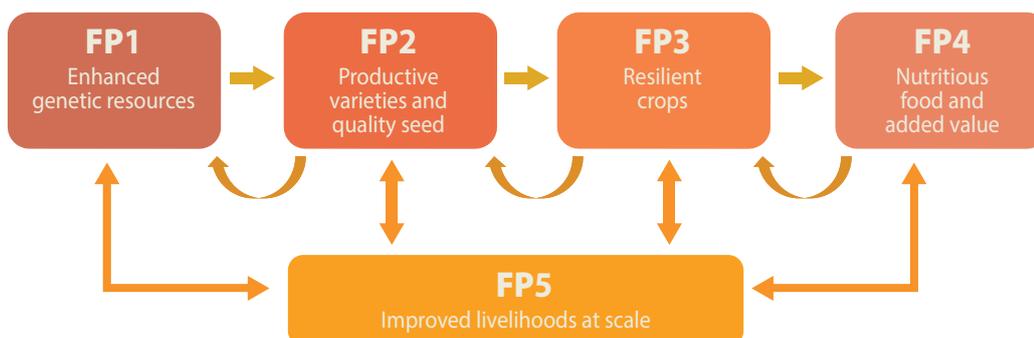




## Agri-food systems research in the CGIAR Research Program on Roots, Tubers and Bananas

The CGIAR Research Program on Roots, Tubers and Bananas (RTB) brings together Bioversity International, the International Center for Tropical Agriculture (CIAT), the International Potato Center (CIP) and the International Institute of Tropical Agriculture (IITA) and CIRAD with more than 350 partners for research and development on banana, cassava, potato, sweetpotato, yam, and minor roots and tubers.

### RTB Flagship Projects (FPs)



**FP1** and **FP2** support gender-responsive breeding pipelines to obtain high-yielding and nutrient-rich varieties in line with consumer demand. FP2 includes a crosscutting component to improve smallholder access to healthy RTB planting material and new varieties. Scaling occurs with national seed agencies, private companies, service providers, and development partners.

**FP3** develops an array of products for pest and disease characterization and management and improved agronomic practices for more resilient cropping systems. Optimized land, crop, and water management techniques are developed

in collaboration with national agriculture research systems and universities and promoted through well-trained extension services and other service providers.

**FP4** promotes collaboration among public and private partners to develop and disseminate improved processing and post-harvest technologies and protocols for RTB-based food products that help to reduce waste and make healthy and nutritious food available. FP4 provides tools, technical evidence and policy advice for designing and implementing agriculture for nutrition initiatives and education/communication programs.

**FP5** has a dual role as a space for systems research and for providing capacity development and backstopping in support of innovation and scaling in FP1–FP4. It provides a livelihood systems-related guiding framework for all FPs to steer them toward promising scaling of innovations, opportunities for advancing gender and intergenerational equity and research in areas of greatest expected return.

## Systems research

### Perception

An agri-food system (AFS) includes all processes involved in feeding people: growing, harvesting, processing, packaging, transporting, marketing, consuming, and disposing of food and packaging. It includes the inputs needed and outputs generated at each step. Agri-food systems affect the incomes of those whom they employ, the nutrition and health of consumers, and the quality of the natural resource base. They embody a mosaic of different crops, animals, and fish and support processes at different levels of scales. RTB research requires appropriate involvement of women and men at each of these levels—from household, to community, to landscape and above—and promotes the use of participatory and multistakeholder approaches that aim to strengthen engagement and target livelihoods enhancement.

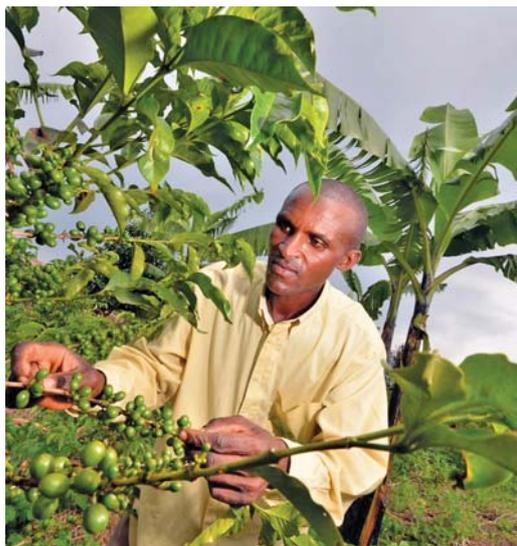
In Phase II of RTB, systems thinking is integrated into commodity research to build a comprehensive AFS-CRP. This matches commodity research with livelihood contexts, and takes a broader systems perspective to accelerate the process of going to scale, guided by FP5. It includes an array of linkages with other crops, livestock, and fish in diverse agri-food systems through partnerships with other AFS-CRPs in the CGIAR portfolio, as well as with global integrating CRPs to account for broader nutrition, health, landscape, political and market factors in a context of climate change.

### Mainstreaming

FP5 has a dedicated cluster (CC5.2) on sustainable intensification which aims to identify system entry points, trade-offs and synergies of RTB innovations to sustainably enhance and improve livelihoods. At the crux of this systems approach sits the trade-offs among (1) agricultural intensification, for maximizing productivity; (2) agricultural diversification, for diet and income diversification and risk management; and (3) natural resources management, for sustained ecosystems services that underpin production. Sustainable

intensification of RTB agri-food systems focuses on the particular implications for RTB crops within the broad panorama of agricultural transformation and rural transitions. For different contexts, there is an array of linked options and needs for sustainable intensification, with a set of sequenced changes in RTB AFS at the household, community, landscape and value chain level.

Many RTB innovations provide strong climate resilience functions; e.g. bananas providing shade and diversified income when intercropped with coffee. Options for stepwise intensification of market-oriented RTB systems will be identified and evaluated to improve agronomic efficiency and income at the farm scale and ecological sustainability at landscape scale: e.g., the intensification of potato systems in the east African highlands requires first investments in (1) healthy seed systems, and only then investments in (2) fertilizers and (3) pest control. This sequencing improves agronomic, economic and ecological efficiency and needs to be accompanied by the right investments (private and public) through partner engagement guided by cluster on scaling innovations (CC5.4).



Coffee and banana intercropping in Rwanda. Photo N.Palmer/CIAT

### Collaboration

Where RTB crops predominate in the agri-food system, RTB takes a lead role, involving other AFS-CRPs when these contribute to improving livelihoods. In those geographies where RTB crops play a secondary (or 'companion') role in the agri-food system, RTB collaborates with the relevant AFS-CRP. The 'AFS innovation and scaling fund' creates an incentive structure for systems integration with a livelihood focus among RTB FPs and with other AFS and GI CRPs, within the framework of site integration.



A broad alliance of research-for-development stakeholders & partners