboni et al. 2013; Malapit and Quisumbing 2014; Malapit et al. 2013). The WEAI has also helped researchers diagnose the key factors contributing to women's disempowerment. Additional work during Phase 2 in coordination with the Flagship 4 team will probe demand for and access to financial services in addition to credit.

As part of CIMMYT's Adoption Pathways project, a study analyzing the effect of men's and women's risk preferences on technology adoption in Kenya found that, while husbands and wives within the same household and across the sample did not have significantly different risk preferences, women's preferences were more correlated with seed choice than were men's (Love et al. 2015). These findings will be explored further in conjunction with Flagship 1.

Researchers will continue to promote the use of improved statistics on gender gaps in control over land in collaboration with FAO's Gender and Land Rights Database team, but the team believes that they have adequately researched the existing data on this topic. In the next phase, PIM will bring the same rigorous questioning to the work on gender and agricultural productivity to challenge other areas of conventional belief about gender.

### **2.6.1.6 Clusters of activity (CoA)**

Flagship 6 consists of two closely related clusters of work. Cluster 6.1 includes research on issues related to gender, agricultural productivity and agricultural transformation, and development of tools and methods. Cluster 6.2 is the CGIAR Collaborative Platform for Gender Research.

#### *Cluster 6.1 – Gender, Agricultural Productivity and Rural Transformation*

This cluster will address the following **research questions**:

- How do **access to inputs, resources, and other factors affect productivity of men and women?**

- How can interventions **improve empowerment of women** and agricultural outcomes for women and families?
- How do different drivers of **agricultural transformation affect gendered roles in agriculture**?

PIM will continue to analyze large sex-disaggregated datasets to explore **how access to inputs, resources, and other factors affect productivity of men and women**. For example, the Decent Work study in Egypt and Morocco provides insight into different experiences of women and men in the labor market, and probes the causes and consequences of these differences. The research will consider working conditions, the impact of concepts of “appropriate” work for men and women, working hours, payment modalities, and who controls the earned income. Inquiry into “jointness” in decision making, ownership, and production between men and women will be part of this work.

Regarding the second research question on **the role of interventions to empower women**, the team will develop a set of empirical studies around specific interventions to develop a body of high-quality evidence from which policy and program implications can be derived. An initial set of interventions have been identified in collaboration with several development and research partners, who will test them against a suite of individual and household outcomes using experimental research designs. All interventions involve at least one round of data collection, which will be funded through bilateral projects. The role of women’s access to resources will be considered in all of these projects. Coordination across the various analyses will ensure that broader lessons can be drawn. The following projects will be included:

- The Farm Balance Project in Uganda will test whether engaging women in outgrower contracts enhances women’s empowerment, bargaining, and household welfare.
- The Arikus Farms Project in Ghana examines how relaxing constraints on credit and irrigation affect women’s empowerment, bargaining, and household welfare.
- The Dairy Value Chain project in Senegal will address inefficiencies in milk production resulting from women not being directly rewarded for their efforts, and/or women not having access to information on best milk production practices. The project will explicitly test the influence of performance-based incentives and trainings targeting women on milk production.
- The mAgri program in Ghana will use a mobile platform technology to diffuse agricultural marketing information. All farmers have access to the product, but an encouragement design is used to target women in particular. The research team will evaluate how this technology affects agricultural knowledge and practices, as well as intrahousehold dynamics.
- The AfricaRice projects in Nigeria and Benin will evaluate the impact of introducing a more energy efficient threshing technology to women responsible for processing rice. The research team will evaluate the impact on agricultural practices, income, and women’s empowerment.
- Field experiments in Burkina Faso and Senegal will be used to test for gender differences in the demand for and impacts of index-based agricultural insurance and three types of commitment savings products. The project proposes to investigate whether different patterns of demand for these packages can result in welfare differences.

The analysis of **drivers of agricultural transformation and gender roles** will include study of how gendered migration and off-farm employment trends affect women’s experience and agricultural performance. In the initial work, the team will exploit datasets from Bangladesh, Ethiopia, India, Malawi, and Myanmar. The team will document gendered migration trends in all countries, followed by the use of individual data on time use, labor, and involvement in agricultural investment-related decisions. The research will support the design of policy and program interventions that promote the inclusion of both women and men in the

transition from less to more commercial agriculture, while assessing how women individually, or jointly with men, can retain control of income and other assets.

Cluster 6.1 will also **develop improved methods and tools for sex-disaggregated data collection and gender analysis**. Research conducted in Phase 1 identified not only large gender gaps in landownership and land management in Africa and Asia, but also substantial discrepancies in the way indicators on landholding are reported (Doss et al. 2014; Kieran et al. 2015). To start standardizing these indicators, FAO's Gender and Land Rights Database has adopted PIM's conceptual framework and indicators of these gaps. PIM will continue to collaborate with FAO and other partners to inform future collection of standardized data on women's land tenure and agricultural production.

Building on experience with quantitative surveys and mixed methods approaches, the team will test **innovative approaches for collecting sex-disaggregated data, such as participatory methods and use of ICT**. Knowledge of what, whom, and how to ask can save time and money in collecting data. This work will involve experiments with survey design and implementation, as well as analysis of existing datasets to identify what can be learned with existing approaches, especially around issues of asset ownership and control, time use, and women's agency. Attention will be accorded to heterogeneity in age, marital and socioeconomic status, religion, and location, among other factors.

To improve methods for measuring women's empowerment, and to enhance understanding of the relationship between women's empowerment and agricultural productivity, refinement of the WEAI will continue. IFPRI has recently revised the WEAI questionnaire, and used cognitive testing in Bangladesh and Uganda to pilot an improved version of the index. Availability of midline and endline data from the WEAI will allow continued testing of the validity of the tool. New applications will be explored, particularly in the realm of technology adoption and agricultural productivity.

The **outputs of Cluster 6.1** include:

- Insights into the gender gap in productivity, and assessments of interventions to reduce it.
- Policy recommendations to increase inclusiveness of rural transformation and improve opportunities for women and girls in transforming countries.
- Open-access datasets, innovative methods for gender analysis, methodological guidelines, and training.

#### *Cluster 6.2 – CGIAR Collaborative Platform for Gender Research*

Cluster 6.2 builds on the current **CGIAR Gender Network**. The Platform will increase the visibility of gender research within CGIAR, and develop common research frameworks and methods in order for the research of individual centers and CRPs to better contribute to an overall body of knowledge. It will support the integration of gender into technical research areas, such as crop and livestock improvement, climate science, etc., and encourage sharing of information about gender-responsive or transformative innovations operating at scale.

A review of the gender strategies and gender research questions of all CRPs in Phase 2, with particular attention to areas of complementarities, overlap, and gaps, and building on prior work by the CGIAR Gender Network, will produce **an inventory of gender methods and outputs by CRP and country**. This assessment will consider the likely contributions to the gender-related Sub-IDOs:

- Sub-IDO CC2.1.1 Gender-equitable control of productive assets and resources: Which productive assets and resources are being targeted, and where? What are the opportunities for coordination

between CRPs to create synergies; for example, between control of land and adoption of new technologies?

- Sub-IDO CC2.1.2 Technologies that reduce women’s labor and energy expenditure developed and disseminated: The inventory of technologies and estimates of their likely adoption and impact will allow the team to identify remaining gaps, and barriers to be addressed to encourage adoption. What are the promising methodologies developed under each CRP, and what is the potential for learning across different interventions?
- Sub-IDO CC2.1.3 Improved capacity of women and young people to participate in decision making: What types of decisions matter most for women and young people? How does their participation change outcomes?

In areas where the inventory of methods and outputs indicates important gaps, the Platform will work with CRPs to see how they can be addressed. Building on this inventory, the Platform will host discussions within CGIAR and the **GFAR-convened Gender in Agriculture Partnership (GAP)** to act on areas of synergies and opportunities for achieving greater impact at CGIAR level. **Consultations with NARS and women’s organizations** in CGIAR countries of collaboration will provide complementary information on these organizations’ current needs, priorities, capacity, and research agendas.

The Platform will identify ways in which researchers can frame and coordinate their work both to answer specific research questions and to contribute to a broader body of knowledge on gender and agriculture. **Greater collaboration among researchers on data collection** will be fostered, based on similar ways of asking questions and defining variables. In addition, researchers will be encouraged to design their samples so that the results are representative and can be compared across studies. Approaches to data collection will draw on quantitative and qualitative methods. Qualitative methods will be used to move beyond descriptive and diagnostic research, towards research focused on how gender norms and dynamics evolve to support gender equality. The Platform will help disseminate the CGIAR guidelines for collecting sex-disaggregated data.

Depending on the availability of bilateral funds, the Platform may also lead or commission **cross-cutting analyses involving multiple CRPs, and develop frameworks or methods that can be used by multiple CRPs** (jointly with Cluster 6.1).

Building on the communication outlets established by CIAT for the CGIAR Gender Network ([CGIAR gender website](#), including links to CGIAR research outputs through the [Gender Network Dataverse](#), newsletters, progress reports on CGIAR gender research for donors and other stakeholders, webinar series), the Platform will undertake **communications** functions, including both internal knowledge sharing and external outreach. The Platform will facilitate regular interactions between its members and partners, especially through fostering online collaboration and encouraging participation in peer-assisted learning and mentoring. Collaborative spaces will be developed to stimulate collaboration on specific topics (such as gender and genomics, gender and climate change, and impact assessment) and geographies.

The Platform will conduct targeted **capacity strengthening in gender responsive research design and analysis**. It will also convene “write-shops” to **mentor researchers** (especially junior researchers and those new to gender analyses), improve scientific productivity, and ensure that the gender results of the CRPs are made available through peer-reviewed outlets. **AWARD** will help nurture emerging gender researchers by connecting them to more established senior researchers across CGIAR.

An **M&E and impact assessment plan** will be developed to monitor the outcomes of CGIAR's gender work. In partnership with USAID and the Oxford Poverty and Human Development Initiative (OPHI), and with support from PIM and A4NH, IFPRI has developed a population-based measure of the impact of USAID's Feed the Future Initiative using the WEAI, and is currently developing and testing a tailored version of the WEAI for use at project level (Pro-WEAI). The [Gender and Inclusion Toolbox](#) developed by CCAFS, CARE, and ICRAF is a promising qualitative instrument for community level needs assessment and measurement of outcomes. Other qualitative and quantitative methods for monitoring outcomes will be discussed among platform members, and with the Independent Evaluation Arrangement.

Ensuring long-lasting impacts of CGIAR's gender work requires proactive efforts to develop **strategic partnerships**. While many large development organizations have established gender guidelines and indicators for their projects, local capacity to implement the guidelines and engage in high-quality research is lacking. The Platform will help CRPs identify key international, national, and local boundary partners for the gender work (such as women's organizations, NGOs, universities, and NARS, with a focus on the CGIAR countries of collaboration). The platform website will facilitate sharing of methods, insights, and results in these countries.

The **outputs of Cluster 6.2** include:

- Inventory of gender research and tools across CRPs and identification of research priorities.
- Tools and methods.
- Web-based platform and associated trainings and communications products.

### **2.6.1.7 Partnerships**

PIM's **comparative advantage** in Flagship 6 derives from technical strength of the research team and the relevance of the work to the SLOs and the portfolio of CRPs. Within CGIAR PIM contributes new tools and methods, technical rigor in their application, and connections with the external gender communities of research and practice. In Phase 2 PIM will also provide a platform for CGIAR collaboration, including joint selection of strategic priorities for gender work system-wide. To the external community of partners, PIM's gender team provides depth in understanding of agriculture and rural development, and design of research to address major issues.

At the global level, one of the key partners for the work on developing better gender indicators is **FAO**. Following joint development of the indicators featured in FAO's Gender and Land Rights Database, collaboration now extends to identification of best practices in collecting other sex-disaggregated agricultural data. The team also collaborates with the **World Bank's Gender Innovation Lab and LSMS teams** and with **IRC** to generate better data on gender-informed development indicators in order to track progress in promoting gender equality, design interventions to address gender-based constraints, and rigorously evaluate their impact. The shared research agenda aims to improve measurement of men's and women's time use, control over assets, and agency by reviewing existing measurement methods, and designing and testing new methods. This partnership brings together the knowledge of the Gender Innovation Lab in measuring gender gaps in economic outcomes, the experience of the LSMS teams in implementing nationally-representative surveys and conducting methodological experiments, the expertise of IFPRI and PIM in collecting sex-disaggregated data on assets and using the WEAI, and the expertise of IRC in developing psychological indicators. This collaboration will ensure cross-country and cross-sectorial comparability, enable the transfer of know-how and learning across institutions, and expand the network available to disseminate the findings from the methodological experiments.

In partnership with a variety of **NGOs, private companies, and multilateral organizations**, PIM will field test different methods of collecting sex-disaggregated data. Findings of the collaborations with FAO, the World Bank, and IRC will be used to improve measurement of the effect of agricultural interventions on women's empowerment and on other development outcomes. In addition to FAO and the World Bank, partners include Kakira Sugar Limited and Oxfam Novib in Uganda, Ariku Farm, Vodafone, Esoka, and GSMA in Ghana, Professionals for Fair Development (GRET) in Senegal, AfricaRice in Benin and Nigeria, IMPAQ International, and several universities. Flagship 6's work on these ongoing projects will help improve their implementation, and contribute to a growing body of rigorously tested interventions on empowerment.

Potential partners that are engaged in gender transformative approaches in rural areas in many countries include **CARE International, Concern Worldwide, Heifer International, Oxfam, and World Vision International**, among others. CGIAR Programs and Centers are engaged with these partners in various ways, and the creation of the Gender Platform will help broaden the engagement to include gender research, with particular focus on CGIAR countries of collaboration.

**AWARD** has a membership of more than 1,000 African scientists, and works with CGIAR programs and development partners. AWARD is thus well-positioned to catalyze partnerships between CRPs and national and regional partners in Africa to drive gender transformative agriculture. AWARD will participate in discussions of research priorities within the Gender Platform, and assist with capacity building. In addition, the Gender-Responsive Researchers Equipped for Agricultural Transformation (GREAT) training program – a certificate program by Cornell University and Makerere University to train a cadre of gender-aware biophysical and social scientists – is well-placed to provide additional training in agricultural gender research and analysis, and will also collaborate with the Gender Platform.

### **2.6.1.8 Climate change**

Climate change and gender are related in several ways. Men and women may have systematically **different perceptions of climate change** due to differences in their knowledge and roles, and **different abilities to adapt to climate change**, which may partly stem from gender gaps in control over assets important for coping with extreme weather events. Although many organizations assert that climate change affects women more adversely than men, PIM research during Phase 1 revealed little evidence for this claim. The PIM-funded research project on "[Enhancing Women's Assets to Manage Risk under Climate Change: Potential for Group-Based Approaches](#)" looked at linkages between gender, climate change, assets, and collective action, and found that climate change does differentially impact men and women, although not necessarily in predictable ways, and that group approaches may be particularly useful for women to build resilience to climate change (Ringler et al. 2014).

As a **factor in decision making over investment and production**, climate change will continue to be integrated into PIM's gender research, with a focus on diagnostic research and design of intervention strategies that work for women. In Phase 1, PIM collaborated with CCAFS on the design and implementation of a new methodology to analyze intrahousehold gender dynamics with relevance to adoption of climate-smart agricultural practices in Bangladesh, Kenya, Senegal, and Uganda. Factors influencing uptake of climate-smart agricultural practices by women and men were analyzed, generating a rich gender-disaggregated open-access dataset that opens additional opportunities to engage students and partners in further study. Among the interventions that researchers will be evaluating during Phase 2, two are important for climate change adaptation (one on irrigation and one on weather-based insurance, see Section 2.6.1.6).

### 2.6.1.9 Gender

All of the outcomes of Flagship 6 are expected to benefit women and reduce gender disparities. Emphasis will be placed on understanding who is excluded from participating and sharing in the benefits of agricultural development, as well as the reasons for and implications of exclusion. In some cases, gender may not be the determining factor of exclusion. Therefore, in addition to its focus on gender, Flagship 6 will examine ways in which gender intersects with other factors of social differentiation, such as age, socioeconomic status, marital status, and ethnicity to shape outcomes.

**The emphasis on youth will improve the quality of gender research.** Disaggregation by age will provide a clearer and more actionable understanding of the importance of gender. For example, part of the unexplained residual in difference in productivity between men and women may derive from lack of control for age when many female farm operators are elderly. Youth issues, and the ways in which age and gender interact, will be examined in all methodological innovations considered. Better data at the individual level will facilitate analysis of the involvement of young men and women in agriculture and in other sectors, and provide a more holistic understanding of how migration and wage employment opportunities affect agricultural production and gender equality. **The focus on youth in this flagship will give special attention to young women.**

### 2.6.1.10 Capacity development

A central component of this flagship is building the capacity of partners both within and outside CGIAR to conduct rigorous gender research and translate research findings into program and policy recommendations that will promote gender equality. A key CapDev element of the flagship is the **design and delivery of learning materials (CapDev element 2)**, which is described in the previous sections. In addition to targeted materials, in Phase 1 PIM supported the creation of the open-access [Journal of Gender, Agriculture and Food Security](#), which includes articles useful for demonstrating how methods can be applied to address key gender research questions. Attention to the **gender-sensitive nature of materials and approaches (CapDev element 5)** is obviously key for this flagship.

**The Gender Platform will assess the capacity building needs** – both of scientists and project managers in CGIAR and NARS, and of partner organizations involved in implementation – to undertake the prioritized research. Based on this assessment, the Platform will identify available options for capacity development at both organizational and individual levels, from short online modules to formal training courses, and including mentoring programs. The Platform will generally not develop and deliver these programs, but will establish a clearinghouse of information about capacity building options.

In addition, the Platform will assist research teams to identify the relevant questions for analysis, and foster **relationships between individual researchers doing similar research for exchange of expertise**. One promising avenue for such networking is to link CRP researchers to strong gender researchers in universities.

**AWARD will play a coordinating role in building the capacity of local partners**, particularly African partners, to incorporate gender-transformative approaches in their work, and ensure that the methods and knowledge generated by the Gender Platform and CRPs are disseminated to partners.

### ***2.6.1.11 Intellectual asset and open access management***

In accordance with the CGIAR guidelines on intellectual asset and open access management, and with the policies of the lead Center and its partners, Flagship 6 will ensure access to its intellectual assets in a manner that encourages access, use, replication, and adaptation of its research while safeguarding the privacy of participants and protecting confidential and proprietary information. The [WEAI Resource Center](#) provides access to a wide range of information, including information on how to develop a WEAI, analyses using the WEAI data, and the publicly available WEAI datasets, all of which use anonymized data to ensure the privacy of the individuals surveyed. PIM is collaborating with the CGIAR Gender Network to develop a searchable database of sex-disaggregated surveys on topics related to agriculture and food security. PIM's [EnGendering Data](#) blog will continue to raise awareness of existing data available for gender analysis, and to educate readers about the challenges in responsibly collecting and analyzing such data.

### ***2.6.1.12 FP management***

The Flagship 6 management team includes **a flagship leader, a leader for Cluster 6.1, and the Coordinator of the Gender Platform**. Both the flagship leader and the Gender Platform Coordinator will serve on the PIM Management Committee.

**The role of flagship leaders will be expanded in Phase 2 relative to Phase 1**, especially with regards to coordinating inputs from participants, reporting on flagship-level progress and budget execution, and tracking outcomes and impact. The flagship management team will be funded for one third of FTE for oversight of the flagship, with pro-rating to take into account the separate funding of the position of Coordinator of the Gender Platform, who will serve concurrently as leader of cluster 6.2. PIM will also cover the cost of a flagship management support function (to help with formulation of annual work plans, tracking of deliverables, and reporting) up to 50% FTE by flagship.

The Coordinator of the Platform will be a full-time senior position, selected through a competitive process, and supported by an administrative assistant (who will work concurrently as program manager for the flagship). The Coordinator will be advised by a Steering Committee composed of gender specialists from CGIAR and non-CGIAR organizations. This group will review annual progress, identify key issues for the year ahead, recommend areas for cross-cutting research, and report to the PIM Director on the performance of the Coordinator.

The Phase 2 proposal development process has been led by the Gender Lead (CV attached in Annex 3.8). Flagship leaders for Phase 2 were selected in July, 2016 through a transparent merit-based process. The PIM Management Committee approved TORs for the positions and selection criteria including experience and excellence in the field (as measured through records of ISI publications and evidence of contribution to policy and other PIM outcomes), demonstrated ability to raise funds and attract strong research and implementation partners, and managerial experience. Staff from all Participating Centers and selected external partners were invited to nominate candidates. Self-nominations were allowed. A selection panel consisting of two SPAP members, one external partner, one representative of the Lead Center, and one representative of the PMU assigned scores to the nominees. As a result of this process, Flagship 6 will be led by **Cheryl Doss of Yale University**, who will be moving to Oxford University prior to the launch of Phase 2 (CV in Annex 3.8). A leader for Cluster 6.1 will be selected through a participatory process led by the appointed flagship leader by September, 2016. The Coordinator of the CGIAR Collaborative Platform for Gender Research (Cluster 6.2) will be selected through a participatory process led by the PIM Director.

## 2.6.2 Flagship Budget Narrative

### 2.6.2.1 General information

CRP Name	Policies, Institutions, and Markets
CRP Lead Center	International Food Policy Research Institute
Flagship Name	Flagship 6: Cross-cutting Gender Research and Coordination
Center location of flagship leader	Oxford University

### 2.6.2.2 Summary

Total Flagship budget summary by sources of funding (USD)

Funding Needed	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Total
W1+W2	950,000	950,000	978,500	978,500	1,007,855	1,007,855	5,872,710
W3	728,323	728,323	750,173	750,173	772,678	772,678	4,502,350
Bilateral	1,886,636	1,886,636	1,943,235	1,943,235	2,001,532	2,001,532	11,662,806
Other Sources							0
	3,564,959	3,564,959	3,671,908	3,671,908	3,782,065	3,782,065	22,037,866

Funding Secured	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Total
W1+W2 (Assumed Secured)	950,000	950,000	978,500	978,500	1,007,855	1,007,855	5,872,710
W3	635,509	419,436	209,718	95,326	0	0	1,359,989
Bilateral	279,104	184,209	92,104	41,866	0	0	597,283
Other Sources							0
	1,864,613	1,553,645	1,280,322	1,115,692	1,007,855	1,007,855	7,829,982

Funding Gap	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Total
W1+W2 (Required from SO)	0	0	0	0	0	0	0
W3 (Required from FC Members)	-92,814	-308,887	-540,455	-654,847	-772,678	-772,678	-3,142,360
Bilateral (Fundraising)	-1,607,532	-1,702,427	-1,851,131	-1,901,369	-2,001,532	-2,001,532	-11,065,523
Other Sources (Fundraising)	0	0	0	0	0	0	0
	-1,700,346	-2,011,315	-2,391,586	-2,556,216	-2,774,210	-2,774,210	-14,207,884

## Total Flagship budget by Natural Classifications (USD)

	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Total
Personnel	1,273,190	1,273,190	1,311,386	1,311,386	1,350,725	1,350,725	7,870,606
Travel	236,354	236,354	243,444	243,444	250,748	250,748	1,461,093
Capital Equipment	0	0	0	0	0	0	0
Other Supplies and Services	837,634	837,634	862,763	862,763	888,648	888,648	5,178,094
CGIAR collaborations	0	0	0	0	0	0	0
Non CGIAR Collaborations	821,206	821,206	845,842	845,842	871,217	871,217	5,076,534
Indirect Cost	396,573	396,573	408,470	408,470	420,724	420,724	2,451,539
	3,564,957	3,564,957	3,671,905	3,671,905	3,782,062	3,782,062	22,037,866

## Total Flagship budget by participating partners (signed PPAs) (USD)

	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Total
IFPRI	2,724,958	2,724,959	2,806,707	2,806,708	2,890,909	2,890,909	16,845,154
CIAT	420,000	420,000	432,600	432,599	445,578	445,577	2,596,356
ICRAF	420,000	419,999	432,600	432,600	445,578	445,577	2,596,356
	3,564,958	3,564,958	3,671,907	3,671,907	3,782,063	3,782,063	22,037,866

Explanations of these costs in relation to the planned 2022 outcomes

Flagship 6 examines gender roles in agriculture and tests interventions to improve gender equity and agricultural performance. It also hosts the CGIAR Collaborative Platform for Gender Research.

Risks to spending mentioned in the program-level budget narrative apply to Flagship 6.

**2.6.2.3 Additional explanations for certain accounting categories**

**Benefits:** Benefit costs primarily include leave, health, and pension costs. The costs are pooled and allocated over a base consisting of total labor. The benefit pool divided by total labor creates the rate applied to labor. For most partners, the benefit rate used in this budget was the benefit rate for the Lead Center, i.e. 58.5%.

**Other supplies and services:** The “Supplies and services” category represents about 28% of the direct costs. This category includes field surveys; research support; cost-shared services for IT and other; workshops and training, including capacity development, meetings and conferences; editing and publications; miscellaneous charges such as copying and fax; a few partners also include benefits in this category.

**2.6.2.4 Other sources of funding for this project**

The large bilateral/W3 donors for Flagship 6 are **IFAD and USAID**. In Phase 2, additional funding will be sought to support the new Gender Platform and maintain PIM’s gender research effort.

### 2.6.2.5 Budgeted costs for certain key activities

	Estimate annual average cost (USD)	Please describe main key activities for the applicable categories below, as described in the guidance for full proposal
Gender	3,564,959	See below and flagship narrative
Youth (only for those who have relevant set of activities in this area)	1,782,480	See below and flagship narrative
Capacity development	1,782,480	See below and flagship narrative
Impact assessment	106,949	See below and flagship narrative
Intellectual asset management	0	See below and flagship narrative
Open access and data management	0	See below and flagship narrative
Communication	149,774	See below and flagship narrative

**Gender:** The gender component of Flagship 6 is **100%** of the Flagship 6 budget, which corresponds to a gender budget in 2017 of **\$3.6M**.

**Youth:** For this flagship the level of intensity in addressing youth issues is estimated at **50%**, that is **\$1.8M in 2017**. The contribution of Flagship 6 to PIM's youth strategy is described in Annex 3.5.

**Capacity development:** The capacity development component of Flagship 6 is derived by adding up the flagship contributions to the capacity development Sub-IDOs, i.e. Sub-IDOs CC2.1.1., CC2.1.2, CC2.1.3, CC3.1.3, CC4.1.1, and CC4.1.2 (see Table C of the Performance Indicators Matrix). It is assumed that the flagship's contributions towards other Sub-IDOs do not count as capacity development. Using this methodology, the Flagship 6 **capacity development budget for 2017** is estimated at **\$1.8M**, which represents **50%** of the total Flagship 6 budget.

**Impact assessment:** The impact assessment budget is estimated to be 3% of the flagship budget, for a total of **\$107K in 2017**. An example of activity counted in this budget is the M&E component of the Gender Platform.

**Open access and data management:** PIM is fully committed to complying with the CGIAR Open Access and Data Management (OADM) Policy and its Implementation Guidelines. Major infrastructures and staff required to do so are covered through overhead costs charged by the Centers, and include: maintenance of digital content collections; Online Public Access Catalog (OPAC)/library catalog systems; website development related to repositories; promotion and training in support of OA/OD. Additional costs specific to PIM research activities (essentially OA fees for journal articles) are budgeted for at project level under Supplies and Services.

**Intellectual asset management:** As explained in Annex 3.10 of the proposal narrative, the budget for IA management is the same as the budget for OA management (see above).

**Communications:** As described in PIM's Communications Strategy, flagship leaders will appoint a staff member responsible for liaising with the Program Management Unit, participating in the PIM communicators group, and supporting the flagship's communications activities, which include: contributions to the PIM newsletter and blogs; organizing knowledge sharing and capacity building events on the topics of the flagship research; representing PIM at local/regional events; and supporting

application of the PIM Branding and Acknowledgement Guidelines at flagship level. It is estimated that these tasks will represent 0.3 FTE of a Communications Specialist, or about \$25K annually per flagship. In addition, Supplies and services include communications-related items, among which publications and workshops; these items are estimated to represent 3.5% of the flagship budget i.e \$125K in 2017. The total is **\$150K (4.2% of the total Flagship 6 budget)**.

### 2.6.2.6 Other

Please disregard the FTE allocations columns in the budget template (the computation of this item is not appropriate for an aggregated presentation of the personnel costs). The approximate number of FTE (average across years) for this flagship is 6. See Annex 3.8 for the CVs of the core members of the flagship team.

The total time dedicated to the **flagship coordination activities** is estimated at about 30% FTE. Following the guidance in the case when this percentage is below 50%, the corresponding costs are included in the flagship budget. PIM will also cover the cost of a flagship management support function up to 50% FTE by flagship; the corresponding costs are included in the program management costs. In the case of Flagship 6, the management support function will be coordinated with administrative support for the Gender Platform.

There are no plans to purchase capital equipment.

### 2.6.3 Flagship Uplift Budget

Outcome Description	Amount Needed	W1 + W2 (%)	W3 (%)	Bilateral (%)	Other (%)
National researchers use improved gender research methods in 2 additional CGIAR countries of collaboration (includes capacity development)	800,000	100	0	0	0
Gender dimensions of policies are strengthened in 1 additional CGIAR country of collaboration (includes capacity development)	1,200,000	100	0	0	0
Indicators of women's empowerment in agriculture increase in 1 additional CGIAR country of collaboration (includes capacity development)	100,000	100	0	0	0