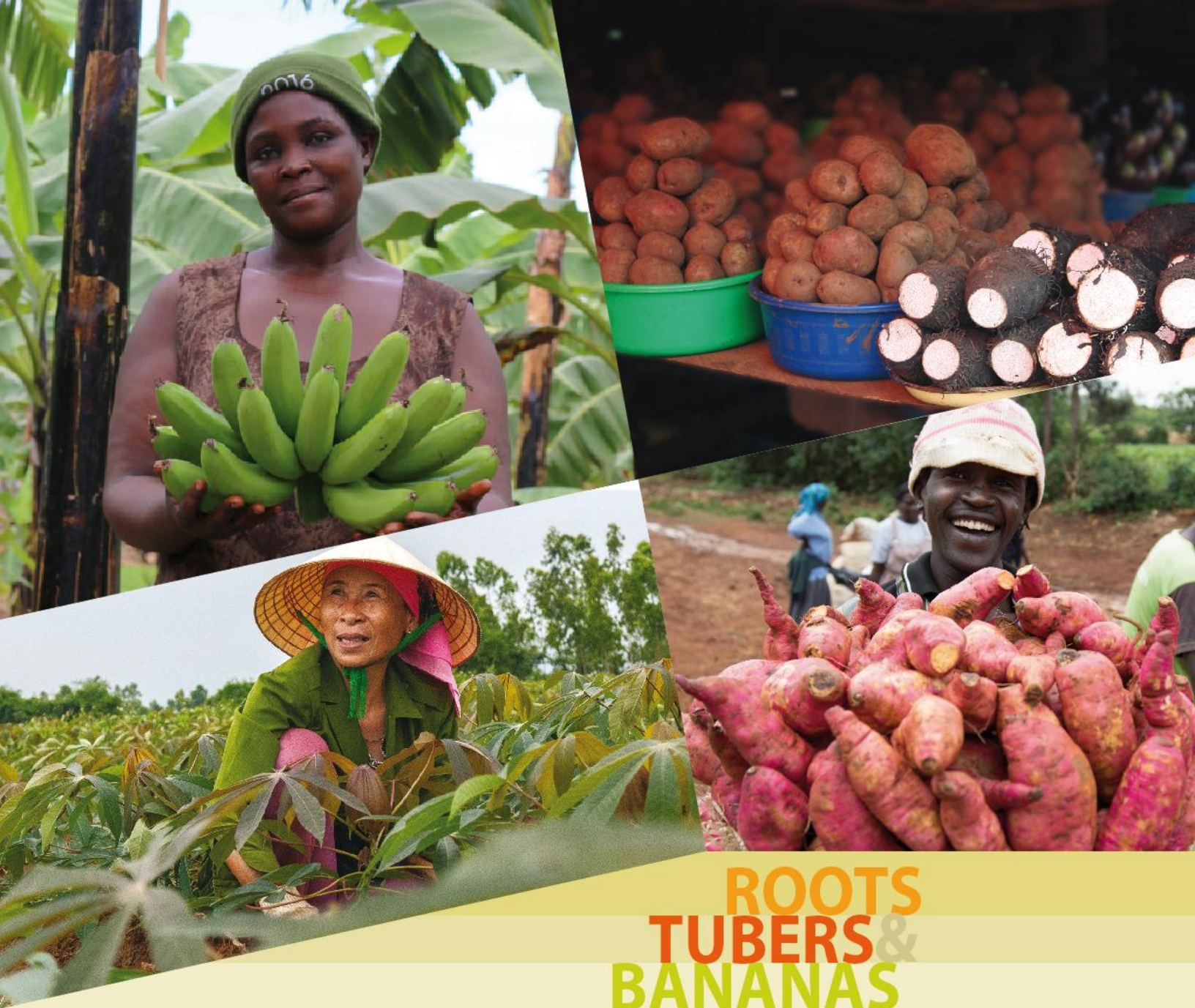




ROOTS TUBERS & BANANAS

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RESEARCH
PROGRAM ON
Roots, Tubers
and Bananas

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ANNEX 1: RTB Partnership Strategy

1. Introduction

RTB is developing a partnership strategy to guide program participants in selecting, managing, evaluating and enhancing partnerships. The program considers three main objectives in shaping its partnership arrangements: (1) positioning itself in a fast changing landscape of scientific innovation and centers of expertise, especially with respect to genetics and discovery research; (2) building on the promising efforts during RTB phase I to establish more inclusive relationships with an array of research partners including farmers organizations and other end-users for inclusive, collaborative research; and (3) engaging a wider group of development partners and private sector entities as agents of change for scaling. RTB's approach to building partnerships is eclectic and cross-sectoral. Where technologies can be provided through markets then these objectives may be achieved primarily through private sector partners and there is encouraging progress in this regard. For the case of public goods, which are not ordinarily provided by a market mechanism, then other types of development partners come to the fore. These include international NGOs and government agencies, including large-scale public sector development projects supported by international finance agencies, and these require the use of diverse promotional approaches such extension programs, but also novel mechanisms such as plant clinics, innovation fairs and seed exchanges.

'Partnership' is central to international agricultural research for development precisely because collaboration mobilizes research results through bringing together diverse actors to produce development results. Frequently this involves multi-stakeholder partnerships (MSPs) which include, for example, networks, alliances and consortia. It also frequently involves clients, beneficiaries and users of technology including farm households, community groups or market agents, in research or activities designed to foster innovation. Because of the pervasive nature of partnerships they are a key part of most RTB activities and form an intrinsic part of the nested set of theories of change (ToC) which make outcomes possible, with the scale and scope of partnerships changing at each level.

RTB defines partnership as "a sustained, multi-organizational relationship with mutually agreed objectives and an exchange or sharing of resources or knowledge for the purpose of generating research outputs (new knowledge or technology) or fostering innovation (use of new ideas or technology) for practical ends (Horton et al 2009)".

RTB recognizes that strong partnerships are intrinsic to achieving both research products and development outcomes. To achieve strong and enduring partnerships it is necessary to address both the structural aspects of collaboration (partnerships) as well as the interactive, process dimension (partnering). RTB program participants enter into many diverse partnering arrangements with varying levels of formality and for multiple purposes. In most cases the partnerships are entered into by program participants under a general RTB umbrella (and recorded in an inventory) following principles of subsidiarity where the program participants directly manage the partnership relationships. A sub-set of these partnering arrangements involve RTB more directly as a higher level actor. Partnerships in RTB are both formal, often mediated by a contractual agreement such as the Program Partnership Agreement, but also informal where no written contract exists. The inventory of partnerships, which includes both types and specification of roles and expectations, is useful for partnership monitoring and evaluation purposes and analysis potentially linked with scaling supported by Flagship Project 5.

2. Roles and partnership modes

Partners play diverse roles along the impact pathway framed by the three general objectives mentioned previously:

1. Positioning for discovery research. Partnerships with advanced research institutes play a critical role for centers to access cutting edge research capacity, technology and tools.
2. Ground-truthing technologies through collaborative, inclusive research. National research institutes are often next users of RTB developed technology and tools and stronger institutes often are involved in co-developing and co-disseminating technology. Capacity development plays a critical role in strengthening these partners and expanding their capability to use more advanced tools and methods as well as to strengthen their inclusive and collaborative approach to technology testing.
3. Engaging partners for scaling. RTB centers engage and influence a broad array of development partners including NGOs, extension offices and national agricultural development programs which adapt, disseminate and promote technology, to achieve impact at scale. Another route to achieving impact at scale is by engaging market actors through public private partnerships who provide varieties, seed and other inputs along value chains; here profit and the entry of new business drives scaling. RTB has extensive experience with the Participatory Market Chain Approach which guides partner selection for inclusive value chain development with private sector partners playing a key driving role (Devaux et al 2011). This approach has been further elaborated more recently to strengthen the entrepreneurial capacities of producers (DA-CHARM2 and CIP-FoodSTARTm 2014a and 2014b). Still other types of partners may be involved in the policy area including advocacy agents to create a more enabling environment for scaling to occur.

The particular set of partners having the differing roles described above changes over time, creating a dynamic of partner selection, consolidation and growth, as well as sometimes transition and exit. A wide diversity of such partners and roles is described in the flagship project descriptions. Increasingly, however, partners come together in MSPs. A selection of these is presented for RTB in table 1 following the ISPC (in development) typology of distinct Innovation and Partnership Modes:

Mode 1: Agricultural research partnerships. Includes research consortia. Priorities are framed by public policy imperatives or by private industry sponsored funding.

Mode 2: Agricultural innovation delivery partnerships. Includes partnerships, platforms and alliances with the private sector, NGOs and farmer groups create value for farm households and companies. Priorities are framed by the convergence of three factors: technology push from research, demand pull from farmers and markets, and by public policy imperatives.

Mode 3: National Agri-food systems innovation partnerships. Relates to inter-linked farm-to-policy multi-stakeholder processes and partnerships to action changes in food systems that create social and economic value. Priorities framed by negotiation between public and private sectors and articulated in national development plans and policies.

Mode 4: Global development innovation partnerships. These are global architectures of MSP platforms which create coherence between global and local agendas and implementation strategies and action that brings about systems adaptation. Priorities framed by global negotiation and agreement in the SDG's aligned with national development plans and policies.

AFS-CRPs such as RTB which bring together the centers with a wide array of other partners to create change in food systems belong to mode 3. GI-CRPs which create coherence between global and local agendas belong to mode 4. Hence with the development of the CGIAR portfolio relationships with particular partners may be mediated through their linkages to CRPs.

3. Building and sustaining partnerships

RTB partnership strategy recognizes that successful established partnerships will require the following (Horton et al 2009a):

- A common vision and purpose (whilst recognizing the existence of distinct goals and purposes of participating organizations).
- Realistically defined goals.
- Legitimacy and support for the partnership by parent organizations.
- Equitable sharing of resources, responsibilities, and benefits.
- Transparent governance and decision-making.
- The creation and re-creation of trust.
- Learning and capacity development.

Hence the RTB partnership strategy recognizes a series of steps:

1. Partnership scan: a scan of existing MSPs and other types of partners to identify commonalities and gain synergies. This exercise would also characterize the partner context landscape to identify partners with a common vision, potentially shared goals and complementary competencies and scope.
2. Articulation of the partnership mechanism: Establish the type of agreement required by partners. This may include contract /grant based or complementary agreements with shared resources, risks and responsibilities. An inventory of these agreements is established and used in M&E.
3. Partner-based implementation: monitoring the process in terms of agreed principles of transparency, communication, equity and trust.
4. Partner reflection: internal to the specific activity but also external costs and especially benefits in terms of strengthened capacity and increased influence.
5. Partnership transition: “Moving forward” or “moving on” expand the scale and scope of the partnership or looking to transition and exit plan for the partnership.

4. Research on partnerships and M&E

RTB has actively supported partnership research to generate evidence about what works in partnership practice. This includes the use of social network analysis to monitor partnerships among program participants and with other organizations (ILAC 2009). Partners in the four regional banana networks (www.banana-networks.org) facilitated by Bioversity since the 1980s with active participation from IITA, CIRAD and CIAT were surveyed using a framework based on the vibrancy, connectivity and effects of networking in 2013. Results showed that the networks had been effective in raising the awareness of the banana development potential, generating new linkages across country boundaries and building and providing access to new knowledge and tools for the study of banana genetic diversity and pest and pathogen management. Areas for strengthening included the projection of networking content beyond the network representative in each country, diversification of stakeholder types linked by networks and the expansion of electronic networking. Monitoring the composition and evolution of the research networks of the CGIAR Research Program on Roots, Tubers and Bananas (RTB) will continue and be documented as case studies.

Specialized tools will be developed to support partnership M&E. For example, RTB researchers have developed the “Partnership Health Check List” to encourage early and open communication on the partnership processes within the project, so that any concerns can be identified and addressed appropriately. This covers the main factors which contribute to successful partnerships: a common vision, understanding the roles of each partner, information flows, communication practices, and conflict resolution practices (Horton et al 2009).¹ The tool uses a simple Likert Scale for respondents to score their satisfaction with different processes within the partnership. Respondents are encouraged to include written comments as well. So far the tool has been used mainly with the delivery system components where there are multiple partners from different organizational and disciplinary cultures. Repeating the exercise after two years allows an assessment of trends and identification of improvement (or lack thereof) in specified areas. Questions can be adapted to reflect the different stages in the partnership cycle (e.g. scoping/initiation; implementation/consolidation; transition/exit).

5. Partnering capacity and resourcing

The RTB partnership strategy will align with the implementation of RTB CapDev interventions which is premised on the following (1) to pursue and foster partnerships with complementary capacities that respond to CapDev needs expressed by stakeholders. This has already been a strength of the program’s first phase. RTB will also (2) fully tap into the resources provided by the CGIAR CapDev community of practice, like the CapDev framework and the suggested indicators for M&E of each element. Finally, CapDev professionals will (3) work very closely with issues related to data, information, knowledge and communication to allow a maximum level of availability, accessibility and applicability of CapDev products, processes, and lessons learned which will be shared with wider RTB partnerships.

Table. RTB partnership modes (ISPC, 2015)²

Mode 1. Agricultural research partnerships (Research Consortia)	
Name	Potato learning alliance for policy action (supported by PASIC)
Convener	MAAIF (Ministry of Agriculture in Uganda)
Specific focus and objective	Joint mapping of the constraints and opportunities for intensification of potato production systems in Uganda by the sector stakeholders for improved investment planning and policy action
Science agenda	Understand the interdependency of constraints, opportunities and actors in the potato sector and the use of novel multi-stakeholder approaches to guide sector investments
Geographic focus/location	Uganda - national level and specific detailed studies in SW Uganda
Role of the CRP FP:	RTB is providing key technical knowledge on seed systems, pest- and disease threats, intensification options, drivers of technology adoption and investment/policy planning Flagship 2, 3, 4, and 5 are all involved to map and prioritize innovations at plant, plot, household, value-chain and policy level.
Key CGIAR partners and their roles	IITA - coordinating the multi-level analysis and with MAAIF coordinate the facilitation of the learning alliance for joint investment planning and policy action

¹ Horton, D.; Prain, G.; Thiele, G. (2009). Perspectives on Partnership: A Literature Review. Working Paper 2009-3. International Potato Center (CIP). Lima, Peru.

² ISPC, 2015. *Strategic study of good practice in AR4D partnership*. Rome, Italy. CGIAR Independent Science and Partnership Council (ISPC), viii + 39pp + annex 49pp.

Mode 1. Agricultural research partnerships (Research Consortia)	
Name	Potato learning alliance for policy action (supported by PASIC)
	CIP - providing technical expertise at yield gap analysis and guiding innovations in the area of seed systems, varieties, and cropping systems. IFPRI - providing technical backstopping on drivers of technology adoption through HH surveys and through action research on farmer decision making.
Key 'external' partners and their roles	MAAIF - the policy leader. NARO - backstopping the field research, EPRC - Value chain study and policy advice, IFDC-CATALIST - Promoting agri-business clusters, Local Government - guide local policy planning and implementation, Private sector - engaged in setting priorities, co-develop zonal investment plans, implementing of and lobby for sector investment.
Contribution to impact pathway and theory of change	This multi-scale and multi-actor learning alliance builds joint understanding in the sector on key interdependent constraints and actors in the potato sector in Uganda and prioritizes investment planning and policy action to boost the sector's productivity and revenue generation.

Mode 2. Agricultural innovation delivery partnerships (Partnerships, platforms and alliances with the private sector, NGO and farmers groups creating value for farmers and companies)	
Name	BBTD Learning Alliance for Sub-Saharan Africa www.bbtvalliance.org
Convener	RTB
Specific focus and objective	To develop prototypes for community initiatives to recover banana production in areas affected by BBTD bringing together international scientists, national research programs, farmer and community organizations, local field agencies and laboratories producing clean planting material
Science agenda	Develop appropriate management packages to recover banana production and delay the spread BBTD; Understand the BBTD epidemiology and ecology for a better knowledge on factors driving the disease spread; Develop tools and procedures for BBTD monitoring, production of clean planting material, understanding gender roles and models for integration for sustainable intensification of production;
Geographic focus/location	Eight pilot sites in 7 countries of Sub-Saharan Africa representing the four different banana production systems in the region – perennial banana gardens for food security in East and Central Great Lakes Africa, mixed variety banana/plantain in forest fallow zones of Congo Basin, plantain in bush fallow and backyard plots, smallholder dessert banana production
Role of the CRP FP:	Seed financing to plan alliance and set up pilot sites, framework for ongoing partnership for scaling out and addressing surveillance and exclusion into countries without BBTD
Key CGIAR partners and their roles	IITA & Bioversity: implementation of RTB planning grant for development and implementation of Alliance strategy; IITA, Bioversity and CIRAD: implementation of RTB research grant focused on learning alliance to recover banana production in BBTD affected areas in Sub Saharan Africa
Key 'external' partners and their roles	Universities, NARS and NPPOs in Burundi, Malawi, DRC, Congo, Cameroon, Gabon, Nigeria, Benin to carry out participatory prototyping of banana recovery and applied field research on BBTD epidemiology and socioeconomics and gender roles in banana cropping, Univ. of Queensland with additional funds to expand work in Benin and Nigeria, Vitropik tissue culture lab providing expertise in in vitro multiplication techniques for plantains and banana.

Mode 2. Agricultural innovation delivery partnerships (Partnerships, platforms and alliances with the private sector, NGO and farmers groups creating value for farmers and companies)	
Name	BSTD Learning Alliance for Sub-Saharan Africa www.bbtvalliance.org
Contribution to impact pathway and theory of change	Developing tools and technologies to enhance the returns on banana production by utilizing BBTV-free planting materials by complementary innovation for appropriate cropping system practices and market linkages with a strong gender perspective; building national and local capacity to implement effective BSTD initiatives. The initial pilot sites provide key methods and approaches to expand banana recovery to more communities beyond the initial pilot sites. The initial sites also provide recovered banana production sites for clean seed sites and community to community linkages for local expansion of the banana recovery approach.

Mode 2. Agricultural innovation delivery partnerships (Partnerships, platforms and alliances with the private sector, NGO and farmers groups creating value for farmers and companies)	
Name	Sweetpotato for Profit and Health Initiative (SPHI)
Convener	International Potato Center, Sweetpotato Action for Security and Health in Africa (SASHA) Project Manager led 2009-2014; as of 2015 SASHA Project Manager co-leads with Executive Director of the Forum for Agricultural Research for Africa
Specific focus and objective	By 2020, the SPHI seeks to invest in breeding, seed systems and sweetpotato stakeholders' capacities in 17 Sub-Saharan Africa (SSA) countries so that, in 10 years, 10 million families enhance crop income 15% and diet quality 20% by increasing output and intake, diversifying use, and building gender-equitable market chains.
Science agenda	Advances in addressing the bottlenecks hindering sweetpotato reaching its full potential are presented and discussed at annual Community of Practice Meetings in the following areas: Breed and Genomics; Seed Systems and Crop Management, Marketing, Processing and Utilization; Monitoring, Learning and Evaluation. In addition, 2 of the CoP groups sponsor on-line discussions on specific topics.
Geographic focus/location	17 target countries in sub-Saharan Africa (Kenya, Uganda, Tanzania, DR Congo, Burundi, Rwanda, Ethiopia, Malawi, Mozambique, Madagascar, Zambia, South Africa, Nigeria, Ghana, Burkina Faso, Benin)
Role of the CRP FP:	Roots, Tubers and Bananas (RTB) is a member of the SPHI Steering Committee Dagmar Wittine, representing RTB
Key CGIAR partners and their roles	International Potato Center; HarvestPlus, RTB all members of the SPHI Steering Committee
Key 'external' partners and their roles	SPHI Steering Committee Organizations: FARA, PATH (Intl Health NGO), Farm Concern (regional NGO headquartered in Kenya); Helen Keller International, North Carolina State University, Natural Resources Institute Donors: Bill & Melinda Gates Foundation, DFID, USAID, Irish Aid, Alliance for a Green Revolution in Africa Organization members of the SPHI Steering Committee agree to: ▪ Sharing the SPHI vision of reaching at least 10 million African households by 2020, with knowledge, improved varieties and diversified use of sweetpotato, for improved incomes and health. ▪ Being engaged in sweetpotato-related activities & sharing data on the reach and impact of those activities. ▪ Sharing knowledge gained through its activities and interactions on the Sweetpotato Knowledge Portal, a website to which all registered users can contribute to

Mode 2. Agricultural innovation delivery partnerships (Partnerships, platforms and alliances with the private sector, NGO and farmers groups creating value for farmers and companies)	
Name	Sweetpotato for Profit and Health Initiative (SPHI)
	▪ Sharing information about emerging sweetpotato technologies with its networks and so contribute to building the network of actors working on sweetpotato in Africa ▪ Appointing a representative to participate actively in annual meetings of the SPHI, covering the representative's attendance costs ▪ Participating in relevant communities of practice groups and contribute to the growth and development of these communities
Contribution to impact pathway and theory of change	Many partner organizations are interested in taking new varieties of sweetpotato and/or other technologies-to-scale. Having trained, well informed partners in key to success among all steps in the impact pathway. Partners are encouraged to send their own staff members to the relevant community of practice (CoP) meetings and to load information about their organization and its relevant projects to the Sweetpotato Knowledge Portal (www.sweetpotatoknowledge.org).

Mode 3. National Agri-food systems innovation partnerships (Inter-linked farm to policy multi-stakeholder processes and partnerships action changes in food systems that create social and economic value)	
Name	Irish Potato Coalition
Convener	VITA, CIP
Specific focus and objective	The wider target group initially will be the four million potato farming men and women in six countries of East and Southern Africa. Benefiting from this will be tens of millions of urban and rural consumers of potato as a nutritious food.
Science agenda	To deliver on the goals of the Coalition requires these three strands to reinforce each other under a single results framework encapsulating the aims, objectives and specific work packages. • WP1 Creating viable seed potato systems for four million farmers in 6 countries - present level of 0-2.5% of farmers using improved quality seed to increase to 25%. • WP2 Supporting potato production for small highland farmers to boost nutrition and incomes - present yields of 8 tonnes per hectare to double to 16 tonnes for one million farmers. • WP3 Value chain and business development – a 'pro poor' approach to create wealth for potato farmers at affordable prices for consumers - present incomes of US\$100 to reach US\$300.
Geographic focus/location	- Ethiopia, Kenya, Uganda, Tanzania, Malawi and Mozambique
Role of the CRP FP: 2,3, 5	Provide robust, high yielding market demanded varieties; technologies and approaches to ensure access to quality seed. Improved management options; Evidence based scaling strategies
Key CGIAR partners and their roles	CIP, Wageningen University – research on seed production, disease and crop management
Key 'external' partners and their roles	Teagasc, Wageningen University and will partner with African research centers for applied research and capacity building. Alliances of agriculture NGOs including Vita, Self Help /Gorta, Concern Universal and Farm Africa will partner with local agriculture offices in support of farmer groups. The Irish Potato Federation members and international agro-industry supporting both seed and ware potato marketing, identify business opportunities and develop business plans.

Mode 3. National Agri-food systems innovation partnerships (Inter-linked farm to policy multi-stakeholder processes and partnerships action changes in food systems that create social and economic value)	
Name	Irish Potato Coalition
Contribution to impact pathway and theory of change	The innovative lynchpin of the Coalition is—the nexus of a collaborative model of science, business, and development. Expertise in these domains will be applied over a long-term horizon and a focus on the whole potato value chain. Access to knowledge and direct field experience from other member’s means that program design and implementation will be catalysts for transformational change. This collective, evidence-based knowledge will be key to breaking new ground as the Coalition pilots best practice and is aligned to the principles of FP2 impact pathway and theory of change in achieving development outcomes through functional partnership models along the entire value chain.

Mode 4. Global development innovation partnerships (Global architectures of MSP platforms create coherence between global and local agendas and implementation strategies and action that brings about systems adaptation)	
Name	Regional banana networks – MUSALAC, INNOVATE PLANTAIN, BARNESA, BAPNET (www.banana-networks.org)
Convener	Bioversity International
Specific focus and objective	Raise the profile of banana as a commodity meriting research and development resources; Strengthen regional research coordination focused on high priority banana threats; Build research and knowledge innovation initiatives in response to threats and opportunities
Science agenda	Focus on genetic resource conservation, access and use, response to emerging pest and pathogen threats, more resilient market-linked smallholder production models responding to biotic and abiotic stress
Geographic focus/location	Banana growing countries in Asia/Pacific, East and Southern Africa, West and Central Africa and Latin America/Caribbean
Role of the CRP FP:	The framework of RTB FP5 has linked the regional banana networks (along with PROMUSA and MUSANET) into such crucial CRP initiatives as the RTB priority assessment, BananaMapper and task forces on the threats of banana pathogens to smallholder livelihoods.
Key CGIAR partners and their roles	IITA – partner in networks in Africa; CIRAD – partner in network in West and Central Africa and Latin America/Caribbean; CIAT – partner in network in Latin America/Caribbean
Key ‘external’ partners and their roles	Representatives from over 45 banana producing countries usually from national research organization or other prominent research entity with recognized leadership role nationally to contribute information and contacts about the status of banana production and marketing, banana research and problems and opportunities to the regular updating of a regional agenda
Contribution to impact pathway and theory of change	The regional banana networks, evolving both towards the use of more electronic tools and the involvement of a wider diversity of stakeholders, occupy a central role in the multiple dimensions of RTB impact, linking efficiently and effectively the banana community to priority setting and outcome monitoring, to the execution of research projects and to scaling of results

Mode 4. Global development innovation partnerships (Global architectures of MSP platforms create coherence between global and local agendas and implementation strategies and action that brings about systems adaptation)	
Name	Global Cassava Partnership for the 21 st Century - GCP21
Convener	CIAT, IITA and RTB
Specific focus and objective	Importance of building or strengthening all the links in the chain from science to development, including the industrial development. The ultimate goal being to increase the cassava yield worldwide but particularly in Africa. Although the partnership is global, because of the huge importance of cassava in Africa for human consumption, most of the GCP21 activities are focusing onto Africa.
Science agenda	Cover all R&D from the field to the plate, looking for gaps, and weaknesses to be filled by the community including the private sector.
Geographic focus/location	Worldwide with a special emphasis in Africa.
Role of the CRP FP:	All the cassava R&D activities that are part of RTB are participating and contributing in multiple ways to the GCP21 activities, allowing to outreach and collaborate with similar and complementary activities in many more institutions, organizations, and private enterprises throughout the world.
Key CGIAR partners and their roles	IITA – partner in networking in Africa; CIAT – partner in networking in Latin America/Caribbean/Asia; ILRI – partner for animal feed and cassava waste; CIRAD – partner in networking in West and Central Africa for cassava processing, cassava pests and diseases;
Key ‘external’ partners and their roles	ISTRIC, GSTRI, GCRI, CATAS – Co-Organizing the first World Congress on Root and Tuber Crops in Nanning, China; TTDI – Partner in networking in Thailand; NRI - Partner in networking in cassava processing; partnering with all the NARS in cassava producing countries in Africa and South East Asia; ASARECA and CORAF – Partnering in networking for cassava in Africa; FARA and NEPAD partnering for networking in Africa for policy; EU, WB (EAAPP, WAAP) and AfDB partnering for networking in Africa; GAIN, WISHH – partnering for gari processing improvement; FAO, IFAD partnering for networking in Africa; AATF - partnering for networking in Africa and potential host of GCP21-Africa; and many more organizations in the world.
Contribution to impact pathway and theory of change	The central role of GCP21 is three fold: 1- Advocating for the cassava crop to increase awareness of its key role to feed the world, with the aim to increase funding and R&D, 2- Finding gaps in R&D to increase science and technology for its use to increase efficacy of production, processing and use for food, feed and energy, to increase the translation of science into development through increasing the yield of cassava varieties fit for the use of the final products, 3- Increasing access to information about cassava through websites, meetings, workshops, conferences, publications and more. All of these activities are aiming at impacting the human condition and the well-being of billions of people in the developing world by 2050.

ANNEX 2: RTB Capacity Development (CapDev)

Building on achievements of phase I: RTB Phase I included a comprehensive approach to CapDev. Some examples of efficient and successful interventions are related to CapDev in gender research: The RTB evaluation in 2015 noted that the “recent RTB focus on gender capacity strengthening has delivered impressive results over a relatively short period”. On pest and disease management, cross-center CapDev efforts have been focusing on a better understanding among scientists and research partners of seed degeneration, while strengthening capacity of national plant protection organizations to produce and act upon pest risk assessment (PRA). In Africa, learning and training on the banana bunchy top disease (BBTD) has been enabled through experiential learning on pilot sites. CapDev on seed systems in yam and potato focused on knowledge and skills for clean seed production, multiplication, cost-effective propagation techniques and quality certification. A good example in the area of postharvest research relates to developing local capacity among smallholder farmers for postharvest handling and processing of RTB crops in Uganda in order to exploit emerging market opportunities.

Between 2013–2014, RTB strengthened the capacity of over 61,000 scientists, NGO staff and farmers—half of which were female—through short training programs. In the same period, degree training programs (MSc and PhD) were offered to 212 researchers in total, including 101 women.

Priorities Phase II: Table 1 summarizes the CapDev elements of the CGIAR framework that the FPs intend to address through their clusters. The summary was obtained through a review of the descriptions of each cluster, and the half-page narrative on CapDev in each FP. The three priority interventions relate to gender responsive approaches, as well as institutional and organizational strengthening.

Table 1: CapDev interventions per flagship in Phase II

CapDev Element	FP1	FP2	FP3	FP4	FP5
1. Needs assessment and intervention strategy					
2. Learning materials and approaches		X		X	
3. Develop CRPs and Centers’ partnering capacities					X
4. Develop future research leaders	X	X			
5. Gender sensitive approaches throughout CapDev	X	X	X	X	X
6. Institutional Strengthening	X	X	X	X	
7. Monitoring and evaluation (M&E) of CapDev					X
8. Organizational Development	X	X	X	X	
9. Research on capacity development				X	X
10. Capacity to Innovate					X

CapDev in RTB has several challenges still to address:

1. The review of the impact pathway reveals obvious needs to develop CapDev interventions in more than the described elements. For example, while all impact pathways refer implicitly to the development of partnering capacity and the capacity to innovate, those elements are not yet explicitly addressed in the narratives. This represents an interesting challenge for future planning, implementation, and M&E.

2. Likewise, the development of partnering and innovation capacities is an integral part of organizational and institutional capacities. As such, they play a very big role in RTB even if not explicitly mentioned in most narratives. It is worthwhile to include their analysis into the M&E framework of the program.
3. The absence of mention of needs assessments and intervention strategies could mean that they have been largely addressed in the first phase of the program. However, FP5 could play a role to provide support in this area and assure that CapDev interventions are needs-based and that the design is outcome-orientated.
4. While certainly all FPs will work on the development of future research leaders through MSc, PhD and postdoctoral degree training, it is not surprising that FP1 and FP2 emphasize this form of CapDev; the breeders represent a very well defined and precise target group. This type of capacity building also involves mentoring and coaching of next generation scientists.

Role of FP5 in CapDev: Most FP5 CapDev interventions will focus on increasing stakeholders' capacity to innovate in order to achieve impact at scale. FP5, and specifically CC5.4 include a support and research function on CapDev to enhance cross FP learning on scaling. The learning processes will be guided by the following questions that will constitute the research on CapDev agenda:

- What CapDev models and mechanisms have the highest impact on customizing research outputs and bringing them to scale?
- Which opportunities exist for using ICTs for reaching and building capacity among development partners and farmers?
- What other CapDev interventions and knowledge sharing and learning methods, including institutional changes, are needed to co-create or broker RTB outputs and receive feedback for technology refinement? This work will examine the concept and approaches known as 'capacity to innovate'.

FP5 could link to and collaborate with other flagships, especially via CC5.4, as follows:

- FP1 Research with RTB Global networks and partnership initiatives, such as the breeding community of practice.
- FP2 Institutional capacity to apply evidence-based analytical procedures to develop reliable, robust, profitable and sustainable seed system interventions, identify key research questions, and speed-up the dissemination of new varieties.
- FP3 Research with RTB global networks and partnership initiatives, such as the BBTD Alliance.
- Collaboration on advocacy approaches for effective policies and practice that strengthen capacities of partners and clients for using improved data management systems and tools, and defining conducive regulatory frameworks for movement and exchange of planting material.
- Research on the potential of ICT-based learning and extension approaches to deliver locally-appropriate IPM technologies and underlying ecological concepts to a broad range of farmers.
- FP4 Gender and youth: Develop and strengthen the capacity of boys and girls to develop as entrepreneurs for small businesses along the post-harvest value chain through, e.g. the

integration of key messages into school curricula as well as investment in education and trade schools.

Research on partnership models, and suitable value chain approaches for going to scale with food-based nutrition programs and value chains focusing on women and young children.

CapDev and education research, such as the question of how to develop concerted approaches to advocacy, nutrition education and the adoption of safety standards.

Implementation mechanisms: CapDev in the second phase of RTB will function along three strategic pillars:

1. The projects that are part of a **cluster** will receive support to discuss, design and integrate CapDev interventions in alignment with the CGIAR CapDev framework, ensuring that the interventions are needs-based and aligned with the flagship's impact pathway and intended outcomes. Priorities will be set to develop a budget that aligns with the CapDev objectives. Monitoring and evaluation indicators will be identified and corresponding M&E activities supported.
2. **FP5** on improved livelihoods at scale entails the CC5.4 on innovation and scaling. As detailed above, this cluster will be the home for research on scaling of technical innovations and provide many opportunities for learning and improving capacity development. Specifically, FP5 will have a research component on stakeholders' capacity to innovate, and provide support functions to RTB clusters through a dedicated community of practice.
3. At the **program** level, we will work with partners to identify strategic CapDev interventions which are considered to entail high learning and impact potential. Those will receive strong support in planning, implementation and M&E. This will support the development of CapDev dedicated impact pathways, and document the outcomes in greater depth beyond project specific activities, in order to be able to reflect fully the achievement of the program and its contributions to the relevant CapDev sub-IDOs.

Three **principles** for the implementation of CapDev interventions are (1) to pursue and foster partnerships with complementary capacities that respond to CapDev needs expressed by stakeholders. This has already been a strength of the program's first phase. RTB will also (2) fully tap into the resources provided by the CGIAR CapDev community of practice, like the CapDev framework and the suggested indicators for M&E of each element. Finally, CapDev professionals will (3) work closely with issues related to data, information, knowledge and communication to allow a maximum level of availability, accessibility and applicability of CapDev products, processes, and lessons learned.

CapDev impact pathway: The tables below describe the impact pathways for each of the five flagships. The entry points are the capacity development elements that the flagship plans to implement. The CapDev outputs and outcomes derive from the flagship narratives and corresponding impact pathways. The sub-IDOs are those prioritized by each flagship, and the indicators are taken from the Performance Indicator Matrix.

FP 1: Discovery research for enhanced utilization of RTB genetic resources

CapDev elements	CapDev Outputs	FP CapDev Outcomes	Sub IDOs	Indicators
(4) Developing future research leaders through fellowships	Short and long term individual training for breeders, geneticists, genetic resource managers; staff exchanges; training at MSC, PHD level from RTB countries and women scientists	Researchers in RTB countries have improved their skills for implementing clonal crop breeding	Enhanced institutional capacity of partner research organizations Enhanced individual capacity in partner research organizations	Partner institutions identify at least 20 candidates (at least 30% female) for advanced degree training At least 15 candidates supported for advanced degree training, of which at least 30% are female (by 2020)
(5) Gender-responsive approaches throughout capacity development	Training approaches and material tailored for breeders and geneticists on how to make breeding objectives more responsive to the preferences of both male and female farmers and to consumer preferences	Breeders and geneticists collaborating with national programs in RTB countries introduced participatory gender-responsive methods for trait definition and selection in their own projects		Breeding community of practice established in collaboration with at least 15 stakeholders in 6 countries (2017)
(6) Institutional strengthening	Information and advocacy strategies and materials on non-conventional breeding for governments and regulatory agencies based on derived prototypes or products with new traits	NARS, ARIs and CGIAR Centers have shared more effectively genetic resources, data, services and facilities		Breeding community of practice under implementation in collaboration with at least 20 stakeholders in 6 countries (2019)
(8) Organizational development	Organizational arrangements and partnership models for strengthening and co-developing advanced labs Knowledge sharing mechanisms developed and maintained through Breeding CoP			Participatory methods for trait definition and selection (including at least 30% of female participants) used in 50% of RTB/partners joint activities (2018) Enhanced capacity of at least 400 R&D partners, of which at least 30% are female, through short and long term trainings (2022)

FP2: Adapted productive varieties and quality seed of RTB crops

CapDev elements	Cap Dev Outputs	FP CapDev Outcomes	Sub IDOs	Indicators
(2) Design and delivery of innovative learning and information materials and approaches	E-learning training modules on technical protocols, guidelines on best practices and principles; interactive decision support tools, as e.g. the ProMusa network (www.promusa.org/musapedia).	R&D partners have applied evidence-based analytical procedures to develop reliable, robust, profitable and sustainable seed system interventions, identified key research questions, and speed-up the development and dissemination of new varieties. Researchers in RTB have implemented conventional and advanced breeding and selection methods Partners have fostered women's participation, co-developed and used participatory gender-sensitive and gender-responsive research methods RTB actors along the value chain have applied improved technical and business seed systems skills	Enhanced individual capacity	Women's participation increased by 30% for the design of RTB supported capacity development and extension interventions in the field of seed multiplication / seed management / crop management designed 150 individuals (50% female) trained through long term programs (e.g. MSc and PhD students) (2021) Every year, 8,000 R&D stakeholders (50% female) trained through short term programs on designing and implementing smallholder-oriented breeding programs and sustainable seed systems (2022)
(4) Developing future research leaders through fellowships	Training at MSc and PhD level; hands-on mentorships; sponsorships to meetings.			
(5) Gender-responsive approaches throughout capacity development.	Strategies that assure women farmers' participation in training and benefits from it.			
(6) Institutional strengthening	Co-investment strategies with R&D partners in facilities, equipment, and provision of information and recurrent backstopping to improve institutional skill sets.			
(8) Organizational learning and development	Training and action learning with male and female farmers, processors, and public and private seed multipliers on varietal selection, cultural practices, postharvest techniques, seed production, disease diagnostics and quality control; capacity strengthening of breeders in conventional and advanced breeding and selection methods.			

FP3: Resilient RTB crops

CapDev element	Cap Dev Outputs	CapDev Outcomes	Sub IDOs	Indicators
(5) Gender-responsive approaches throughout capacity development	Tools and methods for CapDev on gender-responsive approaches in designing and disseminating crop management practices and IPDM. Mentoring, post-graduate training for women; gender-responsive learning and extension. Development of media, materials for awareness and action.	Research institutes, extensions systems and NGOs working on ICM and IPDM, have introduced gender-responsive approaches in their technical assistance and capacity development activities Plant health agencies and national governments have elaborated and/or adapted regulatory frameworks and policies based on scientific evidences	Increased capacity for innovation in partner org. and communities	Gender differentiated needs assessment of capacity development available in at least 8 pest/country combinations (2017) Women's participation increased by at least 30% for the design of RTB supported capacity development and extension interventions in the field of IPM and ICM (2019) At least 33% of female participants ensured in all capacity development efforts (including extension services providing advice on ICM and IPM) (2020)
(6) Institutional Strengthening	Advocacy approaches to use improved data management, define conducive regulatory frameworks for movement and exchange of planting material	NARS, extension systems, NGOs and the private sector disseminate validated technologies and practices		Multi-stakeholder initiatives for promoting refinement and scale of selected sustainable management practices under implementation in 10 countries (2020) Growing number of extension services (governmental org., NGOs and private sector) providing advice on improved ICM and IPDM increased (2022)
(8) Organizational Development	FP3: ICM, IPM learning platforms. Participatory action research on expert systems			

FP4: Nutritious RTB foods and value added through post-harvest innovation

CapDev element	Cap Dev Outputs	CapDev Outcomes	Sub IDOs	Indicators
(2) Design and delivery of innovative learning materials and approaches	Training-of-trainers courses; development and promotion of recipes	NARS and private sector have engaged with end users to adapt environmentally friendly processing and storage technologies with focus on women and youth entrepreneurship.	Increased capacity for innovation in partner org. and communities	Dissemination approaches more effective and efficient through use of improved education/counseling and SBCC methods, better targeting through partnerships with nutrition/health agencies, and stronger monitoring and learning based on improved metrics and processes - applied to OFSP, biofortified cassava and additional RTB crops in 10 countries (2018)
(5) Gender-responsive approaches throughout capacity development.	Strategies to enhance the capacity of boys and girls to develop as entrepreneurs along the postharvest value chain, integration of key messages into school curricula, investment in education, trade schools	Health, education, and agriculture stakeholders established platforms and partnership arrangements for designing and implementing food-based nutrition programs and value chains focusing on women and young children.		Novel institutional arrangements (e.g. research-private industry innovation platforms) established in 4 countries to foster innovation and scaling of RTB processing technologies and value chains (2019)
(6) Institutional strengthening	Partnership models, value chain approaches, and strong evidence base to strengthen institutional capacity for going to scale			10,000 individuals (e.g. bakers, processors, equipment fabricators, extension officers), of which at least 33% are female, trained in business and products development (2021)
(8) Organizational learning and development	Engagement strategies with end users to adapt environmentally friendly processing and storage technologies; platforms for knowledge exchange on postharvest technologies and nutritious RTB products	Researchers, private sector and government agencies actively exchange and utilize knowledge on successful technologies and products to accelerate gains		60 partner development organizations, including women's networks and alliances, having increased their capacity for innovation (e.g. enhanced human capital and improved collaboration network in relevant domains) (2022)
(9) Research on capacity development	Evidence-based CapDev strategies on how to develop concerted approaches to advocacy, nutrition education, and the adoption of safety standards			

FP5: Improved Livelihoods at Scale

CapDev element	Cap Dev Outputs	CapDev Outcomes	Sub IDOs	Indicators
(3) Develop CRPs and Center partnering capacity	Approaches to CapDev on partnership for scaling models	RTB FPs have developed partnership diversification options and adopt more effective partnering tools	Improved capacity of women and young people to participate in decision-making Increased capacity to adopt research outputs Increased capacity for innovation Enhanced institutional capacity Enhanced individual capacity	At least 20% increase of female scientists participating in key-decision-making processes concerning RTB interventions and strategies (2020)
(5) Gender-responsive approaches throughout capacity development	Framework to learn, link and leverage resources to increase youth employment and agripreneurship Tools and methods for CapDev on gender responsive and transformative approaches	RTB scientists have used detailed current scenarios for youth engagement in RTB production, value addition and marketing		Gender and youth capacity development strategies and training materials developed and/or adapted in collaboration with key partners in xx countries (2019) At least 1,500 users of RTB knowledge sharing mechanisms with strengthened capacity for designing, implementing and assessing RTB research (2021)
(7) Planning, Monitoring and evaluation (PM&E) of capacity development	PM&E system on progress towards completion of CapDev outcomes capturing the gender dimension of related CapDev variables	RTB and partners have implemented CapDev activities that strengthen gender-responsive R&D along impact pathways		150 individuals (50% female) trained through long term programs (e.g. MSc and PhD students) (2022)
(9) Research on capacity development	Evidences on best CapDev models and mechanisms, ICT's, CapDev and scaling, communication for scaling and operationalizing capacity to innovate	RTB has used collaborative M&EL systems and IA to measure progress towards impact and facilitate continuous improvement		At least 44 bi-annual stakeholder meetings held across target countries for co-design of impact pathways and M&EL around implementation, including needs assessment and customized product development (2019)
(10) Capacity to innovate	Training and co-learning approaches with researchers of RTB centers and international and national partner organizations to upgrade skills for customizing research outputs into scalable technologies, and for brokering relations between diverse stakeholders to achieve expected changes. Case-based learning sessions around successful processes of knowledge translation and brokerage, identification of best practices and CapDev champions	R&D partners have implemented more effective knowledge sharing and CapDev approaches and tools		At least 1 systems innovation coalition per action site experiment with prioritized alternative interventions options (2017) RTB delivery flagships and at least 55 research and development partner organizations with more gender-responsive planning and implementation processes, reflected in at least 5 additional collaborative arrangements with public sector and civil society organizations supporting gender transformation (2022)

ANNEX 3: RTB Gender

Key goal and objectives

RTB's gender objective is to improve food security and reduce poverty while strengthening gender equity. For this to happen, both men and women farmers must be able to benefit from science and technology interventions developed by the RTB research team and its partners. A key goal of the gender strategy is to level the playing field where possible by providing access to knowledge, capacity building, and market opportunities, and by ensuring that the technology developed through the program is made available to both sexes. However, RTB research and evaluations have shown that men and women are not always equally benefiting from RTB technologies. For example, women may adopt technologies more slowly than men due to gender related constraints, such as lack of access to knowledge, information, training, resources and decision making powers within the home (Mudege, et al. 2015)³. Thus in order to ensure that RTB research and technology development contributes to meeting gender equitable IDOs and targets RTB aims to 1) mainstream gender across the RTB flagships and clusters with gender integrated research 2) undertake strategic gender research to build a body of knowledge on gender and agri-food system innovation for RTB crops.

RTB will develop a set of gender impact indicators to monitor changes and access to resources, in agricultural production, research and entrepreneurship as a result of adoption of RTB technologies and innovations. In order to equip RTB scientists and partners to do gender-responsive research and achieve gender transformational outcomes and empowerment of women and youth, guidelines and briefs on gender research methods and context-specific gender situational analyses will be developed. A gender capacity development program will ensure that 1) expertise on gender research is available within RTB and 2) non-gender experts within RTB know when and how to make use of this expertise.

To achieve this, the program is guided by the RTB gender strategy which outlines priority areas for gender research. In preparation for RTB Phase II, the strategy will be revisited, updated and operationalized taking into consideration lessons learned (see 1.4) from RTB Phase I and in alignment with the new RTB structure and flagships. A cross cutting Flagship Project 5 (FP5) contains CC5.3 on gender equitable development and youth employment that will provide learning and support for all FPs to contribute towards achieving gender responsive sub-IDOs – gender equitable control of productive assets and resources, and improved capacity of women and young people to participate in decision-making. RTB will mainstream gender through integrated and strategic gender research.

Integrated Gender Research

Integrated Gender Research is the systematic integration of gender into research process— priority setting, planning, design, implementation, monitoring and evaluation - and into the management of this process (Ashby et al, 2013)⁴. The purpose of gender integration is to consider gender norms and cultural practices when designing and implementing research in order to develop strategies to address gender based inequalities when developing a program or research strategy. In RTB, this means integrating a gender dimension into Flagships 1 to 5. Key to facilitating gender integration in these flagships is to ensure that there are resources set aside for integrated gender research across the flagships.

³ Mudege, N.N.; T.; Kapalsa; Chevo, T.; Nyekanyeka, E.; Demo, P. 2015. Gender norms and the marketing of seeds and ware potatoes in Malawi. Journal Article the Journal of Gender, Agricultural and Food security. Vol 1, Issue 2, pp 18-41. Africa Centre for Gender, Social Research and Impact Assessment: Nairobi.

⁴ Ashby, J.A., Annina Lubbock, Hendrika Stuart (2013): Assessment of the Status of Gender Mainstreaming in CGIAR Research Programs CGIAR Consortium.

Integrated gender research will involve some or all of the following: methodological aspects of collection and use of relevant sex-disaggregated information, analysis of gender-related constraints and opportunities, studies of the impact of research and development on gender equality outcomes. Integrated gender research will focus on specific key areas within each of the flagships (Table 1).

Table 1. Gender integration options by Flagship Project

Flagships	Gender Research Objective
FP1: Discovery research for enhanced utilization of RTB genetic resources	Develop a gendered understanding of indigenous knowledge and practice in the conservation and use of genetic resources.
FP2: Adapted productive varieties and quality seed of RTB crops	Characterize gender differentiated preferences for traits and their consequences, in order to help breeding strategies accelerate varietal development.
FP3: Resilient RTB crops	Understand local knowledge of male and female farmers in disease management in order to develop information and communications strategies that inform both women and men of safe pest and disease control methods.
FP4: Nutritious food and value added through postharvest innovation	Develop inclusive RTB value chains that improve access to and utilization of RTB products for nutrition and health as well as to promote gender equity in the distribution of benefits from increased commercialization.
FP 5: Integrated systems for livelihoods	Ensure that developed RTB technologies, tools and innovations are useful to men, women and youth farmers and lead to livelihood improvement and increased wellbeing

Under Integrated gender research, RTB will also undertake selected studies on topics that have greater gender relevance and contribute towards developing gender specific tools and methods, and explore the potential of undertaking cross-CRP collaborations for co-investments and complementary gender research. The trainers guide on Gender Integrated Participatory Market Chain Approach (PMCA) is one of the examples of PIM and RTB cross collaboration work in Phase I. Guidelines to integrate a gender perspective in CGIAR centers intervention in value chain development for RTB crops will be piloted in Phase II. Tools, guidelines and modules for gender responsive participatory varietal selection will be rolled out.

In order to meet flagship objectives RTB will ensure that gender budgets are adequate. For example, in addition to budgeting for personnel and sex disaggregated surveys we would ensure increased budget for gender integrated research as well as outcome support to achieving more equitable access to RTB technologies. Most of the gender work conducted in RTB has been on nutritious foods, value addition through post-harvest processing and trait selection in breeding and varietal selection. One of the key areas on which RTB would like to focus is integrating gendered knowledge and preferences into banana breeding in Tanzania and on cassava trait preference to inform genomics assisted cassava breeding. Research in cassava breeding will be undertaken in a close collaboration with the NEXTGEN cassava project⁵ and various national partners in East and West Africa. Likewise, banana breeding will be done with the Breeding Better East African Highland Bananas (BB-EAHB) project and other national partners in Tanzania. Research on gender and potato trait preference will continue in selected SSA countries. While

⁵ NEXTGEN cassava project is an initiative taken by Cornell University researchers with various national and international partners. It is supported by the Bill & Melinda Gates Foundation and the UK Department for International Development (<http://www.nextgencassava.org/>).

this is important in the next phase we would also like to see more investments in resilient cropping systems and discovery research.

To further institutionalize integrated gender research, RTB has adopted an approach towards harmonizing and strengthening gender capacity for RTB in-house staff members and partners by continuing to undertake capacity development activities in close coordination with RTB partnering centers' GFPs and following up with the trained participants to establish a feedback loop for monitoring, evaluation and learning. We expect that this work will continue in Phase II.

Strategic gender research

Strategic gender research refers to specialized studies on dimensions of gender relations that can affect research and development outcomes. The main research focus is on gender roles, norms and agency, rather than on technical issues, into which gender is integrated. Strategic gender research in RTB is housed in FP 5. This type of research can crosscut flagships and Centers and is of importance to strengthening equity and efficiency. Strategic gender research is also expected to contribute insights and research conclusions to all RTB flagships and thus strengthen integrated gender research. Examples of research questions and areas of focus of strategic gender research are:

- How do gender norms and agency advance or impede the capacity to innovate and to adopt technology in agriculture and NRM across different contexts?
- How do new agricultural technologies or practices affect gender norms and agency across different contexts? Under what conditions can they do harm to women? And how are gender norms and women's and men's agency changing, and under what conditions do these changes catalyze innovation and lead to desired development outcomes (CGIAR SLOs)? What contextual factors influence this relationship?
- What are the gender roles and dimensions of inequality in RTB seed systems?
- How does intra-household resource use and decision-making for equity and innovation vary in different RTB agri-food systems?
- What are the gender implications of agro-industrialization and gender dimensions in access to RTB based agro enterprises in different regions and countries?

To answer these questions, RTB is collaborating with other CRPs in the CGIAR global study on Enabling Gender Equality in Agriculture and Natural Resource Management (GENNOVATE) and has a total of 15 case-studies in RTB target countries: Uganda (4), Malawi (2), Burundi (1), Nigeria (2), Colombia (4), Bangladesh (2) and Vietnam (2). The first few products of this study are expected to come out as scientific publications, reports, guidelines and methods in early 2017. FP5 on improved livelihoods at scale will make it possible to pilot GENNOVATE lessons with the objective of contributing to gender related sub-IDOs and IDOs.

In Phase I it was learned that when interventions do not address underlying social structures and gender norms related to household decision making and control of income agriculture research may not benefit women. For instance, although a seed potato project aimed to ensure that men and women have access to clean seed, women did not have access to quality potato seed because they lacked access to credit and training, and did not control household income to purchase seed (Mudege et al 2015). Research on long shelf life banana and potato ambient storage technology in Uganda also had similar results. Gender norms and ideologies can be barriers to access, therefore projects need to address these in order to contribute to development outcomes including women's empowerment. The strategic gender research will therefore make significant contributions towards meeting IDOs.

Strategic gender research creates an enabling environment for integrated gender research and sets the scene for gender transformative outcomes. Gender transformative outcomes are those outcomes where both men and women are helped while gender roles are transformed and more gender-equitable relationships between men and women are promoted. However, it is more challenging to achieve gender-transformative outcomes, given the structural gender inequalities in many sectors that are not easily influenced by an agricultural research program. Research in RTB has shown that addressing gender norms to achieve transformation is not always easy as researchers, and in many cases extension officers and partners, often lack experience or are uncomfortable addressing these issues. As noted below RTB will reevaluate its partnership approach to ensure that non-traditional partners who can help us to achieve transformative outcomes are engaged.

Impact pathway

Measurement of progress towards gender impact in RTB will be systematic and undertaken at all stages of the research cycle. It will be based on the regular monitoring of a set of identified gender responsive indicators which will contribute towards achieving gender sub-IDs and IDs. These indicators will be developed at all levels (products, research and development outcomes) from the impact pathway for both integrated and strategic gender research.

RTB envisages two main strands in the impact pathway. The first contributes to the technical research undertaken in integrated gender research across all flagships. Technical research will focus on topics which have greater gender relevance and also contribute towards developing gender specific tools and methods. These areas will be identified in a priority assessment exercise for gender research during the updating exercise of the RTB gender strategy. The second strand will concentrate on catalyzing a change in attitudes and practices of next users and end users in relation to adoption and use of gender and youth responsive outcomes and results of RTB flagships. This change in attitude and practice is achieved through harmonizing and strengthening the capacity of RTB researchers, scientists and partners through investments and interventions on capacity development and an interdisciplinary teamwork approach, which promotes continuous interactions among a team of experts while undertaking empirical integrated gender research. One of the underlying assumptions that emerged from gender work in Phase I is that as knowledge, understanding and skills on gender responsive research improve, the more gender equity concerns are taken into consideration by scientists, researchers and partners while setting research priorities and designing questions.

Integrated gender research contributes to gender responsive outcomes while strategic gender research can build on this to contribute to gender transformative outcomes. Through the use of integrated gender and strategic gender research the gender impact pathway will contribute to two IDs (See Fig. 1):

1. Increased and more gender-equitable income for poor participants in RTB value chains (SLO 1, 2)
2. More effective policies supporting development and use of pro-poor and gender inclusive RTB technologies developed and adopted by agricultural organizations, national governments and international bodies (SLO 1, 2)

Progress towards these IDs will be tracked using milestones and indicators that have logical links to the impact pathway. These indicators will be developed based on outcomes delineated in the Performance Indicator Matrix.

Figure 1 shows the gender impact pathway depicting outcomes from Integrated and strategic gender research with associated risks and assumptions.

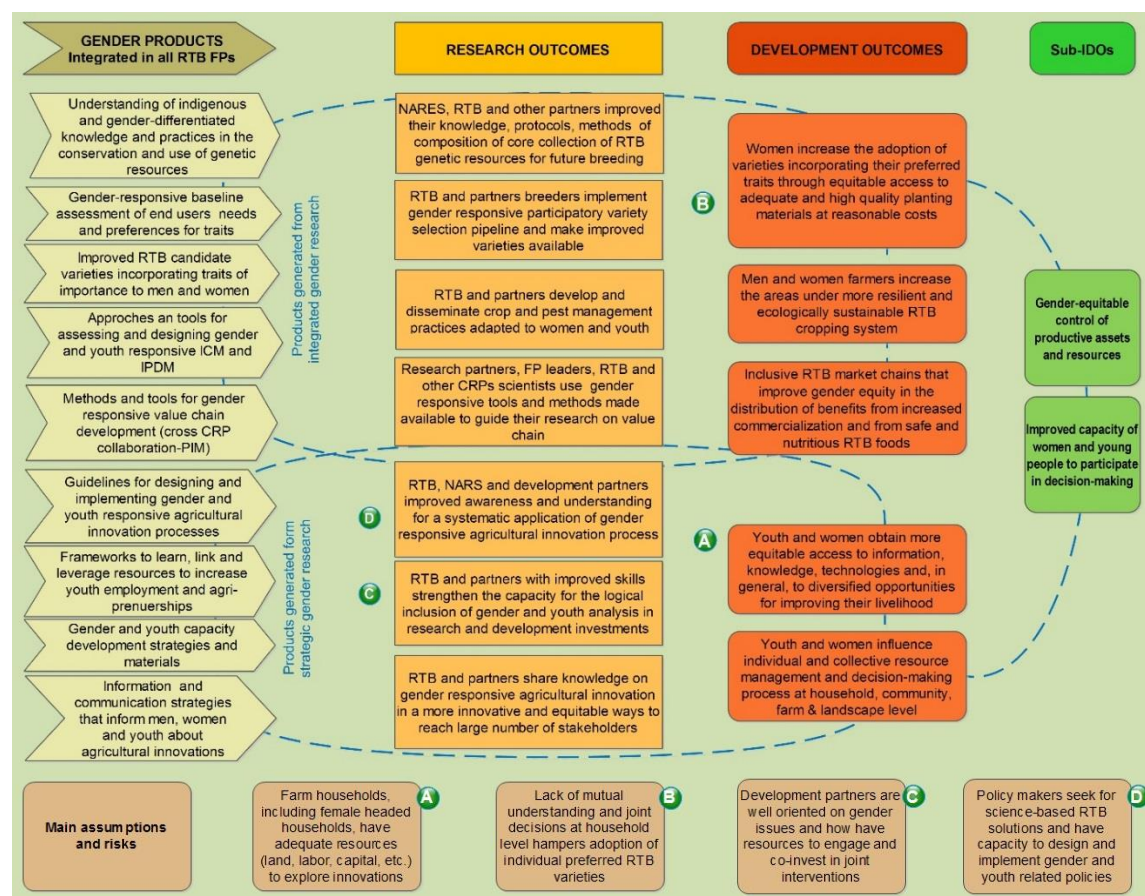


Figure 1. Gender impact pathway

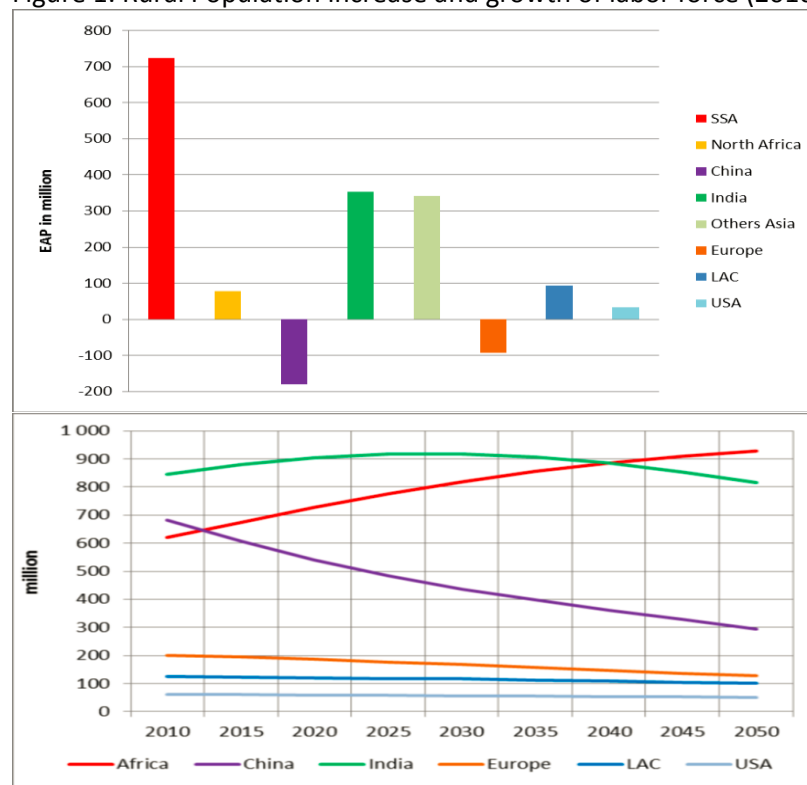
ANNEX 4: RTB Youth Strategy

Background and rationale

Youth unemployment is a major challenge, but can also be an opportunity for youth to become the engine, driving new agriculture and agribusiness enterprises as well as rural transformation (Brooks et al. 2012). Continued population growth in certain regions means that there are large numbers of young people entering the labor market each year, especially in SSA, South and SE Asia. Each year in Africa alone 10-12 million young people seek to enter the workforce, too many without success (AGRA 2015). While agriculture and agribusiness provide opportunities for youth, many face hurdles in trying to earn a livelihood from these areas (FAO, CTA IFAD 2014).

Projections by world urbanization prospects and world population prospects estimate that until 2050, rural populations will decrease globally (-150m), but populations in rural SSA will continue to grow by 350m, and rural South Asia will increase until mid-2040 (Losch, 2015). In these two regions rising rural populations pose challenges for the absorption of a growing labor force and for its consequences on demographic densities, farm structures and natural resources. The highest population growth is occurring in SSA, South and SE Asia (Figure 1). Africa will account for 60% of the world's increased labor force with research showing that, between now and 2030, SSA's economies will have to incorporate 370m youth, 220m in rural areas and 150m in cities.

Figure 1. Rural Population Increase and growth of labor force (2010-2050)



Source: Losch, 2015

Exclusion of youth from agriculture for research and development may lead to negative social externalities and reinforce existing unequal power relations that exacerbate their conditions in challenging social contexts. Agriculture related youth programs and youth oriented research can provide opportunities to address the feminization of agricultural labor and build a critical mass of youth with skills and capacity to seize opportunities in the agricultural sector. Therefore, specific considerations of the challenges facing youth must be embedded in the overall program strategy and approach.

Moreover, rural educated youth in developing countries are gradually disengaging from agricultural sector activities and migrating to urban areas. Those who remain in rural areas often have fewer education and economic opportunities. For example, young girls in rural areas often marry at an early age according to local and customary social traditions. Such practices have health impacts, i.e. child birth complications, and affect their opportunities to pursue activities outside the household. Gender norms often relegate women and girls to domestic chores and childcare activities.

Early analysis of GENNOVATE data from RTB and Humidtropics in Western Kenya revealed that girls face more challenges to continuing education than boys. These stem from parents preferential treatment of boys in the household, and early pregnancies. Boys cited problems of high unemployment and high incidence of drug and alcohol abuse that trap youth in poverty. It is thus important to have a systematic youth analysis of key production constraints, opportunities and value chains vis-à-vis RTB crops to ensure that both young girls and boys benefit.

The youth rural to urban migration often leaves a gap in which small family farms with specific labor shortages for physically demanding tasks of ploughing, harvesting, and transporting are not met. This may require families to change to less labor- intensive crops of potential lower economic and nutritional value. Today's youth have higher rates of literacy and experience with IT, social media and technology platforms than previous generations. Engaging them in various innovative and climate resilient production and management systems, partnership building and marketing will help the RTB program not only in to harness their potential and contribute to a modern agricultural system with online record, new technologies and markets.

Objective and approach of engaging youth in the RTB program

RTB will seek to engage youth as a key stakeholder with an overall objective to develop their capacity, and create more economic opportunities to engage them in RTB linked enterprises. RTB will link practical initiatives to engage youth in pilot sites with youth analysis as a framework to learn, link and leverage resources to increase youth employment, including:

1. What are the different roles, responsibilities, assets, and agency of young men and women (compared with older men and women), including their differential access to, control over, and use of natural, financial, social, political, and infrastructure-related resources?
2. What are the aspirations of youth considering different contexts and gender differences?
3. Which technical breakthroughs in RTB production and processing offer best opportunities for youth advancement and how are they best packaged?
4. What incentives are required to best strengthen business skills among youth?
5. How do the yields and profits of accelerated youth agricultural ventures based upon RTB technologies compare to other options, and how can they be optimized?

Youth analysis and practical action to stimulate youth employment will be integrated in different FPs. In addition, RTB has a dedicated cluster for gender equitable development and youth employment in FP5.

This will learn from and build on the IITA youth agriprenneur initiative (see Box 1) which engaged youth in crop production practices, seed multiplication, agribusiness, including commercial processing and sale of Vitamin A rich cassava flour, and is now in a process of reviewing the initiative to scale up. Currently there are established six R4D platforms (Burundi, DDRC, Ethiopia, Kenya, Rwanda and Uganda) and 12 innovation platforms in six different countries in East and Central Africa.

This initiative is linked to the gender equitable development and youth employment cluster under FP5 and supported by the RTB gender strategy. The gender and youth cluster is allied to the youth strategy to achieve gender and youth responsive IDOs in all flagships and clusters. Technical backstopping, mentoring and coaching

Box1: Anecdote from Ma Kahasha

“My training in Ibadan was a great experience in my life as it has helped me to see and appreciate agriculture in various forms. Previously, I had a negative view of agriculture but this training has changed it positively. During this training I got an opportunity to visit Thai farm and Niji farm and these visits motivated me. In fact it helped me to be aware of the many agricultural opportunities that youth can engage with, such as agribusiness. I really appreciate this initiative of IITA that aims to engage more young boys and girls in agribusiness as a means of alleviating national and international youth unemployment, which is one of the major challenges of our decade”

~Gracia Kahasha

Source: IITA Youth Agripreneurs special issue February 2014

within multidisciplinary teams including RTB partners like young men and women farmers and youth organizations representatives, will also lead to adoption and generation of gender and youth responsive cluster and flagships outcomes. This will contribute to sub-IDOs including improved capacity of women and young people to participate in decision –making and youth and gender related IDOs.

Partnership and outreach

For partnership and outreach, youth related activities link with the RTB gender partnership approach by focusing on partnership with young farmers and youth organizations, NARES, NGOs, private sector, women’s networks and youth groups to support delivery of new technologies developed by research.

RTB has established a partnership initiative with universities to increase gender research in RTB project sites and to provide research opportunities, field sites, networks, technical, and project support for graduate students and visiting scholars. This initiative will raise awareness of CGIAR and RTB work on university campuses and encourage young graduate students to pursue research on gender focused research. Building on this partnership initiative, RTB will try to expand the youth program and explore linkages with university faculty to find graduate students who are interested to work on youth research areas that are of prime interest of RTB. Outreach activities will target three geographic regions of RTB—Asia, Latin America and Africa.

Monitoring and evaluation

RTB will develop youth indicators and include in M&E in close collaboration with partners and stakeholders. However, the collection and use of age- and sex-disaggregated data, application of youth and trend analysis in social norms, attitudes, and behaviors that influence young women’s and men’s

aspirations and needs, preferences for and adoption of innovations made by RTB scientists and partners is contemplated in the existing gender and youth cluster as part of M&E system.

Budget

There is no separate budgetary allocation for youth research on RTB from Windows 1 and 2 in first phase. RTB Phase II has a specific cluster on gender and youth, for which a budget allocation and specific budget line for youth related research will be articulated. Moreover, we will pursue collaborations with strategic partners and generate new bilateral project proposals for this important area, potentially linked with agripreneurs.

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ANNEX 5: RTB Results-based management strategy

1. Results-Based Management strategy

a. Purpose

RTB will strengthen implementation of RBM, piloted in Phase I by RTB ([see RTB-Brief 1](#)) and Humidtropics ([see Humidtropics presentation](#)), in order to: (1) improve program performance; (2) strengthen a results-oriented culture for the planning, managing and assessment of research for development interventions; (3) support adaptive management, organizational learning and informed decision-making at all levels; and (4) promote greater accountability, transparency and value for money.

b. Principles

The RBM strategy is founded on five principles: (1) a clear and logical program design that ties resources and activities to expected results; (2) description of roles and responsibilities for RTB scientists/management as well as for partners involved in implementation; (3) sound judgments on how to improve performance on an ongoing basis; (4) demonstrated accountability and benefits to stakeholders; and (5) reliable and timely information made available to CGIAR and key stakeholders.

c. Steps in managing for results

Given that RBM is a management strategy, it will be part of the overall ongoing CRP life-cycle (see Fig. 1) and will include the following key steps:

- Defining and revising, based on evidences and lessons learnt, the impact pathways at all program levels;
- Strategic budget allocation based on ex-ante assessment of expected results and corroborated by ex-post IA results;
- Planning and budgeting for monitoring and evaluation;
- Establishing implementing and monitoring responsibilities and accountabilities internally and with partners;
- Monitoring and analyzing performance and risks information;
- Using MEIA findings and risks information for adaptive management and organizational learning;
- Annual rewarding of good performances through performance-based budgeting (not intended to modify strategic budget allocation);
- Reporting performances and results.

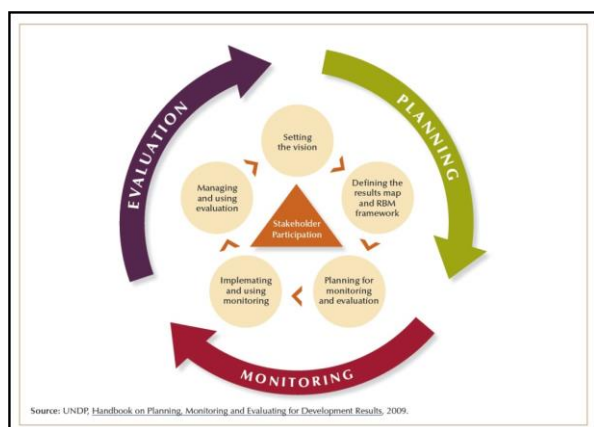


Figure 1 – The RBM life-cycle approach

d. Implementation within CRP

The CRP and flagship theories of change and impact pathways as presented in the proposal above (see section 1.0.3 and 2.3) were developed using a bottom-up approach. To stress the centrality of strong alliances with stakeholders, RTB started the development of ToCs at the cluster level involving cluster teams and partners. These results were then consolidated at the higher levels.

Not all the clusters had the opportunity to fine-tune their impact pathways with stakeholders during the proposal development. RTB will then continue applying the methodology refined with the RBM pilot at the beginning of the new phase. Stakeholders and partners involved with a selected RTB cluster at focus country and sub-regional levels will co-develop impact pathways and agree on the framework for joint activities and M&E mechanisms through participatory workshops. These workshops, jointly planned with other CRPs, will contribute in the second phase to site integration strategies and plans. Stakeholders with experience in gender integration and mobilizing women and other social groups will be included.

The set of nested ToCs and impact pathways constitute the backbone of the RTB's RBM framework. They serve as the CRP's hypotheses of the way change is expected to occur from output to outcome and impact. They are meant to be dynamic documents and adapted as evidence is further collected. For all FPs and clusters, research products were identified, discovery pipelines - in the case of FP1 - and impact pathways - for the other FPs - tentatively mapped out, scaling strategies agreed and indicators for (Sub)-IDOs and lower result levels constructed to provide the basis for results-based management (RBM) and are shown in Performance Indicator Matrix, tables B, C and D.

e. Interoperable tools to support RBM implementation

RTB is characterized by a broad thematic and geographical area of intervention, a large number of partners contributing to its implementation and a light structure for its management. To address and adapt its management to this complexity, RTB needs to maintain its RBM framework flexible and iterative. This situation requires the establishment of clear flow of information and a good capacity to manage the quantity and diversity of data generated by all the implementing stakeholders. In order to respond to this need, in 2015, RTB started a collaboration with Dryland Systems (DS) to adapt and develop the web-based Planning, Monitoring, Evaluation and Learning platform (PMELP) initiated by DS. This platform will be adopted by DCL in the coming phase and as center-wide solution by ICARDA and CIP. The platform (<http://mel.cgiar.org/>) enables better RBM including planning, reporting, coordination, risk management,

performance evaluation, as well as knowledge sharing and learning amongst different groups of stakeholders (donors, partners, and scientists) within and across CRPs and CG centers.

The PMEL platform supports and facilitates the collection, storage, analysis and sharing of data on technical implementation of CRPs and links these data with financial information thereby enabling timely and informed decision-making, transparent reporting to donors and reduction in administrative/transaction time and costs.

Some of the key features are:

- Research planning, reporting and monitoring tool with customizable workflow and chain of approvals;
- Data management for research outputs, CapDev and outcome indicators across CRPs/CG centers to reduce burden of data input and facilitate comparison and analysis across interventions;
- Outcome story writing tool for sourcing high-impact communications;
- Data management on partnerships and customizable survey for partnership assessment (under development);
- Customizable alignment with internal Finance and HR management systems (e.g. OCS, Talent Management);
- Customizable alignment with open repositories (e.g. D-Space) and internal sharing systems (e.g. Sharepoint);
- Multiple data and document tagging that avoids double/multiple uploading on different organizational systems;
- Enables timely production of different types of reports based on needs and requirements of different users and audiences including customization of bilateral projects reporting to serve specific donors requirements;
- Compatible with Open Access requirements, using Dublin Core Metadata. It can be linked with any Open Access Repository as well as using any Creative Commons license.

Furthermore, PMEL platform enables Learning and Knowledge sharing via:

- Integration with Open repository (linkage with D-Space);
- Discussion Forums to enhance collaboration amongst stakeholders across different geographies, CRPs, CG centers, and partners.

The PMEL platform uses full stack open source environment.

2. Monitoring, Evaluation, Learning and Impact Assessment (MELIA)

a. Purpose

In order to effectively implement the RBM framework, strengthening monitoring, evaluation, learning and impact assessment (MELIA) will be necessary at both project and program levels. A robust and strategic plan is proposed and will support CRP cycle of planning, budget allocation and reporting steps.

RTB will use a modular approach for the implementation of the strategy, which will include a suite of tools, guidelines and best practices. Furthermore, plans will be put in place to systematically review the strategy and make necessary adjustments, where required, to better assist staff and management in delivering and improving the performance of RTB. It is expected that the strategy and its modules will improve over time as more information is gathered and experience is gained in implementing such a framework.

MELIA will support RBM implementation while playing the following core functions:

1. Provide data, information, and evidences on delivering outputs, contributing to outcomes and

- ensuring value for money;
2. Review the consistency of ToC, document evidences showing causal relationships among outputs and outcomes, identify unintended outcomes;
 3. Collect and analyze information on partnership effectiveness in achieving results;
 4. Organize knowledge and experience sharing within the program members and among partners.

b. MELIA strategy modules

Modules constituting the MELIA strategy are strongly complementary and interconnected as presented in the following sections.

Monitoring, Evaluation and Learning modules are mostly under the direct coordination of the Program Management Unit. Implementing responsibilities are declined following the programmatic structures (CRP, FPs, clusters). Coordination and alignment between RBM framework and Project-specific frameworks (Bilateral and W3) is foreseen to limit duplications in management and reporting lines. The Impact assessment modules is embedded into the program structure through the cluster CC5.1 – Foresight and impact assessment – that will be in charge of its implementation. In addition, by developing mechanisms and tools to collecting and storing data for impact assessment studies, CC5.1 strengthens the consistency of information produced across the CRP and adds value to data generated at the cluster level and through the monitoring module.

1) Monitoring

The RTB monitoring module is organized in two main components: outputs and outcomes.

The output monitoring component supports the effective and timely delivery of planned research outputs (e.g. knowledge, tools, technologies, etc.). This component is strongly linked with management of annual budgets and measurement of annual CRP performances (most the annual performance indicators will be tracked using information generated by this component). Tracking of CapDev activities (e.g. # trainings by topic and typology) is also performed here. Output monitoring reposes on the contribution of individual scientists; they provide information and data that will be validated and consolidated at the cluster then at the FP level (See Fig. 3).

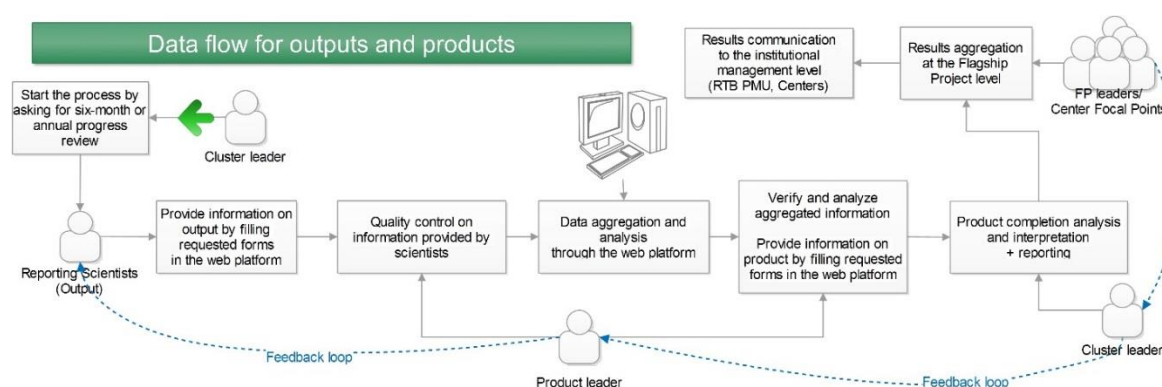


Figure 2 – Schematic flow of data collection and analysis when monitoring outputs and products

The outcome monitoring component focuses on changes in knowledge, attitude and practices that happen at the next- (research outcomes) and end users levels (development outcomes). Results at (Sub)-IDO levels, corresponding to changes in direct benefits for end users and changes that affect agro-ecosystems, are partially covered by this component and partially addressed by evaluation and impact assessment. Outcome monitoring integrates two main approaches:

1) An indicator-based monitoring that will include gender-sensitive measurements and specific indicators for CapDev.

Proposed targets for the (Sub)-IDOs (see Section 1.0.2 and Performance Indicator Matrix) are based on the results of an ex-ante impact assessment exercise ([See RTB working papers for more details](#)). Indicators were drafted at the cluster level and along the impact pathway in order to provide elements that will be useful when performing impact assessment, theory-based evaluations and contribution analysis. Data collection on indicators related to research and development outcomes is based on the harmonization and consolidation of data produced by projects mapped in RTB. The definition of indicators to assess (Sub)-IDOs is being conducted using a two-pronged approach. First, the CRP is seeking indicators already in existence that are credible, well-recognized, accessible, and being monitored by other better positioned organizations (e.g., FAO, WB). A set of indicators for intermediate development outcomes to which RTB will be contributing is proposed (table 1). Indicators at other levels will be developed during the operational phase after proposal submission.

Table 1. SDG framework and indicators under examination (NB. For SDG and SRF coding refer to Fig.4 Sect. 1.2)

Indicators - SDG Framework	SDG	SLO	IDO	Sub-IDO
1. Proportion of population below \$1.25 (PPP) per day (MDG Indicator)	1	1		
2. Proportion of population living below national poverty line, by urban/rural (modified MDG Indicator)	1	1		
3. Multidimensional Poverty Index	1	1		
8. Proportion of population below minimum level of dietary energy consumption (MDG Indicator)	2	2		
12. Percentage of women, 15-49 years of age, who consume at least 5 out of 10 defined food groups	2	2	2.1	2.1.3
13. Crop yield gap (actual yield as % of attainable yield)	2		1.4	1.4.2
14. Number of agricultural extension workers per 1000 farmers [or share of farmers covered by agricultural extension programs and services]	2		D.1	D.1.4
56. Youth employment rate, by formal and informal sector	8		1.3, B.1	1.3.1
79. Net GHG emissions in the Agriculture, Forest and other Land Use (AFOLU) sector (tCO ₂ e)	13		A.1	
85. Annual change in degraded or desertified arable land (% or ha)	15	3	3.3	

Second, in cases where there are no suitable indicators, RTB will develop a new indicator with an efficient monitoring system in close collaboration with the flagship teams. Furthermore, RTB will support and seek to use, where possible, standardized indicators established by national partner systems, the MEL CoP and other communities of practice. The methodology used to identify the targets and to measure progress, as well as key assumptions, will be detailed to ensure transparency. To complete the monitoring plan, data collection sources and methodologies, responsibilities and timelines will be identified for each of the indicators. A variety of methodologies are expected to be used dependent on the indicators, including

document reviews, surveys, case studies, meta-analyses, meta-syntheses, adoption studies, impact assessments.

In cases where data collection will be under RTB responsibility, table 2 presents the expected frequency of reporting per indicator level (first column), country and cluster stage (bottom line). An illustrative set of methods proposed for each indicator level is presented in the last column.

Table 2. Indicators level, frequency of reporting and methods

Indicators level	Frequency of reporting in years			Methods
IDO	x	5-10	5	Impact assessment studies and evaluations realized in CC5.1. Collaboration with other CRPs particularly in countries selected for site integration
DO	x	3-5	3	Adoption studies and surveys realized in CC5.1 or by projects with dedicated funds. Data provided by projects and aggregated Collaboration with other CRPs particularly in countries selected for site integration
RO	1-2	1-2	1-2	Data provided by projects and aggregated
Outputs	1	1	1	Data provided by scientists
cluster stage x Country	Assembly and pilot	Scaling-out	Scaling-up	

2) A descriptive, participatory monitoring looking at processes and causal relationships among outputs and outcomes.

For all the FPs, identification and development of outcome stories will be realized for analyzing both successes and failures (function supported by the IT-platform). In selected clusters, more structured methods (e.g. outcome harvesting, most significant changes) will be tested.

Information on partners and partnerships will be considered in both output and outcome components. Output monitoring will focus on: identification and description of partners, documentation and self-assessment of the collaborations. In the outcome component, through annual meetings and online surveys, partners will be regularly asked to assess the quality of the collaboration, their satisfaction with the products and services delivered by RTB, the changes they perceived thanks to the adaptation/adoption of RTB products and services, the foreseen dissemination strategy (to whom and how are they likely to disseminate those products).

2) Evaluation

RTB underwent in 2015 a full external evaluation, commissioned by IEA, including both summative and formative aspects (i.e. assessment of research outputs and outcomes, evolution trend of RTB over a four years period (2012-2015) in terms of program design and governance and management arrangements, CRP performances related to cross-cutting issues: gender, capacity development, partnerships and communication and knowledge management). Findings of the evaluation already influenced the pre-proposal writing; final conclusions and recommendations have been considered for the development of the full proposal.

Comprehensive CRP evaluations should be coordinated with IEA in 2020/2021 in order to assess the results of Phase II, and key contributions to CGIAR goals and targets and to support key decisions on the extension, resizing and adjustment of the program for a new phase.

A combination of CRP Commissioned External Evaluations (CCEEs), research reviews and evaluative studies is planned to address relevant themes and to prepare and support the IEA external evaluation. Several topics are being considered for CCEEs including the evaluation of one flagship per year under higher levels of W1&2 funding or in alternate years under a lower funding scenario (table 3).

Table 3. Candidate sectors and themes considered in the evaluation plan for CCEEs

Topics	Expected use of evaluation findings
Strategic review of NARS breeding capability for key crops and targeted countries potentially linked with genetic gains platform	• Redefine roles and responsibilities in partnerships; • adjust or reorient capacity development activities in FP1-2; • define a stepwise strategy for the introduction of new breeding methods and tools
Understanding of end-user preferences, orientation and successfulness of breeding programs	• Provide appropriate back-stopping to NARS for cultivar development and release; • evaluation of progress in cross center clusters for varietal development in cassava and bananas; • evaluation of the effectiveness of integration and feedback loops between FP1/FP2 and FP2/FP3-4-5
Potential and balance of agronomic and soil fertility research in the RTB portfolio	• Assure proper integration and visibility of agronomic aspects in FP3 and across delivery FPs
Strategic management of partnerships for scaling innovations	• Assess existing experiences and best practices within and beyond RTB and CGIAR; • orient the selection/development of appropriate management approaches and tools
FP5: Integration of agri-food and livelihood systems research into RTB portfolio	• Review and document changes in research agenda, research management, product delivery and outcome achievement; • Identify and assess synergies created across FPs/CRPs and crops; • Analyze ongoing experiences in order to identify and characterize success factors and challenges

3) Impact assessment

The impact assessment module will play a key role in supporting the definition and regular revision of research priorities, in orienting strategic program planning and resource allocation, in fostering better customization of products and technologies for enhanced adoption, and in demonstrating the impact of RTB research.

There is increasing recognition that interventions that contribute to complex, indirect causal chains, with multiple partnerships, and with data limitations require a broad range of methods to evaluate effectively, especially at the impact level. Therefore, the CRP will adopt a mixed methods approach to evaluation its performance, including ex-ante and ex-post impact assessments.

For the assessment of research priorities, a comprehensive exercise for all RTB crops and technologies, as the one conducted in 2014, is envisioned for every 5 to 7 years as decision-making support tool. Foresight analysis will also be conducted in collaboration with the Global Futures and Strategic Foresight (GFSF) Project of the Policies, Institutes and Markets (PIM) CRP, using the IMPACT modeling framework.

Systematic review of FAO data and available literature will be used in order to identify critical factors, including policies and underlying RTB genetic resource base, influencing trends in RTB production, consumption and trade.

A central element of the strategy will be the reinforcement of RTB and key partners' capacities to understand and assess technology adoption and adaptation. A combination of synergistic approaches based on systematic collection and sharing of data is being developed for that. In addition to a strong integration between monitoring and impact assessment and the coordinated definition of variables to be

monitored (see monitoring section), RTB will pursue the fruitful collaboration with Standing Panel on Impact Assessment (SPIA)-led projects, in particular with the Strengthening Impact Assessment in CGIAR (SIAC) Project. At the same time, funding sources other than W1&2 will be mobilized (e.g. BMGF for the development of a database of RTB varietal adoption and the use of DNA-fingerprinting techniques in adoption studies for cassava varieties) and collaboration with other partners promoted (e.g. use of World Bank's LSMS survey for collecting adoption data in Ethiopia and Malawi).

4) Learning

RTB will promote and share its results-oriented culture within and beyond its organizational borders. In particular, RTB will implement a variety of measures to use MELIA findings and information to support learning processes both internally and including partners and stakeholders. These measures includes:

- Regular revision and decision-making processes based on evidences and findings provided by monitoring, evaluation and impact assessments during the meetings with the Independent Steering Committee, management committee and in the RTB annual meeting;
- Integrated analysis of technical and financial data to inform decision making processes and improve their effectiveness;
- Annual reflection sessions organized by flagship project leaders and cluster leaders, each one at his/her level, and including key stakeholders in order to revise the results achieved (both using qualitative and quantitative findings) and agree on the adjustments needed in their ToC and operational plans;
- Improvement of knowledge management and sharing through the IT platform (see section above) and with strengthened coordination with centers' communication and knowledge management units;
- Documenting lessons learned and best practices and facilitate learning across teams/crops/clusters through cross-cutting clusters;
- Improving an internal mechanism for incentivizing good performances in line with the one that would be adopted by the CGIAR System Office to assess the CRP performances.

3. Budget Allocation to MELIA

Resources required to implement a robust and credible MELIA strategy have been included accordingly in the CRP's budget.

For all the elements of the strategy, a budget of 4% of CRP budget has been allocated across all windows. This allocation would cover:

- development and implementation of a stronger monitoring and reporting interoperable platform (mostly W1&2);
- management of data collection measures in various geographies to implement the monitoring plan effectively (W1&2 + Bilateral and W3 funding);
- annual conduct of a CCEE, which is estimated at USD 300,000 of consulting fees per evaluation (mostly W1&2);
- MEL specialists to provide MEL expertise to CRP and project leads, build capacity across the lead centers and partners, and coordinate the implementation of the MEL modules (W1&2).

The impact assessment module will be funded through CC5.1 in FP5 (all funding windows).

ANNEX 6: RTB Linkages with other CRPs and site integration

CONTENT:

Template 1: Overview of Inter-CRP Collaboration: Provide and Receive

Template 2a: Partnerships with other CRPs (activities, mode, geographies and outcomes sought)

Template 2b: Plans for site integration in CGIAR target countries

TEMPLATE 1: OVERVIEW OF INTER-CRP COLLABORATION: PROVIDE AND RECEIVE

Table 1: RTB collaboration matrix with Global Integrating CRPs

Partner CRP	RTB-FP1: Enhanced genetic resources	RTB-FP2: Productive varieties & quality seed	RTB-FP3: Resilient crops	RTB-FP4: Nutritious food & added value	RTB-FP5: Improved livelihoods at scale
POLICIES, INSTITUTIONS AND MARKETS (PIM)	RTB receives: Guidance on market trends and future needs	RTB provides: - Descriptions of seed systems and policy needs RTB receives: - Guidance in seed policy advocacy (with FP5)	--	RTB provides: - Insights into opportunities for reducing postharvest losses and improve utilization of waste across RTB value chains through postharvest innovations - Data and lessons from diversifying markets for RTB crops RTB receives: - Post-harvest losses framework and metrics - Methodological guidance for assessing the potential of value chain interventions focusing on women and the youth	RTB provides: - Foresight data and analysis related to RTB commodities - Ex-ante assessments for RTB interventions and investments - Scaling innovations - Impact of RTB seed system interventions which entail policy support RTB receives: - Training on foresight analysis - Global prospective on foresight modelling - Value chain tools, methods and assessments
AGRICULTURE FOR NUTRITION	--	RTB provides: Breeding/germplasm development to provide nutrient dense varieties	--	RTB provides: Insights from nutrition-focused RTB value chain development, food processing, food industry,	RTB provides: Projections & trends in technology impacts,

Partner CRP	RTB-FP1: Enhanced genetic resources	RTB-FP2: Productive varieties & quality seed	RTB-FP3: Resilient crops	RTB-FP4: Nutritious food & added value	RTB-FP5: Improved livelihoods at scale
		• Delivery in target value chains and Evidence/ Advocacy • Value chain coordination, food processing, food industry RTB receives • Nutritional efficacy and bioavailability studies • Assessing RTB value chains for nutrition and health		and assessing nutrition and health outcomes • Data and lessons from nutrition-focused behavior change interventions and policy advocacy • Joint impact studies of biofortified cassava and sweetpotato RTB receives: • Methodologies for food systems analysis for healthier diets • Insight on nutrition and health outcomes when RTB are combined with other nutrient-rich foods • Assessing RTB value chains for nutrition and health outcomes • Framework for assessing the impacts of biofortification	production, consumption, and utilization of RTB crops RTB receives: • Insight on role of RTB as part of whole diet approaches • Guidance on regional and population nutritional needs
CCAFS	RTB provides • Climate-smart breeding tools and methods RTB receives: • Climate modelling to forecast future impacts on biotic and abiotic factors affecting RTB	RTB provides • Climate-Smart Breeding • Climate Smart Seed systems RTB receives: • Climate modelling to forecast future impacts on biotic and abiotic factors affecting RTB crop production	RTB provides: • Climate-Smart farming RTB receives: • Climate modelling to forecast future impacts on biotic and abiotic factors affecting RTB crop production	RTB provides: • Climate-Smart postharvest practices • Data on postharvest losses and GHG footprint of RTB value chains RTB receives: • Climate modelling to forecast future impacts on postharvest conditions • Methodologies for assessing GHG footprint of RTB value	RTB provides: • RTB Climate-Smart intensification practices • RTB diversification options for improved resilience of tree- crop and cereal-dominated farming systems RTB receives: • Climate suitability maps • Model insights in climate change vulnerability

Partner CRP	RTB-FP1: Enhanced genetic resources	RTB-FP2: Productive varieties & quality seed	RTB-FP3: Resilient crops	RTB-FP4: Nutritious food & added value	RTB-FP5: Improved livelihoods at scale
	crop production			chains, including postharvest losses and waste	(environment x crop x livelihood) • Linkages with Climate Smart Villages
WLE	--		--	RTB provides: - Quantitative assessments of cassava and other RTB waste and its environmental and water footprint RTB receives: - Research data and business models for resource recovery from cassava and other RTB waste.	RTB provides: - best practices and cost-benefit information for RTB production for integration into design of integrated landscape interventions RTB receives: - soil and plant nutrient analytical methods, digital mapping of soil constraints, and risk-based landscape-wide approaches to predictive agronomy

Table 2: RTB collaboration matrix with AFS CRPs

	CRP: Roots, Tubers and Bananas (RTB)				
Partner CRP	FP1: Enhanced genetic resources	FP2: Productive varieties & quality seed	FP3: Resilient crops	FP4: Nutritious food & added value	FP 5: Improved livelihoods at scale
INTER AFS COLLABORATION	RTB receives: See Genetic Gains Platform	RTB receives and provides: - Varieties suitable for system integration e.g. intercropping, relay cropping and rotation systems, dual purpose (food/fodder) - See Genetic Gains Platform	RTB receives and provides: Varieties suitable for system integration e.g. intercropping, relay cropping and rotation systems, dual purpose (food/fodder)	RTB provides: - Methods and models for scaling up nutritious RTB foods that can be extended to include other crops and animal source foods - Data, technologies, and management guidelines for reducing postharvest losses and improve waste utilization that can be adapted to other crops and animal source foods RTB receives: - Insights on reducing postharvest losses and developing nutrition-focused value chains from other crops and animal source foods	RTB provides: - Sustainable intensification of RTB cropping systems with improved synergies with other crop and livestock enterprises for more resilient livelihoods - Insights in crop intensification drivers, farm typologies and targeting technology options - Scaling of innovation options that strengthen technology uptake, particularly for women/youth - M&EL approaches and lessons RTB receives: - Insights on sustainable intensification in relation to crops other than or intercropped with RTB
FISH				RTB provides: Data, lessons, and joint research opportunities for developing RTB and fish value chains to meet nutrition needs, including	RTB provides: - Options for crop-livestock-fish integrations - Options for fish to fill key gaps in ‘whole-diet’ approaches to tackle malnutrition.

	CRP: Roots, Tubers and Bananas (RTB)				
Partner CRP	FP1: Enhanced genetic resources	FP2: Productive varieties & quality seed	FP3: Resilient crops	FP4: Nutritious food & added value	FP 5: Improved livelihoods at scale
				novel products combining biofortified RTB and fish RTB receives: • Data and lessons from promoting fish for nutrition that can be adapted to and/or combined with nutritious RTB foods • Information on feed quality of aqua feed and feed ingredients. NIRS equations for phenotyping	RTB receives: • Options for integrating with fish production and value chains • Opportunities for youth to engage in enterprises
LIVESTOCK		RTB provides: • Cultivars for phenotypic testing. Data on genomics, genetics of traits and management • Access to seed distribution systems RTB receives: • Information on feed supply and demand scenarios; data on nutritive value of crop residues of different varieties/cultivars and promising feed and fodder value chains		RTB provides: • Technologies and market linkages for improving use of RTB, including waste, as animal feed RTB receives: • Data and lessons from utilization of RTB as animal feed • Information on projected demand for RTB as ingredient in animal feed	RTB provides: • Access to research sites in RTB areas to assess integrated approaches to livelihoods improvement • Trade off analysis and options for intensification of RTB crop-livestock systems RTB receives: • Livestock options and feed requirements that guide technological and institutional arrangements for livelihoods improvement

	CRP: Roots, Tubers and Bananas (RTB)				
Partner CRP	FP1: Enhanced genetic resources	FP2: Productive varieties & quality seed	FP3: Resilient crops	FP4: Nutritious food & added value	FP 5: Improved livelihoods at scale
FTA		RTB provides: • Rotation and inter-crop/ companion crops. • Access to seed distribution systems RTB receives: • Information on RTB integration in agro-forestry systems			RTB provides: • RTB-based livelihoods analysis • Diversification options in cocoa-coffee systems. • Options for improved access to and control of RTB enterprises in coffee-cocoa cash systems. • Intensification options for farmers in forest margins to reduce deforestation rate. • Banana/Plantain intercropping in coffee/cocoa systems. RTB receives: • Forest and tree crop-based livelihoods analysis • Reducing impacts on forests and optimizing production in agro-forestry systems • Foresight analysis
DCL/MAIZE/ RICE/WHEAT		RTB provides & RTB receives: • Rotation and inter-crop/ companion crops.			RTB provides & RTB receives: • Rotation and inter-crop/ companion crops • Livelihood analysis tools. • RTB-legume mixtures for dietary diversity

Table 3: RTB collaboration matrix with Platforms

Partner Platform	CRP: Roots, Tubers and Bananas (RTB)				
	FP1: Enhanced genetic resources	FP2: Productive varieties & quality seed	FP3: Resilient crops	FP4: Nutritious food & added value	FP 5: Improved livelihoods at scale
Genebank Platform	RTB provides: - Value enhancement of germplasm collections - Mining biodiversity for trait discovery - Pre-breeding materials - Data on use and availability of genetic resources under different policy regimes - Baseline monitoring of in situ genetic diversity RTB receives: - Access to genetic diversity - Database & information management - Association of trait data to accessions - Select germplasm subsets to facilitate screening germplasm - Enhanced user-interactive database for targeting accessions - Enhanced policy clarity for use and exchange of genetic resources	RTB provides: - Released varieties with value to end users - Enhanced use of genebank material - Feedback on user preferred traits - Information on demanded traits RTB receives: - Conservation method of non-released RTB-bred material - Curated conservation of RTB released varieties - Distribution into the future of RTB-released varieties through an online database - Access to genetic diversity - Database & information management	RTB provides: - Enhanced use and impact value to genebank material - Enhanced understanding of traits for biotic and abiotic challenges RTB receives: - Diversity for capturing alleles for biotic and abiotic resistances and tolerances - Curated conservation of RTB released varieties - Distribution of RTB-released varieties through an online database	RTB provides: - Enhanced use and impact value to genebank material - Enhanced understanding of nutritionally important traits - Tools for screening nutritionally important components in genebank accessions RTB receives: - Enhanced use and impact value to genebank material - Enhanced association of nutritionally important attributes in genebank accessions	RTB provides: - Impact assessments of the value of genetic diversity and genebanks - Enhanced understanding of gender and youth components of germplasm use and conservation - Pathway for better integration of national entities in genetic resources conservation RTB receives: - Enriched understanding of the contribution of genetic resources in the impact pathway - Policy guidance in germplasm flow and exchange - Enhanced options and new germplasm through better integration of the genebanks in national genetic resources conservation

	CRP: Roots, Tubers and Bananas (RTB)				
Partner Platform	FP1: Enhanced genetic resources	FP2: Productive varieties & quality seed	FP3: Resilient crops	FP4: Nutritious food & added value	FP 5: Improved livelihoods at scale
	Link to understanding on farm diversity to help target conservation efforts				
Genetic Gains Platform	RTB provides: - CapDev needs - Approaches and metrics for assessing genetic gain - User feedback on GGP tool - Information about, or code for bioinformatics tools for genotyping - Bioinformatic tools to share - Approaches/cases for phenotyping - Databases at related to target germplasm RTB receives: - Virtual & face-to-face CapDev - Practical toolbox to support breeding excellence. - Standardized approaches for assessing genetic gain - Documented use cases and best practices for genotyping and phenotyping - Procurement and coordination of common genotyping/sequencing services and high-throughput	RTB provides: - Feedback on GGP tool use and usefulness in enhancing breeding activities and progress RTB receives: - Generic tools and services to support breeding program excellence and accelerated learning - Procurement and coordination of cutting edge and high-throughput precision phenotyping and technical support for applying in breeding programs			

	CRP: Roots, Tubers and Bananas (RTB)				
Partner Platform	FP1: Enhanced genetic resources	FP2: Productive varieties & quality seed	FP3: Resilient crops	FP4: Nutritious food & added value	FP 5: Improved livelihoods at scale
	precision phenotyping and technical support Bioinformatics and data management tools & services, including interconnectivity and interoperability				
Big Data platform	RTB provides: - Open access to genotyping data - Open access to in situ databases RTB receives: - Data management and analytical tools - Data collection tools, e.g. crowd-sourcing and data mining	RTB provides: - Open access to genotyping, phenotyping and germplasm evaluation and selection data - Open access to RTB seed system information databases RTB receives: - Data management and analytical tools - Data collection tools, e.g. crowd-sourcing and data mining			RTB provides: - Data collected (HH data, crop response data, environmental data) - Data analysis (HH typologies, drivers of adoption, technology targeting) - Data collection tools RTB receives: - Aggregated data collected - Big data analysis tools - Citizen science tools (incl. phone apps)
Gender platform	RTB provides: - Gender-differentiated target traits for RTB crops across the breeding pipeline. RTB receives: - Norms and Agency analysis and guidance by geography - Foresight on policy, education and norms	RTB provides: Characterization of gender-differentiated preferences for traits and their consequences to help breeding strategies and ensure gender inclusive access to better seed. RTB receives:	RTB provides: - Baseline studies on gender roles in RTB-based cropping systems and household typologies. - Gender and youth local knowledge on disease	RTB provides: Gender differences in RTB trait preferences by consumers, food processors, and household level food preparers and caregivers	RTB provides: - Gender-specific needs of end users and how RTB innovations are adapted for intensification, diversification and dietary improvement to end users' needs - Understanding of how global and local trends affect

	CRP: Roots, Tubers and Bananas (RTB)				
Partner Platform	FP1: Enhanced genetic resources	FP2: Productive varieties & quality seed	FP3: Resilient crops	FP4: Nutritious food & added value	FP 5: Improved livelihoods at scale
	affecting gender and youth on technology access and acceptance	• Norms and Agency analysis and guidance by geography • Foresight on policy, education and norms affecting gender and technology access and acceptance	management to develop information and communications strategies on safe pest and disease control methods RTB receives: • Foresight on policy, education and norms affecting gender and technology access and acceptance	• Feedbacks on gender responsive value chain tools, methods and communication materials for gender equitable outcomes RTB receives: • Synthesized knowledge and sharing on how gender inequalities affect agri-food systems	gender relations and gender equity RTB receives: • Support for integrating gender to create strategic partnerships with national, regional and global organizations for policy advocacy and influencing for women's empowerment issues related to the cases of RTB innovations

TEMPLATE 2A: PARTNERSHIPS WITH OTHER CRPS (ACTIVITIES, MODE, GEOGRAPHIES AND OUTCOMES SOUGHT)**Table 1: RTB collaboration matrix with Global Integrating CRPs**

Partner CRP	ACTIVITY	RTB ROLE (AND FLAGSHIP)	COLLABORATING CRP ROLE	COLLABORATION MODE	OUTPUT; ADDED VALUE; TARGET COUNTRIES
POLICIES INSTITUTIONS AND MARKETS)	Foresight	Contribute with crop models (FP5)	Use the International Model for Policy Analysis of Agricultural Commodities and Trade (IMPACT) model to generate mid- and long-term projections of supply and demand of RTB crops	Leadership by PIM; cost sharing Joint (ongoing) Complementary (Ongoing) Joint (to be explored)	Improved alignment of RTB investment with market opportunities Global
	Ex-ante assessment	Run ex-ante impact assessment models for promising RTB technologies based on rates of return (FP5)	Use the IMPACT model to enhance ex-ante impact assessment of RTB technologies in a holistic model, including multiple commodities (Future Harvest+)	Joint (ongoing)	More robust ex-ante assessment, with information on indicators of economic welfare and food security in more continuous manner; Global
	Scaling innovations	Generation of household, scaling and other typologies (FP5) to improve RTB scaling strategies in FP2-FP4	- Complementary analysis and development of a typology of value chain-focused scaling models and mechanisms, investment schemes and a framework for assessing scaling outcomes and identifying best bet options - Knowledge sharing and scaling through value chain hubs, across commodities, CRPs and partners	Joint (to be explored)	Framework for learning across multiple value chains and improving scaling strategy; Global
	Value chain tools, methods and assessments	- Share lessons with others through PIM value chains platform - Action learning on tool development in specific contexts to strengthen the design, implementation and assessment of interventions aimed at inclusive and efficient value	- Leads and coordinates learning around the development of approaches, methodologies and tools for value chain development and scaling (FP3) - Developing and validating innovative mechanisms to promote	Joint (ongoing)	- Improved tools and methods and accelerated learning. - Synergies across multiple value chains, connect research to key policy decisions and deliver large

Partner CRP	ACTIVITY	RTB ROLE (AND FLAGSHIP)	COLLABORATING CRP ROLE	COLLABORATION MODE	OUTPUT; ADDED VALUE; TARGET COUNTRIES
		chains Develop the concept of coaching in gender and value chains (FP2, FP4, FP5)	co-investment of public and private actors in innovation in different crop value chains (FP3) Expanding the use of gender-responsive versions of Participatory Market Chain Analysis (PMCA), 5Capitals, LINK and other value chain methods, and advocacy work in relation to the findings generated by these (FP3)		development outcomes as measured against the SRF framework Around the emerging Value Chain hubs in South America and West and East Africa
	Post-harvest losses framework	Apply framework to evaluate losses and improve post-harvest management (FP4)	Develop framework to evaluate the extent and sources of post-harvest losses/methodology to measure postharvest losses along different stages of the value chain that can be replicated across regions and crops/ differentiating losses in terms of quantity, quality and value (FP3)	Joint (ongoing)	Consistent method for measuring post-harvest losses and guiding research investment to area of highest pay-off; Uganda and Peru
	Seed system analysis	Identify seed system interventions and seed markets where policy has critical influence (FP2, FP5)	Assessing appropriate and effective roles for in varietal development and the production and distribution of seed and planting materials (FP2, FP5)	Joint core and W3 funded	Enhance viability of seed systems through more appropriate engagement of public, private, and community actors; Nigeria
	Gender analysis	- Apply, adapt and improve guidelines for sex disaggregation of data in baseline and other surveys (FP5) - Research, capacity building, and south-south knowledge-sharing on gender sensitive value chain development (FP5)	- Developing guidelines and tools for collecting sex-disaggregated data at household, SME and overall value chain level and integrate feedback from RTB (FP3) - Research, capacity building, and south-south knowledge-sharing on gender sensitive value chain development (FP3)	Joint (ongoing)	Improved uniformity and quality of sex-disaggregated data across CRPs; Global

Partner CRP	ACTIVITY	RTB ROLE (AND FLAGSHIP)	COLLABORATING CRP ROLE	COLLABORATION MODE	OUTPUT; ADDED VALUE; TARGET COUNTRIES
	Geospatial mapping	Geospatial mapping with RTBMaps (FP5)	Collaboration through the CGIAR-wide geospatial working group for common ontology and interoperability of databases	Ongoing	Cost saving and access to big data; Global
AGRICULTURE FOR NUTRITION AND HEALTH (A4NH)	Breeding/germplasm development	- Leads overall breeding program of biofortified crops - Supports and uses high-throughput diagnostics for vitamin levels and other quality traits (FP2)	Leads high-throughput diagnostics (NIRS platform) for vitamin levels and other quality traits (minerals, sugars, dry matter, etc.)	Alignment of W3 projects	Ensure that nutritional traits embedded in varieties with good agronomic and consumer-preferred traits; Global
	Nutritional efficacy and bioavailability studies	User of information in breeding programs (FP2)	Primary responsibility for studies		Ensure nutritional efficacy in released varieties; Global
	Delivery in target value chains and Evidence/Advocacy	Leads on key agriculture value chain delivery and contributes to cost effectiveness studies (FP2, FP4)	Leads on the nutrition evidence and public delivery related to improving nutrition and health in target populations		Advocacy for nutrition friendly value chains; Global
	Value chain coordination, food processing, food industry, and assessing nutrition and health outcomes	- Leads facilitation with key value chains, with a particular focus on gender relations as RTB commercialization increases - Joint work on processing and foods (FP2, FP4)	- Study incentives and arrangements as they relate to consumption and improving nutritional quality (including gender), standards for biofortified products, and food safety - Joint work on processing and foods. - Policies affecting value chains, economics of value chain transformation (e.g., scaling up to supermarkets, etc.) (with PIM)		Broad based coalition for improving nutrition responsive value chain coordination; Global

Partner CRP	ACTIVITY	RTB ROLE (AND FLAGSHIP)	COLLABORATING CRP ROLE	COLLABORATION MODE	OUTPUT; ADDED VALUE; TARGET COUNTRIES
	Assessing RTB value chains for nutrition and health	Shares in implementation of assessment methods, contributing a crop-specific and place based perspective (FP2, FP4, FP5)	• Contribute with tools and methods for assessments of nutritional quality, food safety, and health benefits • Contribute with tools and methods for value chain assessment (with PIM)		Program evaluation capacity of A4NH helps RTB learn from the implementation and scaling processes to strengthen impact; Global
CCAFS	Climate-Smart Breeding	Utilize foresight, metrics and models to improve selection and definition of traits (FP1,FP2)	Develop Foresight, metrics and models for climate-smart breeding with (CCAFS F1);	Joint (planned)	Co-invest to develop climate sensitive breeding strategies, especially trait prioritization (CCAFS models & metrics); Global
	Climate modelling to forecast future impacts on biotic and abiotic factors affecting RTB crop production	Incorporate effects of climate change in insect crop life cycle modelling, and disease models (e.g. Blightcast); (FP2, FP3)	Joint research on modelling climate change effects on pests and diseases and on adaptation in the applied Climate Smart Village approaches (CCAFS F2)	Joint (ongoing in Climate Smart Villages in Tanzania, Uganda; planned in other locations pending funding); Modelling planned, pending funding)	Improved understanding of climate change impacts on pests and diseases and success of control measures; East Africa
	Climate-Smart farming	Incorporation of climate change in research on resilience in cropping systems across climate gradients (FP2, FP3, FP5)	• Shared intervention sites, technology transfer, shared farm system diagnostics and needs assessments; shared M&EL systems; (CCAFS F2) • Improving the resilience of maize-based farming systems through RTB diversification (CCAFS F2) • Links to global platform on loss and waste in relation to climate change (CCAFS F3).	Joint (ongoing); for loss and waste – joint (planned)	• Mutual technology validation from a systems and/or resilience research perspective. • Co-location of scientists; Joint investments in tools development, partnering, and scaling. Climate Smart Villages, Vietnam, SSA

Partner CRP	ACTIVITY	RTB ROLE (AND FLAGSHIP)	COLLABORATING CRP ROLE	COLLABORATION MODE	OUTPUT; ADDED VALUE; TARGET COUNTRIES
	Foresight on climate change	Includes climate change in ex ante impact assessment (FP5)	Modelling, horizon scanning and foresight analysis, policy analysis (CCAFS F1)	Joint (planned)	Enhanced foresight considering climate change in RTB
WLE	Landscape restoration (Development of predictive agronomy approaches at landscape/national level based on spectral diagnostic and digital soil mapping methods for nutrient management of cassava in sub-Saharan Africa)	RTB are conducting multilocal trials on cassava agronomy and will conduct soil and plant sampling., SE Asia (FP3, FP5)	Scientific and technical advisory services and analytical services in use of low cost, high throughput soil and plant spectral analytical methods and available digital mapping products for developing evidence-based approaches to predicting agronomic responses to nutrient inputs considering landscape variability.	Advisory services, soil-plant analytical services, joint data analysis	Development of generalizable predictive relationships on response on cassava to soil variability and nutrient inputs contributing to integration of agronomic practices into landscape context; Countries in Africa to be decided upon South East Asia Vietnam, Thailand
	Co development of business models on wastewater utilization linked to cassava processing, and for integration into improvement of ecosystem services	Adapt and validate technology for waste and water management with small scale processors (FP4)	Ecosystem level approaches for managing processing waste and water (with Livestock)		More efficient processing and utilization of waste from small scale cassava processing; Nigeria

Table 2: RTB collaboration matrix with AFS CRPs

Partner CRP	ACTIVITY	RTB ROLE (AND FLAGSHIP)	COLLABORATING CRP ROLE	COLLABORATION MODE	OUTPUT; ADDED VALUE; TARGET COUNTRIES
INTER AFS COLLABORATION		User and contributor to shared platforms (FP1, FP2)			
	Sustainable intensification incl systems research, e.g. livelihoods	• Use multi crop frameworks to guide research around e.g. residue use in a whole farm context and multipurpose SP as food, feed and cover crop to reduce soil erosion • Modeling diversified farming systems. Joint analysis of crop integration. Joint design of land and soil management (FP5)	Shared frameworks and approaches for full (multi) purpose crops: e.g. improving fodder resources from crop residues		Improved integration of innovation processes in multi crop context, and assessments of resilience through scenario simulation; Global
	Genetics linked Cap Dev	Utilize as basis for CapDev, coordination with Breeding Platform (FP1, FP2)	BECA as genetics-related training hub for all AFS-CRPs for		Improved critical mass, reduction in costs; Global
	M&EL	Member of community of practice user of shared/interoperable M&EL platform (FP5)	• Joint M&EL framework, methods and tools (e.g. e-household), interoperability of platforms (ongoing preparations 2014-16), ideally common platform • Platform: Metrics for breeding cycle, e.g. how to monitor progress on		Faster, more precise, genetic gain, more structured variety and trait pipelines; Global
	Targeting & prioritizing	Active participant, link to RTB maps (FP5)	Renew GIS Community of Practice		Shared framework for analysis/ setting priorities; Global
	Multifunctional landscapes	Integrating RTB crops into aquatic production systems (FP5)	Multifunctional landscapes, with more resilient and ecologically sustainable RTB and aquatic production systems		Improved resilience of RTB production systems; Bangladesh, Cambodia, Zambia,
FISH					

Partner CRP	ACTIVITY	RTB ROLE (AND FLAGSHIP)	COLLABORATING CRP ROLE	COLLABORATION MODE	OUTPUT; ADDED VALUE; TARGET COUNTRIES
	Improving use of RTB crops for feed	Provide cassava waste processed in different ways	Test the bioconversion efficiency of different forms of cassava waste (including variations in pre-processing the waste) and the bioactive effects on the growth of crustaceans (prawns and crabs) and fish (tilapia and catfish)	Joint, FISH from bilateral, IITA bilateral with Enable Youth Training Center	Tanzania
	Ecosystem services and improved nutrition	Incorporate aquatic production as dimension of trade-offs analysis in livelihoods (FP5)	Ecosystem service trade-offs and synergies (e.g. nutrition) due to expansion of RTB or aquatic production systems		Improved alignment of research with full range of livelihood options; Zambia, Bangladesh
	Foresight work	Shared work on foresight linked to site integration (FP5)	Methods and tools for foresight work in relation to climate change and other drivers of change		Foresight work considers whole livelihood context; Bangladesh
LIVE-STOCK	Improving use of RTB crops for feed	Selection of sweetpotato varieties suited to feed and validation of options for utilizing cassava peel and other waste from RTB crop production and processing for feed (FP4, FP5)	A cross-CRP platform linking the Livestock CRP with several of the other agri-food systems CRPs will be established aimed at improving fodder resources from crop residues. This work will be guided by the Livestock CRP but embedded in the trait discovery and crop breeding flagships of Maize, Wheat Rice, RTB, DCLAFS using the “full purpose crop” concept that concomitantly, improves food, feed and fodder traits of crops with no additional land and water need.	Ongoing, joint funding all windows, expand with systems innovation fund	Expanded utilization of RTB crops and their residues for feed; Uganda, Nigeria

Partner CRP	ACTIVITY	RTB ROLE (AND FLAGSHIP)	COLLABORATING CRP ROLE	COLLABORATION MODE	OUTPUT; ADDED VALUE; TARGET COUNTRIES
FTA	Reducing impacts on forests and optimizing production in agro-forestry system	- Intensifying RTB to reduce environmental impact (FP3) - Banana cultivars and their management linked to specific agro-forestry systems (FP3, FP5) - Optimizing management of banana production in agro-forestry systems (FP3)	- Framework for managing RTB systems to minimize impacts on forest environments (FP4?) - Optimizing management of banana production in agro-forestry systems (FP2)	Opportunities and linkages firmed up in joint proposal development using systems innovation fund (w1&2) and other resources	Sustainable intensification of RTB systems; West Africa
	Livelihood analysis	Incorporate tree crops in livelihood analysis (FP5)	Livelihood systems analysis on mixed tree-crop and RTB crops (FP2)	Opportunities and linkages firmed up in joint proposal development using systems innovation fund (w1&2) and other resources	Better targeting of research; Global
DCL	Rotation and inter-crop/ companion crops.	- Adapt potato varieties and their management as rotation crop with grain legumes and dryland cereals - Sweetpotato varieties for intercropping and for enhancing the quality of cereal residues as animal feed (FP2, FP4, FP5)	- Grain legumes and dryland cereals varieties and agronomic practices adapted to intercropping - Guide selection of best RTB crops and varieties for rotation	Opportunities and linkages firmed up in joint proposal development using systems innovation fund (w1&2) and other resources	Exchange tools/methods for systems analysis; Asia
MAIZE	Rotation and inter-crop/ companion crops.	- Adapt RTB varieties and their management as rotation crop or inter crop with maize - Sweetpotato varieties for intercropping and for enhancing the quality of cereal residues as animal feed (FP2 and FP5)	- Maize varieties and agronomic practices adapted to intercropping or rotation with RTB crops - Guide selection of best RTB crops and varieties for rotation	Opportunities and linkages firmed up in joint proposal development using systems innovation fund (W1&2) and other resources	Strengthen resilience of maize-based systems with RTB crops; Africa, LAC

Partner CRP	ACTIVITY	RTB ROLE (AND FLAGSHIP)	COLLABORATING CRP ROLE	COLLABORATION MODE	OUTPUT; ADDED VALUE; TARGET COUNTRIES
RICE	Rotation crops/compani on crops.	Adapt RTB varieties and their management as rotation and inter crop with rice including with salinity tolerance (FP2, FP3, FP5)	• Integration potato and sweetpotato in rice based systems including those susceptible to flooding • Guide selection of best RTB crops and varieties for rotation • Seek linkages to work in inland valleys and uplands including joint PhDs on farming systems analyses of trade-offs and complementarities between rice and RTB enterprises under changing climate and population pressure.	Opportunities and linkages firmed up in joint proposal development using systems innovation fund (w1&2) and other resources	Integrated approach to resilient cropping; India, Bangladesh, China; West & East Africa (in particular in Côte d'Ivoire, Nigeria, Tanzania and Uganda for inland valley systems)
	Rotation crops/compani on crops	Adapt potato varieties and their management as rotation crop with wheat (FP2, FP5)	• Wheat varieties and agronomic practices adapted to intercropping • Guide selection of best RTB crops and varieties for rotation	Opportunities and linkages firmed up in joint proposal development using systems innovation fund (w1&2) and other resources	Integration potato in wheat based systems; Asia

Table 3: RTB collaboration matrix with Platforms

Partner Platform	ACTIVITY	RTB ROLE (AND FLAGSHIP)	COLLABORATING PLATFORM ROLE	COLLABORATION MODE	OUTPUT; ADDED VALUE; TARGET COUNTRIES
GENEBANKS	Value enhancement of germplasm collections	Greater efficiency in use of genetic resources collections through facilitated use of accession-based traits for selection of germplasm (FP1, FP2)	Partnering with the genebanks for accession-based association of traits of interest for RTB		Reduced time and resources and greater availability for in use and incorporation of traits of interest from germplasm collections into improved varieties; Global
	Mining biodiversity for trait discovery	Unique, novel and variant forms of important traits are uncovered from germplasm collections (FP1- FP4)	Collaborative research to identify accessions and traits with novel traits important for achieving RTB goals.		Identification of genes/genetic regions that can encode traits of value that can be incorporated into elite varieties; Global
	Pre-breeding	Genebanks will collaborate with RTB to source, evaluate and propagate wild or non-adapted sources for germplasm enhancement and pre-breeding. (FP1)	Combined activities to integrate gene/traits of interest into germplasm that can be readily adopted and used in breeding programs.		Making genes/traits available for breeding programs which would otherwise be too time consuming or difficult to use; Global
	Database & information management	Develop accession-specific trait associations readily searchable in a public database (FP1 - FP4)	Shared breeding and genebank databases through a public portal in such a way that accession can be selected by phenotype or genotype		Silico selection of genebank accessions greatly increasing the efficiency of the selection of genebank materials for breeding programs; Global

Partner Platform	ACTIVITY	RTB ROLE (AND FLAGSHIP)	COLLABORATING PLATFORM ROLE	COLLABORATION MODE	OUTPUT; ADDED VALUE; TARGET COUNTRIES
GENETIC GAIN	Shared genotyping, high-throughput phenotyping, and bioinformatics platforms	User and contributor to shared platforms (FP1, FP2) Share bioinformatics tools developed for clonally propagated crops, adapted for polyploidy and heterozygosity.	Expand Genomic and Open-source Breeding Informatics Initiative (GOBII) Continue to promote use of shared platforms: e.g. Integrated Breeding Platform and CGIAR Big Data Platform	Interact via BCoP and Platform guidelines for access to services	Increased critical mass and use of big data; Global
	Germplasm improvement	- Hub for clonally propagated crops (FP1, FP2) - Share breeding tools developed for clonally propagated crops, adapted for polyploidy and heterozygosity.	Shared phenotyping platforms	Interact via BCoP and Platform guidelines for access to services	Reduction in cost of service provision; Global

TEMPLATE 2B: PLANS FOR SITE INTEGRATION IN CGIAR TARGET COUNTRIES

Target country (++ and + countries relevant to your CRP)	Define steps taken so far (March 2016) to establish national level engagement with other CRPs towards site integration	Define plan and schedule through which your CRP will provide relevant elements for development of CGIAR site integration in this country
++ countries		
Bangladesh Craig Meisner (WorldFish)	In Bangladesh, for over 3 years 7 CGIAR centers representing over 7 CRPs have established a CGIAR Advisory Committee. Through this venue all CGIAR centers plus AVRDC and IFDC meet with our NARS and Ministry officials twice a year. We have met twice in 2015 and will meet 2 times in 2016. All details for this integration as well as 4 CAC minutes are posted on the http://gcard3.cgiar.org/national-consultations/bangladesh/	A CIP representative attended the formal meeting and a bilateral meeting was organized with Worldfish leader in Bangladesh. RTB, through the CIP staff have maintained regular contact with other Centers/CRPs in Bangladesh for coordination purposes and related to research collaboration. The most recent organized by CIP in September 2015 at which IRRI, Worldfish and CIMMYT participated to discuss future collaboration, especially the potential for expanding the role of potato in cereal-based systems. This was followed up by CIP's organization of an international workshop on potato agriculture in February 2016, at which IRRI and CIMMYT staff were represented. The workshop held in February focused on sustainable intensification and diversification of cereal-based systems and it set the groundwork for cross-CRP collaboration. Overlap of sites in target districts of southern Bangladesh (Kulna, Barisal, Patuakali, Faridpur) due to joint funding by USAID Feed the Future. Current preparation of a one year USAID interim grant also focuses in these overlapping locations. Strong collaboration by RTB with BRAC, an international NGO based in Bangladesh for implementation of potato and sweetpotato projects. They also provide a common NGO platform through which RTB also collaborates with AAS and Worldfish and other organizations operating in Bangladesh. Even before the Consortium-driven integration process, RTB through CIP has been a member of a CGIAR coordination group linked to their common implementation of Feed the Future projects. Outside of meetings convened through USAID, RTB has also participated in multi-lateral coordination meetings led by the biggest CGIAR Centers (Worldfish and IRRI). CIP has worked with Worldfish to expand the area of the OFSP and vegetables to integrated homestead systems involving fish ponds.

Target country (++ and + countries relevant to your CRP)	Define steps taken so far (March 2016) to establish national level engagement with other CRPs towards site integration	Define plan and schedule through which your CRP will provide relevant elements for development of CGIAR site integration in this country
		Currently CIP is the only RTB Center operating in Bangladesh. We are coordinating with CIAT about possibilities of expanding work on potato and SP to cassava, which is a small but potentially growing part of the agri-food systems. Within CIP, the Country Manager has been in close coordination with both CIP's Regional Director and the Leader of Social and health sciences in relation to actions and partnerships. More recently CIP's leaders of SO1 and SO2 Programs have taken a stronger role in coordinating strategy and future actions.
Ethiopia Siboniso Moyo (ILRI)	The Ethiopia CGIAR country collaboration and site integration process is coordinated by a committee representing 11 CGIAR Centers (Bioversity, CIAT, CIFOR, CIMMYT, CIP, ICARDA, ICRAF, ICRISAT, IFPRI, ILRI and IWMI) that are based in Ethiopia plus 3 others (Africa Rice, IITA and IRRI) who have no offices in the country, 10 CRP focal points, (Climate Change, DCLAFS, Forest and Agro Forests, Livestock, Maize, Nutrition and Health, PIM, Rice, Roots Tubers & Bananas and WLS&E) and the Genebank platform. This is the larger group that receives all communications on this process and meets quarterly for those who are based here to coincide with the existing Heads of Institutes meetings. This committee also helps with data collection (eg. mapping of ongoing projects in Ethiopia and baselining on the 10 principles of site integration). Out of this we formed a smaller group of six (3 Centers and 3 CRPs) which meets more often to plan for meetings and the process in more detail with the help of ILRI Communications and Knowledge Management team which facilitates and helps capture the notes of meetings. We are in the process of activating a wiki for our communications. At strategic points of the planning process we have brought in the Agricultural Transformation Agency and the Ethiopian Institute of Agricultural Research to help us better prepare for the national consultation process.	As part of presentation CG centers presented their activities and relevant CRPs in the marketplace. CIP presented its ongoing activities and RTB through posters. While root and tuber research activities are well coordinated by the national research system via national commodity projects, root and tuber related research and development including emergency activities are poorly coordinated and often inadequately technically backstopped in the country. There are few initiatives which are trying to coordinate both research and development works which includes Potato Coalition and Potato Platforms. CIP played important role towards formation of potato coalition. The primary objective of potato coalition is to promote roots and tubers through agriculture extension packages. There is also a Roots and Tubers Working Group that aims to strengthen the coordination and harmonization of roots and tubers-related interventions - both development and emergency related interventions - that will result in the adoption of common standards and approaches that will strengthen the root and tuber sub-sector over time and therefore improve the well-being of poor smallholder farmers. Through this initiative it is proposed that Working Group will contribute to both increased production and productivity and therefore result in increased household income and improved food and nutrition security.

Target country (++ and + countries relevant to your CRP)	Define steps taken so far (March 2016) to establish national level engagement with other CRPs towards site integration	Define plan and schedule through which your CRP will provide relevant elements for development of CGIAR site integration in this country
	Some key activities to date include: • Creating a database of our major partners/collaborators • Mapping CGIAR Center and CRP work in Ethiopia (November 2015). Continuing to refine. • Engaging in partners' (ATA, RED&FS) national consultations on alignment to GTP II (November 2015 – January 2016). • Conducting National Consultation Meeting (11 December 2015) • Different CRPs/Flagships are conducting focused group consultations (January-March 2016) • Conduct focused group discussion with a target group of stakeholders (women and youth groups, farmers associations and others as agreed in the December meeting) • Joining the Ethiopian Institute of Agricultural research in celebrating their golden jubilee through a series of seminars, technology exhibition and other high level ceremonies. • Creating a wiki for the coordinating committee On 11 December 2015 we held a national consultation whose main objectives were to: 1. Improve understanding of the national priorities and goals for agricultural and related nutrition and health research for development; 2. Present CGIAR work in Ethiopia (major thematic areas, partnerships and geographic location); and 3. Identify major opportunities to align activities across actors around specific themes, including reviewing modalities for country collaboration. Participants were drawn mainly from the Federal Government Departments, Development partners (Donors, NGOs) and very few private sector and farmer association groups. The meeting participants agreed that the follow on focused meetings by CRPs should aim to include the wider stakeholders groups including women and youth.	The USAID funded Better Potato for a Better Life and IrishAid funded Scaling out sweetpotato and potato led interventions for nutrition and food security are mapped under RTB. But, both projects may contribute to A4NH. However, these projects are ending in December 31, 2016. Further discussion needed among different CRPs. CIP is a part of a large project called Africa Rising (led by ILRI and funded by USAID) which is being implemented through different livelihoods system approach. The livelihoods systems indicate that RTB can be overlapped with Maize and wheat and Climate Change, Agriculture and Food Security CRPs. CIP is implementing projects through Government institutes like Ethiopian Institute of Agricultural Research – EIAR) Regional Research Institutes (ARARI, TARI, SARI) and Regional Bureau of Agriculture (BOAs). These are the main agencies for research, development and technology extension. In addition, there are several partner NGOs (CARE, VITA, GOAL) who are also working with CIP for promoting potato and sweetpotato. SNV, World Vision and FAO are also working with potato and other roots crops In Ethiopia, there are more than 12 universities which are involved in Agriculture research activities. The major ones involved in potato and sweet potato research and development are: Alemaya University, Awassa University, Mekelle University, Bahridar University, Sodo University and Ambo University. Next steps: Resource mobilization for strengthening RTB research and development activities in the country. Extend collaboration with government and non-government agencies for improving potato and sweetpotato/roots and tubers research and development as climate smart agricultural system. There were very brief presentation of CRPs in the national consultation meeting. Further discussion around CRPs will take place in upcoming meetings.

Target country (++ and + countries relevant to your CRP)	Define steps taken so far (March 2016) to establish national level engagement with other CRPs towards site integration	Define plan and schedule through which your CRP will provide relevant elements for development of CGIAR site integration in this country
	The Roadmap for agricultural and economic growth in Ethiopia is spelt out in the Government's vision was launched in during the last quarter of 2015 through the Growth and Transformation Plan II. The CGIAR should continue to align its programs to that. In addition there are already big ongoing programs led by the Government like the Sustainable Land Management (SLM) to which the CGIAR is already a major player. Following the launch of GTP II there have been a lot of national consultation meetings organised by several of CGIAR partners working on the alignment to GTP II. A good example are the meetings organised by the Agricultural Transformation Agency (ATA) and the Rural Economic Development and Food Security Sector Working Group (RED&FS) to discuss different pillars under GTP II. A number of CGIAR Centers participated in these consultations based on subject matter. The months of October-December were a busy time in Ethiopia. The CGIAR national consultation focused on strengthening mechanisms of engagement and seeking ways to better align to national priorities. One of the key recommendations was the need to establish a joint CGIAR-national agriculture research system collaboration and communication mechanism. This mechanism, it was recommended, would establish a permanent secretariat for joint planning, sharing of findings, and monitoring and evaluation. The other areas of collaboration were: the development of joint research proposals, sharing of equipment and resources, streamlining policy engagement, and improving opportunities and modalities of capacity development. The need to facilitate access to laboratory facilities was also highlighted as key. These goals could be achieved through enhanced joint research implementation and supervision. This meeting was fully supported by ILRI and the Livestock and Fish CRP. When contacted most Centers had no budgets to support this meeting. We risked not holding the meeting if the Lead Center had not taken action. This is a gap that the	

Target country (++ and + countries relevant to your CRP)	Define steps taken so far (March 2016) to establish national level engagement with other CRPs towards site integration	Define plan and schedule through which your CRP will provide relevant elements for development of CGIAR site integration in this country
	committee has raised in the previous meetings and asked every Center and CRP to seek further clarification from DDGs, CRP Directors and the CO on the way forward. More details on the Ethiopia national consultations can be found on the GCARD3 website. Next steps: In our last meeting on the 16th of February we reflected on the December meeting and the follow on focused group meetings by individual CRPs. We further tried to clarify amongst ourselves what we understood site integration to mean? We agreed that so far the CRPs' priorities were well aligned with those of the GTP II and ATA's priorities. This is very promising for upcoming collaboration. We plan to purposely use the GTP II language in our engagements with the national processes and/or document through a flyer how CGIAR is contributing to GTP II. Furthermore we are aiming to identify what each CRP is seeing as the current situation and then the future situation in terms of site integration in Ethiopia from the perspective of the 10 elements which were highlighted in the guidelines, and to turn all that information into a narrative that also looks at collaboration initiatives and at ideas for future integration based on pipeline plans and projects. We were planning for a day's meeting for a smaller group to synthesize this material and write the site integration plan. At the time we discussed this we were not sure what is the level of details the CO is expecting for these plans? We also plan to continue the process of refining the mapping of CGIAR work in Ethiopia.	
Nigeria	No information available	Attendance of the first national consultation event, organized by IITA and held in Abuja, Nigeria 16 th /17 th November 2015. At this, represented RTB. This was the first meeting and focused

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		predominantly on interactions with national partners including the Ministry of Agriculture. Work between IITA and ILRI on use of cassava peel for livestock feed is an example of interactions between RTB and Livestock CRP. In the future, the most likely avenue of collaboration maybe between RTB and MAIZE and DCL particularly with regard to systems level research. Most likely areas are the forest/savanna transition zone (around Ibadan) where yam and cassava based systems can be found alongside maize. There is likely to be considerable scope for the involvement of a range of other actors within Nigeria including policymakers, NARS (eg NRCRI) and Universities. An implementation plan has been developed which will involve detailed discussions with stakeholders including research donors and development agencies.
Tanzania Regina Kapinga (IITA)	The Tanzania CGIAR country collaboration and site integration process is coordinated by a CG- Tanzania Site integration process group composed of representatives from: The Ministry of Agriculture , Livestock and Fisheries (3 persons), Private Sector (1) , 7 CGIAR Centres (CIAT, CIP, ICRAF, IITA, IRRI, Africa Rice, and ILRI) that are based in Tanzania plus 4 others (Africa Rice, ICRISAT, CIMMYT, Bioversity International) who have no offices in the country, 9 CRP focal points, (Climate Change, Livestock, Maize, Nutrition and Health, PIM, Rice, Roots Tubers & Bananas, WLS&E) and the Genebank platform. From the national stakeholders' consultation workshop which was held in December 2015, principles of success and major opportunities for integration between and amongst CG centers, CRPs and national partners were identified to be: mutual trust, shared vision, shared rules of engagement, joint planning and clearly defined roles, transparency and accountability, flexibility, equal voice in partnership, comparative advantage and collective responsibility. To ensure alignment with the national agricultural priorities, both	The site integration in Tanzania is being led by IITA. RTB represented during the national consultation meeting. One of the most prominent areas for CG interaction in recent years have been through the Africa RISING project, although this does not have a major RTB component. Africa RISING involves collaboration between 6 CG centers, AVRDC and national partners. The most important outcome of the site integration meeting was for CG centers to learn about what the Tanzania government is doing and vice versa. Tanzania is launching a major new agricultural development initiative – the Agricultural Sector Development Programme Phase II – which will cover all of the priority areas of Tanzania's agricultural development plans. Once this plan has been completed, the CG centers are requested to focus their work only on priorities identified through this. A plan was also proposed to run a workshop that would bring together Tanzania national research centers with the CG centers, in order to share information and bring the respective programs of research closer together. A major new CG initiative, the

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	CG centres and CRPs have to understand the national strategies as elaborated in the Tanzanian Agricultural Sector Development Program (ASDP) Phase II. This implies that both CG centres and/ CRPs, when preparing the proposals that include Tanzania, should ensure to access the ASDPII documents for references so that where possible align the activities with the identified national priorities. IITA therefore as a lead focal centre, in January this year, was invited to participate in a 5-days national ASDPII prioritization workshop whereby we worked closely with the Ministry officials and other key stakeholders to identify key areas of focus by the country. The documents from this exercise, have been shared with all the CG site-integration focal persons to share with their respective directors and teams for consideration when developing the draft proposals. It is expected that before final submissions, some of the NARS reps. will get an opportunity to provide input on the proposals which include Tanzania to ensure alignment. We are also currently striving to jointly develop and implement projects that have multiple commodities and disciplines. An example we plan to emulate is that of AFRICA RISING project which although is led by IITA, it has other implementing centres which include-ICRAF, CIAT, ICRISAT, IITA, ILRI, AVRDC, and CIMMYT respectively. These together with various national R4D partners in the country, are demonstrating a good example of collaboration and integration. AFRICA RISING project, is using a common set of research sites and staff from various centres are participating in the implementation the project. In the pipeline is the new CGIAR-FARA-African Development Bank's Africa-wide initiative on FEEDING AFRICA. This potential project known as Technologies for African Agricultural Transformation (TAAT), will implement the scaling up and out of the proven technologies from the CG-centres to about 20 African countries. Tanzania, is one of the focus countries for TAAT project which again will provide an opportunity for about 13 CG centres to work together and also	Technologies for African Agricultural Transformation (TAAT), will involve Tanzania as a focus country. This will bring together 13 CG centers in addressing a diverse set of R4D targets. Work on all of the RTB crops will be incorporated into this initiative. Site integration work will have a major influence on this, since local partners will drive the prioritization process. There are currently no specific geographical sites that have been identified for CRP collaboration through the site integration process. This will happen at a later stage. Most of the discussion at the site integration meeting focused on the link between the government of Tanzania and CG centres. Further partnerships will be identified once more practical planning begins. The site integration process in Tanzania is being led by Regina Kapinga, and James Legg represented RTB during all meetings and will provide feedback to RTB on how the process is progressing. CG centers have previously worked well together in Tanzania.

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	partner with the governments and other agencies from the selected focus countries. On 11- 15 April, IITA in collaboration with AfDB, will convene in Nigeria, a TAAT awareness regional consultative workshop which will be attended by several CGIAR centres, development partners, sub-regional organizations and several national stakeholders from various countries. Regarding the sharing of the CGIAR facilities, IITA –Tanzania office, already is hosting three CG centres–CIP, IRRI, and ILRI. AGRA although not a CG centre is hosted by IITA. ICRAF and Africa Rice centres are located in the neighbouring areas which also makes it easy for consultation and effective use of the CG facilities. Our site-integration process group will regularly communicate via emails and where possible organize meetings at least once every six months. Co-funding of these meetings will be explored and explored. Plans are also under way, to discuss the possibility of organizing a CG- NARS national awareness workshop aimed at popularizing to the new government, our best-bet technologies for scaling-up and out using the internally-sourced resources. Therefore, the workshop will strategically target the policy & decision makers, private sector and other key players for resource mobilization. The selected technologies for popularization should have been tested and proven for potential to reach and impact millions of beneficiaries in Tanzania.	
Vietnam Dindo Campilan, CIAT	Nine CRPS and 10 Centers have participated in the Vietnam planning for CGIAR country coordination. A national stakeholders' consultation workshop was organized in December 2015, with over 70 participants representing: 1) research institutes and government agencies, 2) universities, 3) NGOs-private sector agencies and associations, 4) international organizations and donors, and 5) CGIAR staff. Stakeholders agreed on an eco-regional framework to facilitate in-country collaboration and site integration. The target regions are: 1) Northwest, 2) Northeast, 3) Red river delta, 4) North central	For the first meeting, there were 8 non-CG stakeholders associated with RTB representing NARI, NGO's and private sector. CRP-RTB was presented by Bioversity, CIP and CIAT scientists. The CG community in Vietnam is already regularly interacting and coordinating. • Interactions between CRP-RTB and CCAFS to shares experiences on cassava crop management in Climate Smart Villages (CSV's). • Interactions between CRP-RTB and L&F on the use of sweetpotato and cassava as animal feed.

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	coast, 5) Central highlands-south central coast and southeast, and 6) Mekong river delta. In addition, integrating CRPs with national and local development plans was considered a key dimension of country collaboration. For each region, the stakeholders identified: 1) development priorities as set by government policymakers/decision-makers, 2) key research gaps which are recommended for the CGIAR to address, and 3) potential partners for specific research and development initiatives. Between December 2015 and March 2016, CRPs/Centers also engaged in bilateral discussions on specific collaboration needs and opportunities. Several CRPs also organized their respective country/regional planning and consultation events. A follow-up meeting by the CGIAR Vietnam team was held on 7 March, with 8 CRPs and 7 Centers represented. The 8 participating CRPs re-confirmed that Vietnam is a target country for CRP2 proposals. As next step, it was also agreed that subnational targeting will be undertaken for higher-resolution site integration plans, i.e. within each agro-ecoregion. A draft agenda for the 10-element site integration report was prepared. The proposed action items are to be shared with CRPs, for them to indicate their suggested priorities as well as intent for co-financing/cost-sharing. The country collaboration/site integration efforts in Vietnam is coordinated through: 1) core team with representatives from CRPs/Centers having physical (office) presence in Vietnam, and 2) working group with representatives from all CRPs/Centers planning to undertake activities in Vietnam for CRP2. CIAT provides overall leadership, with ICRAF as co-lead Center. In each eco-region, a lead Center and supporting CRP/s have also been identified and agreed upon.	• Interactions between CRP-RTB and HT on system's research. • Interactions between CIAT and CIP scientists concerning methods for impact assessment. • Planning and collaboration between CIP and CIAT in the FoodStart+ project (IFAD / EU funded), involving sweetpotato and cassava. • Regular science seminars between all Vietnam-based CG centers during so-called "brown bag seminars". • Shared office facilities between CG and CRP's in basically two hubs (recently ILRI moved to the UN building). Beyond key coordination and communication mechanisms that were identified during the last internal CGIAR team meeting, several project / possible CRP2 activities between CRPs were identified: • RTB-CCAFS: (i) testing of RTB technologies (erosion control, varieties, etc.) in CSV's, (ii) climate suitability models and forecasting for RTB crops; • RTB-A4HN: (i) food systems research and role of RTBs for income generation / human nutrition; • RTB-Livestock: (i) use of cassava waste and sweet potato for animal feeding; • RTB-PIM: (i) inclusive value chain of RTB crops; The main production zones of RTB crops themselves do generally not overlap within Vietnam. Yet, some geographical sites where cassava research and CRPs overlap have been identified (see below). Opportunities for potato, sweet potato and banana R&D needs to be further identified. The sites where RTB clearly overlaps with other CRPs are: • RTB-CCAFS: Yen Bai province (north-east region of Vietnam). Here CIAT/RTB has a history of cassava work (including cassava management, varietal testing) while CCAFS have established a CSV (Ma Village). Also possible benchmark site for the new "livelihoods at scale" FP of RTB.

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		• RTB-Livestock: Dak Lak province (central highlands region of Vietnam). Here CIAT/RTB (with ACIAR funding) is working on cassava value chain research while the Livestock-CRP is working on pig husbandry. There is an opportunity to link. Also possible benchmark site for the new “livelihoods at scale” FP of RTB. Numerous options for such kind of collaborations exists, including: • Learning from different private sector or public private partnerships (PPPs) models in Vietnam, i.e. through CIP (new SFSA collaboration) and CIAT (ACIAR project, VICASS collaboration). • Collaborative R&D with CIRAD who have an active program in the country, comprising food systems, value chain, soil health and other areas of research. • Most CG centers involved in RTB already collaborate with agricultural and other universities in Vietnam, but crosscutting research could be more effectively coordinated at the CRP level. • There are numerous value chain focused NGO’s or service companies in Vietnam, including VECO, SNV, IDH and Fresh Studio. Some of the organizations are working on RTBs. Next steps: • Create opportunities to gain efficiencies for research support on data management, knowledge management and/or M&E. For example, there is an opportunity to streamline M&E and build a deeper and shared protocol with country / ecoregion specific impact pathways and indicators as basis for planning and reporting. Ideally we would develop a joint M&E plan and explore the possibility for CRPs to establish a shared Vietnam M&E facility/team • Identify the common inter-CG center research topics / activities which are relevant and in demand for all RTB crops in Vietnam, i.e. seed systems research, capacity building in breeding of clonally propagated crops, among others. Representatives of

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		Bioversity, CIP and CIAT have participated in the two meetings indicated Each CRP focal point in Vietnam has made a presentation of the CRP2 content, FPs and likely relevant areas for implementation. The content was consulted with CRP / CG center management. The main contributions from CRP representatives and national stakeholders is reflected in the integration plan. We are foreseeing the establishment of an RTB in-country hub hosted by CIAT Hanoi office. RTB researchers from CIAT and CIP are already co-located in the same office, while discussions are under way for a Bioversity banana scientist to be posted in the same office.
+ countries		
Cameroon Placeholder until meeting to be held March 16th	No meeting for site integration has been yet held in Cameroon. However I had the opportunity to attend the DRC site integration meeting organized in DRC. In DRC I discussed extensively with Manning-Thomas, Nadia (CGIAR Consortium) who was facilitating this meeting in DRC. In consultation with other CGIAR Centres (IITA, CIFOR, Bioversity) we decided to organize the Cameroon meeting on 16 March 2016. The following institutions are expected to attend this meeting: IITA, CIFOR, Bioversity, ICRAF, IRAD, AVRDC, MINFOF, MINEF, Universities of Yaounde1, IBAYSUP, CRESA. Prior to this meeting, the CGIAR centers based in Cameroon were already working together in projects such as Sentinel Landscapes. ICRAF, CIFOR and Bioversity developed joint teams and worked together on institutional mapping of a landscape, socio-economic characterization and land degradation surveillance. For ICRAF as more most of research activities are covered by FTA, Scientists focussed their activities that are linked to CRP6.1, CRP6.2, CRP6.3, CRP6.4, and CRP6.5. Data collected from this research work were analysed and used for publications of scientific papers. With IITA, ICRAF and IRAD had also worked together for the implementation of Humid Tropics program.	Nothing to report yet.

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	Overall, to date, the CRPS' joint initiative in Cameroon has created an approach involving several CGIAR centres (ICRAF, CIFOR, Bioversity), as well as other national partners (like IRAD-Cameroon's Institute of Agriculture for Development) to design partnership and identify research areas and priorities necessary for the development of the rural sector in Cameroon and other countries in the Congo Basin. When we meet on 16 March, we will identify research priorities and development a common program to address these.	
DR Congo Nzola M. Mahungu (IITA)	National consultation workshop for the integration of CGIAR centers took place in Kinshasa (Democratic Republic of Congo-DRC), February 19th, 2016. Nine CG centers (AfricaRice, CIAT, CIFOR, CIMMYT, CIP, ICRAF, IFPRI, IITA and ILRI,) operating directly or indirectly through partners participated at this workshop. The event brought together more than 60 public-private partners from DRC including the DRC civil society. CRP representatives, NARS, donors and government officials. It was indicated at the workshop that the second phase of CRP's (2017-2025) presents three innovations as compared to the first one: well-integrated portfolio, aligned with national priorities, and coordinated and transparent interaction with local stakeholders and partners. Thus, the national consultation workshop constituted the first step of the integration process and aimed to engage partnership, find synergies and learn about national priorities. During the event, participants debated DRC development challenges and priorities via panel and group discussions. Participants referred to examples of successful collaborations in DRC and strongly recommended a creation of a national R4D platform by IITA on behalf of CG centers in consultation with the Institut National d'Etude et Recherche Agronomiques (INERA) as government representative, Federation of farmers Cooperative as civil society representative and the chair of donors community.	RTB participated at the CRPs national consultation held in Kinshasa on Feb. 19th, 2016. During CRP I, RTB activities has some joint activities with maize CRP (CIMMYT), Humidtropics (IITA) and CRP4 (AN4H) Apart from the on-going cassava breeding (RTB) and biofortified cassava (AN4H), and cassava (RTB) and agricultural intensification (Humidtropics), there might be some coming with an Aflasafe project yet to be approved (AN4H), and a bilateral project on cassava value chain in eastern DRC also yet to be approved. Specific geographical sites identified where the CRP overlaps with others, to be explored Not identified per se, but exists in various AEZ of DRC (forest, savannah, RTB, grain legumes, maize intercropping, etc. Other collaborations with universities on capacity building, with INERA on RTB germplasm development and ensuing value chains, with advances ARIs on molecular tools, etc. Next steps: Mapping CRPs activities and the national priorities, joint upscale of results for greater impact, etc. Since the national consultation workshop, communication amongst CRPs representatives from the nine CG centers working in DRC is very active as we are trying to map activities, we hope to extend this flagship and CRP II leaders as we move to phase II. So far the communication is only with IITA DDG in charge of R4D.

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	Other themes identified by participants were to have forge a Common vision; to clearly define AR4D priorities; to aim at Impact at scale; and a strategy on Capacity development. Next step: The R4D platform coordinated by IITA will have its first meeting on 11 March 2012, to discuss amongst other issues: I. The role of the platform in DRC R4D agenda, its evolvement to a steering committee II. The mapping of CRPs present in DRC and refining/aligning CRP II to national priorities III. Explore possibilities of complementarities in sharing IITA and INERA infrastructures wherever feasible.	
Ghana Olufunke Cofie (IWMI)	Although not initially depicted as ‘integration’, CGIAR centres that are active in Ghana have been collaborating for a long time by sharing resources and working on different projects together. Since January 2016, nine Centres (AfricaRice, Bioversity, CIAT, CIP, IFPRI, IITA, ILRI, IWMI and WorldFish) and eight CRPs (A4NH, CCAFS, DCLAS, Maize, Rice, WLE, RTB, PIM) have been involved in the Ghana Site integration process. First, the Steering Committee (SC) was constituted by official nominations from the Centres/CRPS. Several virtual and face-to-face meetings were held prior to the national consultation workshop which took place from 2-3 March 2016 in Accra. Other preliminary activities carried out by the SC were: (i) mapping of Centre/CRP project locations, thematic focus, target commodities and partnerships in Ghana; (ii) Review of relevant national policy documents as well as donors’ priorities for Ghana; and (iii) engagement with and sensitization of local partners on the Site Integration Process. From the mapping and review exercise, the SC identified potential thematic areas for CGIAR collaboration in Ghana. Two key national partners of the CGIAR in Ghana are the Ministry of Food and Agriculture (MoFA) and the Council for Scientific and Industrial Research (CSIR). These two institutions co-organized the	RTB participation during planning and at the national consultation hosted by IWMI and held in Accra on 2-3 March. All of them are NARS partners working with CSIR-CRI or on secondment to IITA. They “represent” Bioversity in the case of banana plantain and IITA in the cases of yam and cassava. All RTB activities, except cassava, were mapped along with other CRP activities There has probably not much explicit site integration activity. Some of the Jumpstarting project sites are at the Dryland System benchmark sites. We seem to be the only ones there. Additionally, CRP RTB (CIP) has offices in the research institutes, CSIR-CRI and SARI where these crops are mandated with the national program. Our NIRS analytical lab is used occasionally and somewhat informally to analyze samples of most of the RTB commodities. In addition to IWMI, Africa Rice, Bioversity, IFPRI, and IITA were the centers most engaged with the exercise. IITA had a number of CRPs represented. We agreed that we should be thinking about new W3 and bilateral opportunities. Pointed out on several occasions the importance of RTB in the national diet = #1. However, we recognized that most of current CRP engagement is in the north of the country where donors are putting most of their money, but where cassava and bananas tend to be less important. There was general agreement, that one of the most promising

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	National Consultation workshop with the Centres/CRPs. Over 60 people from different stakeholder categories participated in the event. The workshop revealed how the integrated efforts of the CGIAR Centres can actually complement national priorities and those of other partners, towards agricultural transformation in Ghana. Following MoFA's presentation on the national priorities for driving Ghana's Shared Growth and Development Objectives, the participants identified and discussed key themes that could be the CGIAR strategic focus in Ghana. The themes identified were consistent with the preliminary findings from the review done by the SC. The workshop participants also suggested ways of working effectively together (internal integration) and with local partners (external integration). The workshop further provided insight on tracking the progress and impact of the integrations as well as the coordination mechanism to sustain the Site Integration Process. Next steps are: (i) finalise the site integration plan with the information gathered during the workshop; (ii) engage in regular consultation and exchange with the national partners through their representation in the steering committee and (iii) sharing information at national platforms. The SC agreed that sharing of information, as well as collaboration in joint activities and resource mobilisation is paramount to strengthen our integration. Collaboration will commence on the identified themes and with a joint visit to the National Development Planning Commission of Ghana.	opportunities for CG centers would be the new ADB program and that we should position ourselves very deliberately for that. We also agreed to look for other opportunities as they arise. Key NGOs, universities and donors (SNV, Canada, Netherlands, USAID, UDS, KNUST) were present at the meeting. In our case, MoFA was the lead participant in the discussions, with CSIR somewhat subordinate, mostly due to conflicting schedules. MoFA was a good lead, however, since they are the first point of call for donors interested in agriculture. The enthusiastic participation of MoFA was good, as it reflected general happiness with the CGIAR partnership. Next steps: The report will be out shortly. A number of follow up steps were planned. Communication with most relevant personnel (DDG-R, Thiele, SO1 leader, IITA and Bioversity reps on RTB).
India ICRISAT	India Country Consultation – Tuesday 22nd March 2016	CIP representatives participating in the CRPs integration meeting on 22 March 2015. CIP's activities sites are included into the CGIAR integration sites. The representative will be sitting in for RTB and also in CRP-DryInad Cereals & Legumes (DCL) in small group discussion
Kenya	No information available	The national workshop has been held on March 10 th -11 th and RTB has been represented. All CRP's have been asked to provide 1 slide in for a CRP presentation.

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		Pre-existing joint or coordinated work: • With ILRI on dual purpose sweetpotato for food and fodder • National research and development stake • USAID Accelerated Value Chain Development project with ILRI – Dairy, Livestock (semi-arid regions); ICRISAT –dryland cereals and legumes – CIP sweetpotato - potato Future collaboration: Hasn't been explored systematically yet, but potentially Livestock, Maize, CCAFS, WLE, A4HN Specific geographical sites: An activity map will be prepared Each center has a set of long-term public and private sector partners from research, business and development. However, at the national workshop there has been very little turn-out from business (1) and development (1) partners as well as from donors (only Australia). Next steps: • Make sure that meetings are not overrepresented by CGIAR staff (70%) • Better target potential partners with a concrete action plan • To implement effective collaboration coordination has to go beyond large workshops only attended by the well-known partners. Activities like trade fairs and proactive communication directly to stakeholders and potential scaling partners. So far very little, but further coordination will follow in the process of developing the site integration plan which will be submitted by the end of April. All RTB flagships have activities in Kenya and will be mapped into the site integration plan and furthermore we will identify potential collaborative actions. The process of coordination has generally been delayed by the CRP proposal writing process with all CGIAR centers.
Malawi	No information available	No information available
Mozambique	National consultation meetings 22 nd /23 rd March	We had our small meeting with CGIARs. We set up a date for the National consultation for the 22nd and 23rd of March. We hired a

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		local consultant to assist with the preparation. The other consultant the fees/honorarium is still under negotiation. We are now working on all logistics. The information on CRP will be ready before the end of this month.
Nepal Arun Joshi (CIMMYT) Sugden Fraser (IWMI)	The process of site integration in Nepal was initiated on November 9, 2015 by organizing a meeting of all CG centres working in Nepal. The site integration steering committee was formed (with one member from each CG/CRP centre). This included CIMMYT, IWMI, Biodiversity Int, IFPRI, IRRI, CIFOR and ICARDA. CCAFS was included in the subsequent meeting. Two meetings were held on 4th and 30th December to share information on work being done by each centre in Nepal and to plan for a stakeholder consultation meeting which was organized at Kathmandu on 11 January 2016. The purpose of the stakeholder meeting was three-pronged: to design the integrated research agenda, to consolidate CGIAR centres, and to coordinate with national actors and strengthen the coordination, collaboration and alignments with partners in line with national priorities and policies. More than 60 participants, representing 34 national institutions participated. The cost of this meeting was shared by all centres. A joint presentation on activities being undertaken by all CG centres on various CRPs in Nepal was presented and two discussion sessions were held. The first one focused on better alignment of current CGIAR research activities, whilst the second one on targeting stakeholders' needs. Opportunities for further alignment of CG programs and CRP integration were identified through shared goals, activities and increased partnerships. The minutes were prepared along with one pager blog and submitted to CGIAR. The next CG-national consultation meeting was proposed to be held in Nepal in January 2017. Highlights included how to better align CG work with national policy issues, demand for continued capacity building of local	No RTB participation in the national consultation. . No pre-existing joint or coordinated work yet existing. CIP is doing for potato and I have written to Bioversity, Nepal to know if they have any activity related to RTB). IWMI office is also there. There is no integration among the CG centers for RTB in Nepal but needs to be explored for new RTB activities/projects. CIP has one bilateral project on potato information will be gathered through consultation meeting with partners Specific geographical sites identified where the CRP overlaps with others, to be explored yet. CIP has two non-CGIAR partners (LIBIRD-NGO and National Potato Research Program under National Agriculture Research Council). Next steps: Develop and circulate a template to stakeholders to gather information what they need and how poor farmers/consumers can be benefitted RTB will be in the site integration meeting being organized by ICRISAT in Delhi on 22 March 2016. Suggest organization of a one day site integration meeting of CG centers working in Nepal in Kathmandu or Pokhara such as Bioversity, IWMMI, CIP and stakeholders (NARC- Nepal Agriculture Research Council, LIBIRD etc) to review collation of current CGIAR research in Nepal, determine process for engaging stakeholders in Nepal, develop a template to gather information and to discuss plans for assessing impact. Consultation with representatives of partners and beneficiary groups where they aim to deliver outcomes at scale, including governments, NGOs, farmer organizations, processors and others along the value chain, and, ultimately, consumers. The coordinated commitments in different ecologies can be

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	agricultural scientists, the development of stronger national databases, promoting local genetic resources and the need for research on both climatic and non-climatic stress on agriculture. Ideas for new research avenues were also raised. For more info, see https://library.cgiar.org/handle/10947/4148 The next steering committee meeting has been scheduled for 10th March to draft the site integration. This is being done based on the national consultation and experiences of each of the centers in Nepal. In doing all this, the central point will be the Agriculture Development Strategy (ADS 2015-2035) approved by Government of Nepal on 14th August, 2015.	summarized in site integration plan to enable transparent interaction with local stakeholders.
Rwanda Kirimu Sindi (CIP)	The Rwanda CGIAR country collaboration and site integration process is coordinated by a committee of six individuals representing 4 centres. The Rwanda based CGIAR Centres are CIP, CIAT, IITA, and ICRAF. Each centre has one or two individuals as part of the steering committee. The centres have held 4 site integration meetings so far. One was with three main donors represented in Rwanda (USAID, EU, and DFID). The committee is working on mapping all on-going projects in Rwanda by the different centres and CRPS. This will be put on a map of Rwanda to assist all the centres understand areas where they are there is potential for synergy in working together. The map will assist the CG centres in communicating the contribution they are having to the donors and government policy makers and speak as one voice. The committee under the leadership of CIP will organized a CGIAR site integration workshop in Kigali on 29th March, 2016. This workshop will bring together an estimated 75 representative of donors, government agencies, other development organizations, civil societies, and financial institutions. There has been an already established forum R4D by Humid and Tropics that brings together all the CGIAR centres, policy makers, and other implementing partners in working together in an integrated manner. The site integration committee has resolved to build on this already on	RTB will participate not as a CRP but as centers that work on RTB crops. That is CIP and IITA Under Humid and Tropics CRP a R4D site was identified where all the centers are working together. Currently there are no W1 and W2 funds I know of that are utilized here by any center. However, in the past RTB partly funded PRA work that is coordinated by IITA, CIP and Bioversity, We are mapping where all the projects under CRPs and Centers are working. Since this country is very small, CIP and IITA are working in common districts and there are opportunities to have common sites on the ground. However, the mapping is still on-going and I cannot specify a particular site yet. In Rwanda all CGIAR centers and CRPs have to work with the government bodies such as Rwanda Agricultural Board (RAB), Local governments in the districts, University of Rwanda. CIP is working with University of Rwanda, Mount Kenya University, Kepler Institute, Local development organization, international development organization such as World Vision, CRS, One Acre Fund. CIP is collaborating with FAO, One UN, and UNICEF. Next steps: This is yet to be addressed but the Centers are planning to strengthen the collaboration. At the moment we share resources like office space, vehicles, and conference or meeting

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	going forum and expand it further to achieve the CGIAR site integration goals. Next steps: • We will be setting up a full secretariat to assist in organising the workshop and all the invited participant will get invitation letters by 11th March, 2016. • Next review meeting will be on 18th March, 2016 to review the plans and progress for the workshop preparations • The main workshop meeting to be held on 29th, March 2016. This meeting will gather stakeholders views and then utilizing the recommendation to work on the site integration plan that will be finalized by end of April, 2016. We will be posting all the minutes to the CG sites in the next two weeks.	rooms. We expect that we shall be utilizing same implementing partners when possible to implement our projects on the ground. We are being requested by donors to actively lobby the government as one CGIAR body when we want to influence policies. So far we have had 5 site coordination meetings 4 for planning and one a joint meeting with donors. IITA and CIP staffs are always represented. We are planning to fund the site integration forum through the centers contributions and CIP and IITA will contribute. The current site integration committee has two members from all the centers in Rwanda (CIP, CIAT, IITA, and ICRAF (1)). CIP being the lead center chairs all the meetings and is responsible for convening meetings and other activities. We have also welcomed Humid and Tropics site coordinator from Rwanda Agricultural Board to be part of the Forum organizing committee. After the forum we will then plan on the future activities and the role each center will play.
Uganda Eldad Karamura (Bioversity)	The site integration process in Uganda is jointly chaired by Bioversity and CIP on a 2-year rotational basis, with Bioversity starting in 2016. A steering committee involving all the 8 CGIAR centres present in Uganda (Bioversity, CIAT, CIP, ICRAF, IFPRI, IITA, ILRI, and IWMI), was formed and held its first meeting on January 27, 2016. At that meeting the 1st Consultation Stakeholder meeting was fixed for 9 March 2016. All centres agreed to share the costs of the stakeholder consultation workshop. A second Steering Committee meeting was held on 11 February 2016, following which the chair and co-chair visited some key NARS stakeholders such NARO-Uganda DG and Makerere University. CIAT member consulted with the Uganda National Farmers' Federation, while the IWMI member consulted with teams in the Ministry of Finance. These consultation helped to collect secondary data and afforded us opportunities to interact with key stakeholders. The steering committee resolved that the first stakeholder workshop be co-hosted with the National Agricultural	RTB participation in the national consultation through Bioversity, CIP and IITA. Initial discussions started with the NARS presenting their national R & D priorities while the CG presented theirs in Uganda. In the issuing discussions, it emerged that the NARS need to consult widely in their constituency while the CG need to develop their vision, mission, and other strategic objectives for Uganda in order to have meaningful discussions. Both the NARS and CG entities agreed that this is going to be a continuous process of engagement. It is also perceived as multi-layered with different partners along the value chains in the food agri-business; must include policy and environment advocacy partnerships RTB and Humidtropics strong collaboration. A key number of research outputs and processes jointly produced. There are many examples of successful inter centre/CRP collaboration such as HarvestPlus, CIALCA, Banana Xanthomonas Wilt, etc from which

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	Research Organization (NARO) of Uganda in order to enhance ownership by national partners. The third Steering Committee meeting was held on February 29, 2016 and focused on the plans for the implementation of the Stakeholder Consultation workshop; drew up the program, agreed on the discussion issues and the details of workshop outputs. Other staff members from the CRP working in Uganda are email-looped into all communications regarding the CGIAR site integration process right from the start. We hold internal brief consultations to discuss issues on the structure and content of on meeting agendas and usually arrive at a common consensus. Minutes from these meetings are shared to all members of the steering committee through whom information is shared with respective centre teams. In addition, we are collecting information from partners and stakeholders and we hope to build this information into sharable data about our site. Materials collected so far include: • CGIAR major partners/collaborators in Uganda. • documents that highlight national development priorities in Uganda. • CGIAR research work in Uganda. • Individual project activities The CGIAR site integration committee has so far not reached a stage of discussing potential bilateral project or W1/2-funded activities planned in Uganda for joint activities amongst CRPs. However, in our discussions, we noted that for several CRPs operational in Uganda, there are already several clusters of centres collaborating in one or more of the CRPs and sharing sites among themselves and with NARS. The Humidtropics Uganda action sites of Mukono-Wakiso and Kiboga-Kyankwanzi field sites seem to be common sites in which many CGIAR centres are currently working including ILRI, CIP, IITA, Bioversity, ICRAF and	lessons can be drawn to build truly CRP programs. Joint publications will require agreements on authorship and copy right issues. The engagement could be extended to our NARS partners. Geographical sites: Central Uganda (Mukono, Luwero and Kiboga districts); RTB overlaps with HT. The Site Integration meeting identified NARO-Uganda, Makerere University, Uganda Christian University, World Vision. A credible set of good examples of shared research sites is documented and available This is already happening informally but can be formalized. The definition of 'site' will need to be agreed; is it based on the political boundaries or on agroecologies (hence cutting across borders)? A number of Centers are already sharing research sites under Humid Tropics and RTB-banana; ICRAF has common sites with ILRI on dairy in central and eastern Uganda; and with CIFOR and CAIT under sentinel landscapes. It makes a lot of sense to converge both at field research and policy engagement levels in order to strengthen interdisciplinary/sectoral approaches on the one hand and policy engagement on the other 6. Next steps: • There is a framework in place to facilitate effective site integration but there is no specific financial support to make it happen. • There is a need to develop CG country-specific strategic objectives, subtended by RBM tools and approaches to provide rallying focus for the CRPs in the country. • Cross-cutting activities such as gender and other systems work should be internally coordinated and information collected and shared to cut costs. • Although many CRPs and W3 projects are already sharing facilities and sites (with NARS), there is room for improvement. Some arrangements should be reached with partner NARS so that similar tools are used to collect data and data sharing made possible.

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	CIAT. Furthermore, it was noted that centres were already sharing laboratory facilities along with NARO-Uganda institutes. The workshop on March 9, 2016 will lay the foundation for a long term engagement between the CRPs and Ugandan partners and stakeholders. Our intention at this stage is not to come up with a complete work plan/site integration plan during the actual meeting but to really listen to and discuss with partners and stakeholders about the development priorities for Uganda; what the various stakeholders and partners are doing themselves to meet those priorities and goals; and exploring what the opportunities are for partnership, alignment and working together towards these goals. The outputs of the meeting will guide the development of our site integration plans while informing the CRP II process.	• Sharing CRP and center program plans for Uganda, to identify opportunities for alignment, co-location and sequencing linked to acceleration of data sharing both between CG and with national partner - customizing Open Access to Uganda. • Current research seminars, policy dialogues and other CGIAR wide engagement need to be strengthened to produce knowledge/policy briefs. • Communicating outcomes of these engagements need to make their way to projects/programs (bilateral and CRP) and even to SRF when updated. RTB represented in the Site Integration process: • All RTB centers are fully represented at the Site Integration Committee. • They have all participated in 4 steering Committee meetings so far. • CIAT, IITA and Bioversity were already working together in the framework of CIALCA Coordination internally: • There is Group email where at least two people from the 8 centers subscribe; • Every center representative is expected to be the link pin to the mother center for information flow about our discussions to provide feedback.
Zambia Peter Setimela (CIMMYT)	The first step towards site integration was the establishment of a steering committee composed of representatives from CIMMYT, ILRI, WorldFish, HarvestPlus, CIAT, IITA, Bioversity, ICRAF, ICRISAT and CIP. The steering committee developed the agenda for the site integration consultation workshop which was held from the 9-10 February 2016 in Lusaka. The workshop brought together stakeholders from the CGIAR Research Programs (CRPs), Ministry of Agriculture and Livestock, research agencies, academic institutions, donors, NGOs and the private sector. The consultative meeting came against the background of the launch of the Second Phase of the CRPs, focusing on integrated research	Participation in the consultation since the beginning. Experience under the USAID-Feed the Future Programme project where IITA was leading the Consortium. We had ICRISAT (groundnuts +aflatoxin), CIP (Orange sweet potato), CIMMYT (maize, Simileza (Maize and Soya Bean/Cowpea farming system), Harvest Plus (Bio-fortification), IITA (cassava, Similesa, and aflatoxin). This project was implemented over 4 years in Eastern Province of the country. We had opportunity to work together. The meeting did not arrive at that point of identifying activities. These deliberations allowed the representatives to appreciate the

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	agendas to more effectively contribute to the objectives and targets set by the Strategic and Results Framework of CGIAR and also to align the CRPs research agenda with national agricultural priorities in Zambia. From the workshop, the participants identified key elements that would lead to successful site integration, the key elements are summarised under the headings of: core values, administration and management, technical, communication and resource mobilisation in the workshop report. Furthermore, participants identified key activities that would be required to bring about site integration and which areas they would like to proceed in partnership with the CGIAR and CRPs. The Zambian National Agriculture Investment Plan (NAIP) provided a basis for the discussions and is key in ensuring the alignment of the research and development priorities in the Zambia agricultural sector goals. The key issues identified for site integration included the following: a) Resource mobilization to drive the site integration process b) Development of coordination structures to provide strategic direction for site integration c) Shared vision among CGIAR Centers and national partners d) Capacity development of national partners and research infrastructure e) Collaboration mechanisms f) Alignment of CGIAR research activities to national priorities g) Identification of research priorities, effective delivery and scaling-out h) Impactful development initiatives to ensure improved production, food and nutrition security for smallholder farmers in Zambia. i) Coordinated and harmonized communications strategy encompassing learning hubs to share lessons.	whole concept of site integration and the new thinking of CGIAR under the Second Phase of the CRPs. The critical next steps were agreed on and it concludes the following among others • Incorporation of the workshop inputs and agreed actions into the CRP proposal • Implementation of the ideas identified and discussed during the workshop • Feedback on the high level meetings to follow and decisions on Zambia Site Integration. • Developing a plan for site integration and soliciting buy-in No site has been identified yet. Collaboration mostly with private sector, such as investors who are called by the government to diversify the agriculture It is planned a high level meetings to follow and decisions on Zambia Site Integration There has not been pre-existing mechanisms where the CRP has been involved in to coordinate across centers/CRPs in-country

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	The workshop also identified critical steps that will lead to the establishment and coordination structures to drive site integration in Zambia.	

ANNEX 7: RTB Staffing of management team and flagship projects

Program Management Unit

Name: Graham THIELE

Current position and affiliation: Program Director, CGIAR Research Program on Roots, Tubers and Bananas (RTB)

Profile:

- Building a shared vision and mobilizing people and resources
- Strategic leadership and facilitation of multi-country research teams with diverse partners
- Promoting innovation processes in varietal adoption, value chains and seed systems
- Priority setting, adoption studies, impact assessment and evaluation approaches
- Participatory research and extension methods
- Project proposal development and project management
- Commitment to improving the well-being of the poor and gender equity through research

Employment:

- 2012-2015. Director RTB. International Potato Center (CIP), Peru
- 2006-2011. Leader of Impact Enhancement Division. International Potato Center, Peru
- 2002-2006. Head of Mission. CIP, Ecuador
- 1998-2006. Coordinator Papa Andina Initiative. CIP, Bolivia and Ecuador

Education:

- Ph.D., 1983, Social Anthropology, Cambridge University, Cambridge, United Kingdom
- M.Sc., 1983, Agricultural Economics, Wye College, University of London, London, United Kingdom

Selected Recent Peer-reviewed publications: (

- Thiele, G. (1999). "Informal potato seed system in the Andes: Why are they important and what should we do with them?" *World Development*. 51
- Thiele, G., A. Devaux, I. Reinoso, H. Pico, F. Montesdeoca, M. Pumisacho, J. Andrade-Piedra, C. Velasco, P. Flores, R. Esprella, A. Thomann, M. Manrique & D. Horton (2011). "Multi-stakeholder platforms for linking small farmers to value chains: evidence from the Andes." *International Journal of Agricultural Sustainability* 9(3)
- Thiele, G., K. Theisen, M. Bonierbale and T. Walker (2010). "Targeting the Poor and Hungry with Potato Science." *Potato Journal* 37(3-4): 75-86
- Fuglie, K. and G. Thiele (2009). Research Priority Assessment at the International Potato Center (CIP). *Prioritizing Agricultural Research for Development*. D. A. Raitzer and G. W. Norton, CABI: 25-43
- Sarapura-Escobar, Silvia, Hambly-Odame, Helen, and Thiele, Graham. 2015. Gender and Innovation in Peru's Native Potato Market Chains. Book Chapter. In: *Transforming Gender and Food Systems in the Global South*. IDRC, Canada (in press). Taylor and Francis

Other Evidence of Leadership, large-program management and delivery:

- Leadership role with CIP scientists in securing project funding including BMGF Funded Sweet Potato Project (\$m 20), Andean Change Program (\$mill. 6.3) and Belgian Cooperation Funded Ahipa Project (\$mill. 4.7). Led the Andean Change Program on behalf of CIP and CIAT, with 20+ national partners, in four countries to assess participatory innovation processes, leverage advocacy and influence policy
- Head of the CIP Division which coordinates and carries out impact and adoption studies of new agricultural technology, including a global impact study of potato varieties. Implemented center wide protocols for collection of baseline and survey data. Contributed to innovation in potato value chains in the Andes with wide scale uptake of varieties and market access with native varieties.

Role: Program Director and lead of new proposal development

Name: Bhawana UPADHYAY

Current position and affiliation: Gender Coordinator Scientist, CGIAR Research Program on Roots, Tubers and Bananas (RTB)

Profile: Main expertise area: Gender Equality and Social Inclusion (GESI)

Employment:

- 2011-2015: Program Officer-Gender and Rights, Center for People and Forests (RECOFTC), Thailand
- 2006-2010: Program Manager- GESI, Oxfam GB, Nepal
- 2002-2005: Associate Expert-Gender, Water and Poverty, IWMI, India

Education:

- 2004: Interdisciplinary Doctoral Program (Development Research), ZEF, Germany
- 2002: Master of Policy Studies (Public Policy), GRIPS, Japan
- 2000: Master of Science (Community Development), UPLB, Philippines

Selected Recent Peer-reviewed publications:

- Upadhyay, B., 2015, Mainstreaming Gender into Forest Policies in Asia and the Pacific, A Synthesis Report covering Eight Countries (Cambodia, Fiji, Indonesia, Nepal, Philippines, Sri Lanka, Thailand, and Viet Nam), FAO-RECOFTC: Thailand.
- Upadhyay, B., 2015, Understanding Women's Inclusion in Forestry, Policy Briefs covering Eight Countries (Cambodia, Fiji, Indonesia, Nepal, Philippines, Sri Lanka, Thailand, and Viet Nam), FAO-RECOFTC: Thailand.
- Upadhyay, B., 2012, Farming Women and Irrigation Technology: Cases from Nepal, in M. Zwarteveen, S. Ahmed and S. Gautam (eds), Diverting the Flow, SaciWATERS.
- Upadhyay, B., 2006, Poverty and Gendered Livelihood: Making Water Work, in K.L. Datta (ed), Fluid Bonds, Stree Publications and Australian National University (ANU).
- Upadhyay, B., 2005, Women and Natural Resource Management: Illustrations from India and Nepal. Natural Resources Forum. Vol. 29, No. 2.
- Upadhyay, B., 2005, Gendered Livelihoods and Multiple Water Use in North Gujarat, Agricultural and Human Values Journal, Vol. 22, No. 3.
- Upadhyay, B., 2004, Gender Aspects of Smallholder Irrigation Technology: Insights from Nepal, Journal of Applied Irrigation Science, Vol. 39, No. 2.
- Upadhyay, B., 2003, Water, Poverty and Gender: Review of Evidences from Nepal, India and South Africa, Water Policy Journal, Vol 5 Issue 5.

Role in RTB: Leader, gender portfolio.

Name: Dagmar WITTINE

Current position and affiliation: Program Management Officer, RTB Program Management Unit

Profile:

Project-management/methodological expertise/Organisational development: Diploma in systemic organisational development and leadership skills/management tools; management of the complete lifecycle of projects of/with different international donors: Analysis and development of best-practice-models, lessons learnt and strategic guidelines, Redaction of reports and didactic materials.

Agriculture / sustainable natural resource management: Sustainable agriculture, agricultural value chain development, Socio-economics, income generating activities in the field of agriculture, microcredits, etc. Nature conservancy, Participatory Protected Area Management.

Employment:

- 2006 – 2013, Senior Projects Manager. Agriculture and Food Consultants International GmbH (AFC), Bonn (Germany): Business development for Agriculture, Food security, sustainable/integrated rural development.
- 2002-2005, Expert for Planning and evaluation of agricultural projects, German Development Service (DED, since 2011: GIZ), Bolivia.
- 2001 – 2002, Scientific assistant, Centre for Tropical and Subtropical Agriculture and Forestry (CeTSAF), University of Goettingen, Germany.

Education:

- 2001: Magister scientiarum agrariarum (M.sc.sgr.), Tropical and Subtropical Agriculture. University of Goettingen, Germany
- 1998: Magister Artium (M.A.), Anthropology & Development Sociology & Political Sciences. University of Bayreuth, Germany

Selected Recent Peer-reviewed publications: N/A

Other Evidence of Leadership, large-program management and delivery:

Project identification and acquisition/Resource mobilization. Backstopping, steering of implementation of projects/programmes. Creation and maintenance of professional networks (Networking). Strategic Planning (Program structure, portfolio, proposal writing/editing, program strategies for different technical areas as gender, communication/media/PR, capacity development, partnerships, etc)

General Management Processes (deputize Program director, focal point for external Program audits and evaluations), Manage: internal Monitoring and Evaluation Processes / Results Based Management; finances and contracts, staff supervision/coaching. Ensure good communication Management Unit internal and with all Program participating Centers scientists and administrative units

Role in RTB: Program Manager with M&E tasks

Name: Holly HOLMES

Current position and affiliation: Communications Specialist, CGIAR Research Program on Roots, Tubers and Bananas

Profile:

As the RTB communications specialist, Holly oversees the program's strategic communication direction, internal communication, event coordination, website, blog writing, social media and media relations, among other activities. During her time at WorldFish, Holly contributed to communication strategies for both the center and the CGIAR Research Program on Aquatic Agricultural Systems. Holly also developed and implemented communication outreach strategies for key campaigns and events, including placing stories and opinion pieces in international and regional media outlets. As a Writer, Holly specialized in communicating the center's key research successes in a variety of mediums to audiences including partners and donors.

Employment:

2014 – 2015 – Writer, WorldFish, Malaysia

2012 – 2014 – Communications Assistant, WorldFish, Malaysia

2012 – 2012 – Public Relations Intern, Queensland Museum and Science Centre, Australia

2011 – 2011 – Campaign Assistant, Amnesty International, Australia

Education:

2012: Bachelor of Communication, Public Relations, University of Queensland, Australia

2012: Bachelor of Journalism, University of Queensland, Australia

Selected Recent Peer-reviewed publications: None

Other Evidence of Leadership, large-program management and delivery: -

Role in RTB: Communications Specialist, CGIAR Research Program on Roots, Tubers and Bananas

Name: Michael FRIEDMANN

Current position: Science Officer, CGIAR Research Program on Roots, Tubers and Bananas (RTB)

Profile: Extensive research experience in agricultural sciences, horticulture, breeding, genetics, genomics and life sciences. Project manager in multidisciplinary applied plant genomics projects. Team leader-tomato breeding in public research institute.

Employment:

- 2015-present: Science Officer, RTB Program, CIP-CGIAR, Lima, Peru
- 2008-2015: Project & Research Manager, University of British Columbia, Vancouver, Canada
- 2006-2007: Manager, Drug Discovery, Forbes Medi-Tech, Vancouver, Canada
- 2002-2006: Research Associate, University of British Columbia, Vancouver, Canada
- 1995-2002: Scientist, Tomato Breeding & Genetics, Volcani Center ARO, Bet-Dagan, Israel

Education:

- 1989: PhD Horticulture, Washington State University, USA
- 1981: MSc Field & Vegetable Crops, Hebrew University of Jerusalem, Israel

Selected Recent Peer-reviewed publications:

McKown AD, Klápště J, Guy RD, Geraldes A, Porth I, Hannemann J, **Friedmann M**, Muchero W, Tuskan G, Ehling J, Cronk Q, El-Kassaby Y, Mansfield S, & CJ Douglas (2014) Genome-wide association implicates numerous genes underlying ecological trait variation in natural populations of *Populus trichocarpa*. **New Phytologist** 203:535-553.

Porth I, Klápště J, Skyba O, Hannemann J, McKown AD, Guy RD, DiFazio SP, Muchero W, Ranjan P, Tuskan GA, **Friedmann MC**, Ehling J, Cronk QCB, El-Kassaby YA, Douglas CJ & SD Mansfield (2013) Genome-wide association mapping for wood characteristics in *Populus* identifies an array of candidate SNPs. **New Phytologist** 200:710-726.

Geraldes A, DiFazio SP, Slavov GT, Ranjan P, Muchero W, Hannemann J, Gunter LE, Wymore AM, et al. (2013) A 34K SNP genotyping array for *Populus trichocarpa*: Design, application to the study of natural populations and transferability to other *Populus* species. **Molec Ecology Res** 13:306-323.

Friedmann M, Ralph SG, Aeschliman D, Zhuang J, Ritland K, Ellis BE, Bohlmann J & CJ Douglas (2007) Microarray gene expression profiling of the developmental transition from primary to secondary growth and constitutive defense in Sitka spruce (*Picea sitchensis*) apical shoots. **J Exp Bot** 58: 593-614.

Lapidot M, **Friedmann M**, Pilowsky M, Ben-Joseph R, & S Cohen (2001) Effect of host plant resistance to *Tomato yellow leaf curl virus* (TYLCV) on virus acquisition and transmission by its whitefly vector. **Phytopathology** 91: 1209-1213.

Friedmann M, Migone TS, Russell SM, & WJ Leonard (1996). Different interleukin 2 γ -chain tyrosines couple to at least two signaling pathways and synergistically mediate interleukin 2-induced proliferation. **Proc Natl Acad Sci USA** 93: 2077-2082.

Other Evidence of Leadership, large-program management and delivery:

Project Manager of multi-partner, multidisciplinary Genome Canada funded project using WGS to identify alleles in poplar associated with adaptation and wood chemistry traits. As tomato breeder lead, developed fully resistant geminivirus resistant cultivars, and was recipient of several competitive international grants.

Role in RTB: Science Officer for RTB CRP.

Name: Selim Erdil GUVENER

Current position and affiliation:

Compliance and Intellectual Assets Manager, International Potato Center (CIP)

Profile:

Lawyer with 12 years (7 years post-qualification) experience. Trained in French, English and Turkish law. Called to the Bar in Turkey and member of the Law Society of England and Wales. Practice focused on International relations; policy; compliance; intellectual property management; natural resources management; technology transfer. Experience in international agricultural research and development with ICRAF, CIP, and AfricaRice. Private sector and natural resources management experience providing legal advice to Iron and Steel, Petroleum, Pharmaceutical and Telecommunications companies in regulatory compliance and intellectual property.

Employment:

2013 - present: Compliance and Intellectual Assets Manager, International Potato Center, Peru.

2010 - 2013: Attorney, Guvener Law Offices, U.K. / Turkey.

2006 - 2007: Attorney, Pekin & Bayar Law Firm, Turkey.

2004 - 2005: Trainee Attorney, Cerrahoglu Law Firm, Turkey.

Education:

2008: Master of Laws, International and Environmental Law, Cambridge University, U.K.

2006: Master of Arts, International Relations, Institut Européen des Hautes Etudes International, France.

Selected Recent Peer-reviewed publications:

None

Other Evidence of Leadership, large-program management and delivery:

Experience in the management of public listings and takeover projects of large companies with leadership and collaboration of teams of lawyers, bankers and business managers:

- Privatization of Turkish Iron and Steel Company (ERDEMIR) for US\$ 2.77 billion; advising a consortium of international bidders on due diligence, asset valuation, risk assessment and regulatory compliance.
- Privatization of Turkish State Petroleum Refineries (TUPRAS) for US\$ 4.14 billion, representing a German/Austrian consortium of bidders on due diligence, asset valuation, risk assessment and regulatory compliance.
- Initial Public Offering of Digiturk Media (largest satellite TV network in Turkey) at LSE and NYSE representing the company with extensive IP and regulatory compliance assessments.
- Takeover by competitive bidding of 75% of Eczacibasi Pharma by Zentiva N.V. for € 430 million, representing the buyer in due diligence, risk assessment, company valuation, share purchase agreement and shareholders agreement.

Role in RTB. Compliance and Intellectual Assets Manager located within the Project Management Unit for overall coordination of intellectual property management and compliance with donor, national and international regulatory framework.

FP1: Enhanced genetic resources

Name: Clair HERSHEY

Current position and affiliation: Leader, Cassava Program, CIAT

Profile:

Expertise in research program development and management for crop improvement, including full value chain integration

- Led a global cassava breeding team with broad national program partnerships
- Led an interdisciplinary global team of scientists to develop, together with partners, cassava technologies that raise farmer incomes, improve food security and nutrition, and protect the environment in cassava-based systems
- Provided leadership to RTB planning and program execution
- PI for multiple bilateral cassava projects, including cassava doubled haploids (global), cassava processing (global), and cassava seed systems (Haiti)
- Developed communication and training tools to support plant breeding capacity development at the global level

Employment:

- 2011 – present: Leader, Cassava Program, CIAT, Cali, Colombia and RTB Center Focal Point (CIAT)
- 2009 – 2010: Visiting Scientist at FAO's Global Partnership Capacity Building Initiative for Plant Breeding (GIPB)
- 1992–Present (active to 2009): Partner, Hershey Brothers Farms (Lancaster County, PA, USA)
- 1978-1991: Plant Breeder, Cassava Program, CIAT, Cali, Colombia

Education:

- 1978: PhD, Major field in Plant Breeding; Minor fields – Entomology; International Agriculture, Cornell University

Selected Recent Peer-reviewed publications:

- Ceballos, H., Kawuki, R. S., Gracen, V. E., Yencho, G. C., & Hershey, C. H. (2015). Conventional breeding, marker-assisted selection, genomic selection and inbreeding in clonally propagated crops: a case study for cassava. *Theoretical and Applied Genetics*, 1-21.
- Hershey, C.H. and Neate, P. (eds.). (2013). *Eco-efficiency: From vision to reality* (Issues in Tropical Agriculture series). Centro Internacional de Agricultura Tropical (CIAT), 252 p. -- (CIAT Publication No. 381).
- Ceballos, H., Hershey, C., & Becerra-López-Lavalle, L. A. (2012). New approaches to cassava breeding. *Plant Breeding Reviews*, Volume 36, 427-504.
- Mba, C., Guimaraes, E. P., Guei, G. R., Hershey, C., Paganini, M., Pick, B., & Ghosh, K. (2012). Mainstreaming the continuum approach to the management of plant genetic resources for food and agriculture through national strategy. *Plant Genetic Resources*, 10(01), 24-37.
- Guimaraes, E. P., Debouck, D., Beebe, S. E., Pompilio Martínez, C., Hershey, C. H., & Ceballos, H. (2011). Pre-breeding. An alternative to add value to the plant genetic resources. *Sveriges Utsädesförenings Tidskrift [Journal of the Swedish Association]*, 118(2).

Other Evidence of Leadership, large-program management and delivery:

- Leadership in integrating genetic resources and breeding during positions held at CIAT and FAO and multiple consultancies including Global Crop Development Trust and Bioversity International
- Full engagement with development and execution of RTB research and capacity development agenda since 2011

Role in RTB: Leader of Flagship 1: Discovery: Enhanced Genetic Resources

Name: Merideth BONIERBALE

Position: Senior Breeder and Leader, Genetics, Genomics & Crop Improvement DCE, International Potato Center (CIP)

Profile:

Plant Breeding, comparative genetic mapping, pre-breeding/ trait transfer, base-broadening breeding with crop wild relatives; valorization of landrace diversity; Biofortification; disease and stress resistance; Committed to team work and improving processes and capacities for individual and team results.

Employment: List last four positions held

- 1997- present: Senior Breeder & Leader, Genetics, Genomics & Crop Improvement, CIP, Peru
- 1992-1996: Cassava Geneticist, CIAT, Colombia,
- 1990-1992: Post-doctoral Scientist, Plant Breeding Department, Cornell University, Ithaca, NY

Education:

- 1990: PhD in Plant Breeding, Cornell University, US
- 1987: MSc in Plant Breeding and Plant Pathology, Cornell University, US
- 1975: B.Sc. in Plant Science, Cornell University, US

Selected Recent Peer-reviewed publications:

- 1) Andre, C.M., Bonierbale, M., Burgos, G., Evers, D., Ziebel, J., Guignard, C., Huasman, J.F., Zum Felde, T. (2015). In vitro bioaccessibility and bioavailability of iron from potatoes with varying vitamin C, carotenoid and phenolic concentrations. *Journal of Agricultural and Food Chemistry (JAFC)*. Vol.63, pp.9012-9021
- 2) Mihovilovich, E., Sanetomo, R., Hosaka, K., Ordoñez, B., Aponte, M., & **Bonierbale, M.** (2015). Cytoplasmic diversity in potato breeding: case study from the International Potato Center Molecular Breeding, Vol. 35, p1, 10 p.
- 3) Lindqvist-Kreuzer, H., Gastelo, M., Perez, W., Forbes, G.A., De Koeyer, D., **Bonierbale, M.** (2014) Phenotypic Stability and Genome-Wide Association Study of Late Blight Resistance in Potato Genotypes Adapted to the Tropical Highlands. *Phytopathology*. ISSN: 0031-949X. Vol: 104, 624-633 pp.
- 4) Paget, M., Amoros, W., Salas, E., Eyzaguirre, R., Alspach, P., Apiolaza, L., Noble, A., **Bonierbale, M.** (2014). Genetic Evaluation of Micronutrient Traits in Diploid Potato from a Base Population of Andean Landrace Cultivars. *Crop Science*. ISSN: 0011-183X. Vol: 54. Pages: 1949-1959.
- 5) Sharma, S.K., Bolser, D., de Boer, J., Sørensen, M., Amoros, W., Carboni, M.F., D'Ambrosio, J.M., de la Cruz, G., Di Genova, A., Douches, D. S., Eguiluz, M., Guo, X., Guzman, F., Hackett, C.A., Hamilton, J. P., Li, G., Li, Y., Lozano, R., , **Bonierbale, M.**, (2013) Construction of Reference Chromosome-Scale Pseudomolecules for Potato: Integrating the Potato Genome with Genetic and Physical Maps. *G3-Genes Genomes Genetics*. ISSN: 2160-1836. Vol:3. Pag: 2031-2047.

Other Evidence of Leadership, large-program management and delivery:

Project and program management in range of \$ 0.5 - 7Mio- strategic direction, monitoring and evaluation, fund-raising, reporting; Crop Leader for potato (HarvestPlus) realizing first significant genetic gains for micronutrient content with small team over 10 years.

Role in RTB: Cluster Leader DI1.1: Breeding Communities of Practice of Flagship Project FP1: Discovery Enhanced genetic resources; and Support Leader for Cluster PO2.5: Potato varieties for Asia of Flagship Project FP2: Productive varieties and quality seed.

Name: Luis Augusto BECERRA LOPEZ-LAVALLE

Current position and affiliation: Principal Research Scientist – Group Leader – Genetics and Genomics - International Centre for Tropical Agriculture (CIAT) – Cassava program.

Profile:

Principal Research Scientist – Group Leader – Genetics and Genomics - International Centre for Tropical Agriculture (CIAT) – Cassava program. This recent promotion will also involve leading the cassava digital genebank and implementing the NextGeneration breeding agenda of the new CRP on RTBs.

Luis Augusto is an experienced principal agricultural research leader with a demonstrated ability to strategize, mobilize resources, and manage professional research teams for crop improvement. He is well respected in the agricultural research for development (R4D) community for his expertise in designing innovative and impactful solutions through frontier genetics and biotechnology tools.

Luis Augusto serves as a Principal Research Scientist at the International Center for Tropical Agriculture (CIAT), in charge of leading the Cassava Program's Plant Molecular and Quantitative Genetics Laboratory. In this role, he assembled and managed a professional research team of up to 30 researchers.

Employment:

- 2015-present: **Principal Research Scientist – Group Leader** – Genetics and Genomics - International Centre for Tropical Agriculture (CIAT) – Cassava program.
- 2012-2014: **RTB Global Theme Leader** – Accelerating the development and selection of varieties with higher, more stable yield and added value (Theme 2) - CGIAR Research Program on Root, Tubers and Bananas.
- 2009-2015 **Senior Research Scientist – Group Leader** – Genetics and Genomics - International Centre for Tropical Agriculture (CIAT) – Cassava program.
- 2004-09/2009: **Research Scientist/Engineer – Team Leader**-Commonwealth Scientific and Industrial Research Organization (CSIRO) – Division of Plant Industry.

Education

- 2000: PhD in **Plant Molecular Genetics**, School of Biological Sciences, The University of Sydney (USYD)
- 1995: MSc in **Plant Cytogenetics**, Cayetano Heredia University, Lima-Peru.

Publications

- 1) SOTO, J. C., ORTIZ, J. F., PERLAZA-JIMÉNEZ, L., VÁSQUEZ, A. X., **BECERRA LOPEZ-LAVALLE, L. A.**, MATHEW, B., LÉON, J., BERNAL, A. J., BALLVORA, A. & LÓPEZ, C. E. 2015. A genetic map of cassava (*Manihot esculenta* Crantz) with integrated physical mapping of immunity-related genes. BMC Genomics, 16, 190.
- 2) AGRE, A. P., DANSI, A., RABBI, I. Y., BATTACHARGEE, R., DANSI, M., GEDIL, M., **BECERRA LOPEZ-LAVALLE, L. A.**, SANNI, A., AKOUEGNINOU, A. & AKPAGANA, K. 2015. Agromorphological Characterization of Elite Cassava (*Manihot esculenta* Crantz) Cultivars Collected in Benin. International Journal of Current Research in Biosciences and Plant Biology, 2, 1-14.
- 3) FERGUSON, M., KOGA, T. M., JOHNSON, D. A., KOGA, K. A., HIRSCH, G. N., **BECERRA LOPEZ-LAVALLE, L. A.** & MESSIER, W. 2015. Identification of genes that have undergone adaptive evolution in cassava (*Manihot esculenta*) and that may confer resistance to cassava brown streak disease. Journal of African Biotechnology, 14, 96-107.
- 4) PEÑA-VEGAS, C., STOMPH, T., VERSCHOOR, G., **BECERRA LOPEZ-LAVALLE, L. A.** & STRUIK, P. 2014. Differences in Manioc Diversity among Five Ethnic Groups of the Colombian Amazon. Diversity, 6, 792-826.
- 5) WANG, W., FENG, B., XIAO, J., XIA, Z., ZHOU, X., LI, P., ZHANG, W., WANG, Y., MØLLER, B. L., ZHANG, P., LUO, M.-C., XIAO, G., LIU, J., YANG, J., CHEN, S., RABINOWICZ, P. D., CHEN, X., ZHANG, H.-B., CEBALLOS, H., LOU, Q., ZOU, M., CARVALHO, L. J. C. B., ZENG, C., XIA, J., SUN, S., FU, Y., WANG, H., LU, C., RUAN, M., ZHOU, S., WU, Z., LIU, H., KANNANGARA, R. M., JØRGENSEN, K., NEALE, R. L., BONDE, M., HEINZ, N., ZHU, W., WANG, S., ZHANG, Y., PAN, K., WEN, M., MA, P.-A., LI, Z., HU, M., LIAO, W., HU, W., ZHANG, S., PEI, J., GUO, A., GUO, J., ZHANG, J., ZHANG, Z., YE, J., OU, W., MA, Y., LIU, X., TALLON, L. J., GALENS, K., OTT, S., HUANG, J., XUE, J., AN, F., YAO, Q., LU, X., FREGENE, M., **BECERRA LOPEZ-LAVALLE, L. A.**, WU, J., YOU, F. M., CHEN, M., HU, S., WU, G., ZHONG, S., LING, P., CHEN, Y., WANG, Q., LIU, G., LIU, B., LI, K. & PENG, M. 2014. Cassava genome from a wild ancestor to cultivated varieties. Nature Communications, 5, 1-5.

Role in RTB: Cluster co-Leader DI1.2: Next Generation Breeding of Flagship Project FP1: Discovery Enhanced genetic resources.

Name: Ismail Yusuf RABBI

Current position and affiliation: Cassava Genetics - International Institute of Tropical Agriculture (IITA) – Ibadan – Nigeria

Profile: Genetics, Plant Breeding including Genomic Selection, Phenotyping.

Employment:

- 2011-present: Scientist (Cassava Genetics), International Institute of Tropical Agriculture, Ibadan Nigeria
- 2009-2011: Postdoctoral Fellow, International Institute of Tropical Agriculture, Nairobi, Kenya.

Education:

- 2009: PhD: Population Genetics and Plant Breeding, University of Hohenheim, Stuttgart Germany
- 2005: MSc: Biotechnology, Kenyatta University, Nairobi, Kenya

Selected Recent Peer-reviewed publications:

- 1) **Rabbi, I. Y.**, Kulakow, P.A., Manu-Aduening, J.A., Dankyi, A.A., Asibuo, J.Y., Parkes, E.Y., Abdoulaye, T., Girma, G., Gedil, M.A., Ramu, P., Reyes, B., Maredia, M.K 2015. Tracking crop varieties using genotyping-by-sequencing markers: a case study using cassava (*Manihot esculenta* Crantz). *BMC Genet.* 16, 115. DOI: 10.1186/s12863-015-0273-1
- 2) **Rabbi, I.**, Hamblin, M. & Gedil, M. 2014. Genetic Mapping Using Genotyping-by-Sequencing in the Clonally Propagated Cassava. *Crop Science* 54(4):1384-1396. doi:10.2135/cropsci2013.07.0482
- 3) **Rabbi, I. Y.**, Hamblin, M.T., Lava Kumar, P., Gedil, M.A., Ikpan, A.S., Jannink, J.L., Kulakow, P.A. 2014. High-resolution mapping of resistance to cassava mosaic geminiviruses in cassava using genotyping-by-sequencing and its implications for breeding. *Virus Res.* 186, 87–96. doi:10.1016/j.virusres.2013.12.028
- 4) **Rabbi, I. Y.**, Kulembeka, H. P., Masumba, E., Marri, P. R. & Ferguson, M. 2012. An EST-derived SNP and SSR genetic linkage map of cassava (*Manihot esculenta* Crantz). *Theor. Appl. Genet.* 125(2):329-342. doi:10.1007/s00122-012-1836-4
- 5) Ly, D., Hamblin, M., **Rabbi, I.**, Melaku, G., Bakare, M., Gauch, H.G., Okechukwu, R., Dixon, A.G.O., Kulakow, P., Jannink, J.L. 2013. Relatedness and Genotype × Environment Interaction Affect Prediction Accuracies in Genomic Selection: A Study in Cassava. *Crop Sci.* 53(4): 1312–1325.
- 6) International Cassava Genetic Map Consortium (ICGMC). 2015. High-Resolution Linkage Map and Chromosome-Scale Genome Assembly for Cassava (*Manihot esculenta* Crantz) from Ten Populations. *G3 Genes|Genomes|Genetics.* 5(1):133–144 doi:10.1534/g3.114.015008
- 7) Tecle, I. Y., Edwards, J.D., Menda, N., Egesi, C., **Rabbi, I.Y.**, Kulakow, P., Kawuki, R., Jannink, J.L., Mueller, L.A. 2014. solGS: a web-based tool for genomic selection. *BMC Bioinformatics* 15, 398. doi:10.1186/s12859-014-0398-7
- 8) Hamblin, M. T. and **Rabbi, I. Y.** 2014. The Effects of Restriction-Enzyme Choice on Properties of Genotyping-by-Sequencing Libraries: A Study in Cassava (*Manihot esculenta*). *Crop Sci.* 54(6):2603-2608.

Other Evidence of Leadership, large-program management and delivery:

- **Next Generation Cassava Breeding Project:** Key member of the project leading implementation of genomic selection activities in IITA – Ibadan.
- **HarvestPlus Cassava Project:** Leading the development of molecular markers associated with increased provitamin A content and improved phenotyping method.
- **Cassava Monitoring Study:** Leading DNA-based variety identification in large-scale survey of 2500 households in Nigeria.
- **Targeted use of Genetic Diversity Project – (RTB Theme 1 and 2):** Lead implementation of the cassava project in IITA. This project is now transitioning into “FP 1: Discovery: Enhanced genetic resources” in the new RTB Project Portfolio.
- **BREAD PHENO: iPheno – High-throughput phenotyping with smart phones:** Lead App field testing and deployment with cassava breeding networks. This project will converge novel advances in image processing and machine vision to deliver transformative mobile applications through established breeder networks.

Role in RTB: Cluster co-Leader DI1.2: Next Generation Breeding of Flagship Project FP1: Discovery Enhanced genetic resources.

Name: Marc GHISLAIN

Current position and affiliation: Program Leader, International Potato Center (CIP)

Profile: Marc Ghislain is a senior biotechnologist at the International Potato Center (CIP) leading one of the 6 research programs. He chairs the institutional biosafety committee and is a member of the intellectual property committee. His educational background includes agronomy and plant molecular biology. His research scope covers the use and characterization of wild relatives, genetic mapping trait of interests, isolation of genes and alleles, and their introgression into advanced germplasm by marker-assisted selection, genomics-assisted breeding, or transgenesis for the potato and the sweetpotato crops. In Africa, he develops transgenic potato with late blight resistance, sweetpotato with virus disease and weevil resistance, and contributes to apply genomics tools for sweetpotato breeding.

Employment:

- 2014 – present: Game Changing Solutions – Program Leader, CIP, Kenya
- 2012-2014: Genomics & Biotechnology - Program Leader, CIP, Kenya
- 1999-2011: Biotechnology advisor, CIP, Peru

Education:

- 1992: Ph.D. 'Cell and Gene Biotechnology' at the Free University of Brussels, Belgium
- 1984: Eng. Agronomy at the Free University of Brussels, Belgium

Selected Recent Peer-reviewed publications:

- 1) Rukarwa, R. J., K. Prentice, M. Ormachea, J. F. Kreuze, J. Tovar, S. B. Mukasa, G. Ssemakula, R. O. M. Mwanga, and **M. Ghislain** (2013). Evaluation of bioassays for testing Bt sweetpotato events against sweetpotato weevils. *African Crop Science Journal* 21: 235-244
- 2) Rukarwa R.J., Mukasa S.B., Odongo B., Ssemakula G and **Ghislain M.** (2014). Identification of relevant non-target organisms exposed to sweetpotato weevil-resistant Bt sweetpotato in Uganda. *3 Biotech*, 4:217–226
- 3) **Ghislain, M.**, Montenegro, J. D., Juarez, H., & del Rosario Herrera, M. (2015). Ex-post analysis of landraces sympatric to a commercial variety in the center of origin of the potato failed to detect gene flow. *Transgenic research*, 24(3), 519-528.
- 4) Kyndt, T., Quispe, D., Zhai, H., Jarret, R., **Ghislain, M.**, Liu, Q., Gheysen, G., and Kreuze, J.F. (2015). The genome of cultivated sweet potato contains *Agrobacterium* T-DNAs with expressed genes: An example of a naturally transgenic food crop. *Proceedings of the National Academy of Sciences of USA*, 112(18), 5844-5849.
- 5) Orbegoza, J., Roman, M. L., Rivera, C., Gamboa, S., Tovar, J. C., Forbes, G. A., Lindqvist-Kreuzer, H., Kreuzer, J.F., & **Ghislain, M.** (2016). *Rpi-blb2* gene from *Solanum bulbocastanum* confers extreme resistance to late blight disease in potato. *Plant Cell, Tissue and Organ Culture (PCTOC)*, 1-13.
- 6) Schiek, B., Hareau, G., Baguma, Y., Medakker, A., Douches, D., Shotkoski, F., and **Ghislain, M.** (2016). Demystification of GM crop costs: releasing late blight resistant potato varieties as public goods in developing countries. *International Journal of Biotechnology in press*.

Role in RTB: Cluster Leader DI1.3: Game Changing Traits of Flagship Project FP1: Discovery Enhanced genetic resources.

Name: Mohammad Ehsan DULLOO

Current position and affiliation: Component Leader, Effective Genetic Resources Conservation and Use, Bioversity International.

Profile: Biodiversity Conservation (*in situ* and *ex situ*), plant genetic resources, crop wild relatives, genebank management, protected areas management, invasive species, island ecology, ecological restoration

Employment

- 2012-present: **Programme /Component Leader** (Conservation and availability), Bioversity International, Rome, Italy (since 2016 based in Mauritius)
- 2011-2012: **Senior Policy officer (Plant Genetic Resources)**-(P-5), FAO, Rome, Italy.
- 1999-2011: **Scientist/Senior Scientist, Agricultural Biodiversity Conservation**, Bioversity International, Nairobi/Rome, Italy.
- 1996-1999: **Plant Conservation Manager** -GEF/World Bank, Biodiversity restoration project, Mauritian Wildlife Foundation, Mauritius.

Education

- 1998: Ph.D., *Diversity and conservation of wild Coffea germplasm in the Mascarene Islands*. University of Birmingham, UK.
- 1990: M.Sc, *Conservation and Utilization of Plant Genetic Resources*, University of Birmingham, UK.

Selected recent peer-reviewed publications

- 1) Redden, R., Yadav, S.S., Maxted, N., **Dulloo, M.E.**, Guarino, L. and Smith, P. (eds) (2015) *Crop Wild Relatives and Climate Change*. Wiley-Blackwell 400 pages. ISBN: 978-1-118-85433-4 (*Book editor*)
- 2) **Dulloo, M.E.**, Hunter, D. and Leaman, D. (2014) Plant Diversity in Addressing Food, Nutrition and Medicinal Needs, IN: *Novel Plant Bioresources: Applications in Food, Medicine and Cosmetics* (ed A. Gurib-Fakim), John Wiley & Sons, Ltd, Chichester, UK. doi: 10.1002/9781118460566.ch1 (*Book Chapter*)
- 3) **Dulloo M.E.** Thormann I., Fiorino E., De Felice S., Rao V.R., and Snook L. (2013). Trends in Research using Plant Genetic Resources from Germplasm Collections: From 1996 to 2006. *Crop Science* doi: 10.2135/cropsci2012.04.0219; Posted online 15 Feb. 2013. (*Peer review journal*)
- 4) Pereira H. M., S. Ferrier, M. Walters, G. N. Geller, R. H. G. Jongman, R. J. Scholes, M., W. Bruford, N. Brummitt, S. H. M. Butchart, A. C. Cardoso, N. C. Coops, **E. Dulloo**, D.P. Faith, J. Freyhof, R. D. Gregory, C. Heip, R. Höft, G. Hurtt, W. Jetz, D. Karp, M. A., McGeoch, D. Obura, Y. Onoda, N. Pettorelli, B. Reyers, R. Sayre, J. P. W. Scharlemann, S. N. Stuart, E. Turak, M. Walpole, M. Wegmann (2013). Essential Biodiversity Variables. *Science* 339: 277-278. (*Peer review journal*)
- 5) **Dulloo M.E.** (2013). Global challenges for agricultural plant biodiversity and international collaboration. IN Normah M.N., Chin H.F, and Reed B.M. (Eds). *Conservation of tropical plant species*. Springer New York Heidelberg Dordrecht London. Chapter 19, Pp 491-510. (*Book chapter*)
- 6) Maxted N., **Dulloo M.E.**, Ford-Lloyd B.V., Frese L., Iriondo J., Pinheiro de Carvalho M. A.A., (2012). *Agrobiodiversity Conservation: Securing the diversity of Crop Wild Relatives and Landraces*. CABI Publishing, Wallingford (**Book editor**)
- 7) **Dulloo M.E.**, Hunter D. and Borelli T. (2010). Ex Situ and In Situ Conservation of Agricultural Biodiversity: Major Advances and Research Needs. *Notulae Botanicae Horti Agrobotanici Cluj* 38(2) special issue: 123-135. (*peer review journal*)

Other Evidence of Leadership, large-program management and delivery

- 2004-2011- Led major global projects – (Bioversity project on Complementary conservation strategies for PGRFA; Global programme on intermediate and recalcitrant forest tree seeds; World Bank/GEF project on biodiversity restoration)
- 2006: Zayed International Prize for the Environment in the category of “Scientific Achievements in the Environment” (www.zayedprize.org) – as part of the team (as lead author) of the Millennium Ecosystem Assessment on crop biodiversity
- 2009: Winner of World Bank Development Marketplace Award 2009 for project proposal on adapting to climate change: innovation tools to match seeds to needs of women farmers in Ethiopia.

Role in RTB: Cluster co-Leader DI1.4: Genetic diversity of Flagship Project FP1: Discovery Enhanced genetic resources.

Name: Michael ABBERTON

Current position and affiliation: Head, Genetic Resources Centre, IITA

Profile: Plant breeding, genetic resources, climate change

Employment:

- 2012-current: Head, Genetic Resources Centre, International Institute of Tropical Agriculture (IITA), Ibadan Nigeria
- 2010- 2012: Director of International Development IBERS
Chair in Public Good Plant Breeding, Aberystwyth University
- 2008-2010: Head, Crop Breeding and Genomics IBERS, Aberystwyth University
Head, Genome Diversity and Plant Breeding
- 2007-2008: Programme Leader, Plant Breeding and Genetics, Institute of Grassland and Environmental Research

Education

- 1984: BSc Hons Degree in Botany 1st Class, and D.H. Valentine Prize, University of Manchester, UK
- 1988: PhD, “Chromosome specific behaviour in an autopolyploid series”, University of Manchester, UK

Selected Recent Peer-reviewed publications:

- Istvan Nagy, Susanne Barth, Jeanne Mehenni-Ciz, Michael T Abberton, Dan Milbourne. **A hybrid next generation transcript sequencing-based approach to identify allelic and homeolog-specific single nucleotide polymorphisms in allotetraploid white clover** (2013) BMC Genomics 02/2013; 14(1):100.
- YATES, S. , SWAIN, M. , HEGARTY, M. , CHERNUKIN, I. , LOWE, M. , ALLISON, G. , RUTTINK, T. , ABBERTON, M. , JENKINS, G. , SKOT, L. (2014). DE NOVO ASSEMBLY OF RED CLOVER TRANSCRIPTOME BASED ON RNA-SEQ DATA PROVIDES INSIGHT INTO DROUGHT RESPONSE, GENE DISCOVERY AND MARKER IDENTIFICATION. BMC GENOMICS, 15, 453, 1 - 33, ISSN 1471-2164, 2014
- SHITTA, N. S. ABBERTON, M. , ADESOYE, A. I. , ADEWALE, D. B. , OYATOMI, O. (2015) ANALYSIS OF GENETIC DIVERSITY OF AFRICAN YAM BEAN USING SSR MARKERS DERIVED FROM COWPEA. PLANT GENETIC RESOURCES: CHARACTERIZATION AND UTILIZATION, PAGES 1 - 7, ISSN 1479-2621, 2015.
- **Abberton M.**, Batley J., Bentley A., Bryant J., Cai H., Cockram J., Costa de Oliveira A., Cseke L.J., Dempewolf H., De Pace C., Edwards D., Gepts P., Greenland A., Hall A.E., Henry R., Hori K., Howe G.T., Hughes S., Humphreys M., Lightfoot D., Marshall A., Mayes S., Nguyen H.T., Ogonnaya F.C., Ortiz R., Paterson A.H., Tuberosa R., Valliyodan B., Varshney R.K., Yano M. (2015). Global agricultural intensification during climate change: a role for genomics. Plant Biotechnology Journal, doi: 10.1111/pbi.12467
- Kole C., Muthamilarasan M., Henry R., Edwards D., Sharma R., **Abberton M.**, Batley J., Bentley A., Blakeney M., Bryant J., Cai H., Cakir M., Cseke L.J., Cockram J., de Oliveira A.C., De Pace C., Dempewolf H., Ellison S., Gepts P., Greenland A., Hall A., Hori K., Hughes S., Humphreys M.W., Iorizzo M., Ismail A.M., Marshall A., Mayes S., Nguyen H.T., Ogonnaya F.C., Ortiz R., Paterson A.H., Simon P.W., Tohme J., Tuberosa R., Valliyodan B., Varshney R.K., Wulschleger S.D., Yano M., Prasad M. (2015) Application of genomics-assisted breeding for generation of climate resilient crops: progress and prospects. Frontiers in Plant Science. 6(563) 1— 16

Other Evidence of Leadership, large-program management and delivery:

Delivery of plant breeding programs, large multinational projects and large UK funded projects including public-private partnerships

Role in RTB: Cluster co-Leader DI1.4: Genetic diversity of Flagship Project FP1: Discovery Enhanced genetic resources.

FP2: Productive varieties/quality seed

Name: Elmar SCHULTE-GELDERMANN

Current position and affiliation: Program Leader: CIP Strategic Objective 3-Seed Potato for Africa

Profile: Seed systems, rapid propagation technologies, seed degeneration, germplasm evaluation, integrated pest and disease management, soil fertility and soil health management, project and program management

Employment:

- 2014-present: International Potato Center: Program Leader: CIP Strategic Objective 3-Seed Potato for Africa;
- 2012 -2014: International Potato Center: Potato Science Leader- SSA;
- 2009 -2012: International Potato Center: *Integrated Crop Management Scientist*
- 2003-2009: Researcher at the departments of “Plant Protection” and “Organic Farming and Cropping Systems”, at the *University of Kassel, Germany*.

Education:

- 2008: PhD, University Kassel, Witzenhausen. Management approaches in organic potato and tomato production -Interactive impacts of agronomic measures on plant nutrition, plant health and yield.
- 2003: Master of Science (Dipl. Agraringenieur), University of Kassel, Witzenhausen. Management strategies to control late blight studies in organic agricultural science.

Selected Recent Peer-reviewed publications:

- 1) **E. Schulte-Geldermann**, P.R. Gildemacher and P. Struik, 2015: Improving Seed Health and Seed Performance by Positive Selection in Three Kenyan Potato Varieties. In: *Potato and Sweetpotato in Africa: Transforming the Value Chains for Food and Nutrition Security*, p.. 254-260
- 2) P. Demo, B. Lemaga, R. Kakuhenzire, S. Schulz, D. Borus, I. Barker, G. Woldegiorgis, M.L. Parker and **E. Schulte-Geldermann**. 2015: Strategies to Improve Poor Seed Potato Quality and Supply in Sub-Saharan Africa: Experience from Interventions in Five Countries In: *Potato and Sweetpotato in Africa: Transforming the Value Chains for Food and Nutrition Security*, p. 155-167
- 3) Okello, J.J., Kwikiriza, N., Kakuhenzire, R., Parker, M., **Schulte-Geldermann, E.** and Pambo, K., 2015. Micro and meso-level issues affecting potato production and marketing in the tropical highlands of Sub-Saharan Africa: The known and the unknowns (No. 205464). *Agricultural and Applied Economics Association*.
- 4) Nopsa, J.F., Xing, Y., Andrade-Piedra, J., Beed, F., Bloome, G., Carvajal Yepes, M., Forbes, G., Kreuze, J., Kroschel, J., Legg, J., Parker, M., **Schulte-Geldermann, E.** Garret K.A., 2014. Global crop connectivity as a risk factor for pathogen and pest invasion: the case of banana, cassava, potato, and sweetpotato. In *PHYTOPATHOLOGY* (Vol. 104, No. 11, pp. 51-51).
- 5) Smith, J.J., Coyne, D. and **Schulte-Geldermann, E.**, 2013. 8 Challenges for the improvement of seed systems for vegetatively propagated crops in Eastern Africa. *Agro-Ecological Intensification of Agricultural Systems in the African Highlands*, p.105.

Other Evidence of Leadership, large-program management and delivery:

At CIP Principal Investigator (PI) or co-PI of 11 bilaterally funded projects with a value of \$US 12m covering 8 sub-Saharan Africa countries, reaching more than 250,000 farming households. Scientific supervision to projects inclusive of significant contribution to successful proposal development to 12 further projects with a value of \$US 17.5m. Further to this I am member of the CIP Executive Committee (2016), the Science Leader Team (2014 - present) and the SSA Regional Management Team (2014 - present).

Role in RTB: Flagship Leader FP2: Adapted productive varieties and quality seed of RTB crops.

Name: Jorge ANDRADE-PIEDRA

Current position and affiliation: Potato Seed and Late Blight Specialist, International Potato Center (CIP)

Profile: Epidemiologist, International Potato Center.

Employment:

- 2013– Present: Potato Seed and Late Blight Specialist and Global Leader of Theme 4 (High Quality Planting Material) for the CGIAR Research Program on Roots, Tubers and Bananas. International Potato Center (Lima, Peru).
- 2012–2013: Project Coordinator ISSAndes: Strengthening pro poor agricultural innovation for food security in the Andean region (regional project in Bolivia, Ecuador and Peru). International Potato Center (Quito, Ecuador).
- 2006-2011: Project Coordinator. InnovAndes: Strengthening capacity for innovation and poverty alleviation in the Andes (regional project in Bolivia, Ecuador and Peru). International Potato Center (Quito, Ecuador).
- 2005-2006: Post-doctorate Associate. Epidemiology of potato late blight (*Phytophthora infestans*) in the tropical highlands, training of scientists and extension workers. International Potato Center (Quito, Ecuador).

Education:

- 2004, Ph.D. in Plant Pathology (minors in Epidemiology and International Agriculture). Cornell University (Ithaca, New York, USA)
- 2000, M.Sc. in Plant Pathology. Universidad Nacional Agraria La Molina (Lima, Peru).

Selected Recent Peer-reviewed publications:

- 1) Thomas-Sharma, S., Abdurahman, A., Ali, S., **Andrade-Piedra**, J.L., Bao, S., Charkowski, A.O., Crook, D., Kadian, M., Kromann, P., Struik, P.C., Torrance, L., Garrett, K.A., and Forbes, G.A. 2015. Seed degeneration in potato: The need for an integrated seed health strategy to mitigate the problem in developing countries. *Plant Pathology* 65:3-16 (doi: 10.1111/ppa.12439).
- 2) Mateus-Rodriguez, J.R., De Haan, S., **Andrade-Piedra**, J.L., Maldonado, L., Hareau, G., Barker, I., Chuquillanqui, C., Otazú, V., Frisnacho, R., Bastos, C., Pereira, A.S., Medeiros, C.A., Montesdeoca, F., and Benitez, J. 2013. Technical and economic analysis of aeroponics and other systems for potato mini-tuber production in Latin America. *American Journal of Potato Research* 90:357-368 (doi: 10.1007/s12230-013-9312-5)
- 3) Kromann, P., Pérez, W., Taipe, A., Schulte-Geldermann, E., **Andrade-Piedra**, J. and Forbes, G. 2012. Use of phosphonate to manage foliar potato late blight in developing countries. *Plant Disease* 96:1008-1015.
- 4) Horton, D., Thiele, G., Oros, R., **Andrade-Piedra**, J., Velasco, C., and Devaux, D. 2011. Knowledge management for pro-poor innovation: the Papa Andina case. *Knowledge Management for Development Journal* 7:65-83.
- 5) Blandón-Díaz, J. U., Forbes, G.A., **Andrade-Piedra**, J.L., and Yuen, J. E. 2011. Assessing the adequacy of the simulation model LATEBLIGHT under Nicaraguan conditions. *Plant Disease* 95:839-846.
- 6) Thiele, G., Devaux, A., Reinoso, R., Pico, H., Montesdeoca, F., Pumisacho, M., **Andrade-Piedra**, J.L., Velasco, C., Flores, P., Esprella, R., Thomann, A., Manrique, K., and Horton, D. 2011. Multi-stakeholder platforms for linking small farmers to value chains: evidence from the Andes. *International Journal of Agricultural Sustainability* 9:423-433.
- 7) Cavatassi, R., Gonzalez, M., Winters, P., **Andrade-Piedra**, J.L., Espinosa, P. and Thiele, G. 2011. Linking Smallholders to the New Agricultural Economy: the case of the Plataformas de concertación in Ecuador. *Journal of Agricultural Economics* 47:1545-1573.

Other Evidence of Leadership, large-program management and delivery:

Part of the Papa Andina team in Bolivia, Ecuador and Peru from 2005 to 2013. Main results are described [here](#).

Role in RTB: Cluster Leader CC2.1: Quality seeds and access to improved varieties of Flagship Product 2: Productive varieties and quality seed.

Name: Inge VAN DEN BERGH

Current position and affiliation: Senior scientist, Bioversity International

Profile:

- Participatory multi-location evaluation and selection of banana cultivars for more sustainable production and food systems
- Evaluation and promotion of banana diversity to reduce vitamin A deficiency
- Coordination of banana networking and knowledge sharing platform ProMusa (www.promusa.org)
- 18 years of progressively responsible experience in project management

Employment:

- 2014 – present: Senior Scientist and ProMusa Coordinator, Bioversity International, Belgium
- 2007 – 2013: Scientist and ProMusa Coordinator, Bioversity International, France
- 2002 – 2006: Associate Scientist, Technology Transfer, VVOB-INIBAP, Philippines
- 1997 – 2001: Associate Expert, Nematology, VVOB-INIBAP, Vietnam

Education:

- 2002: PhD in Applied Biological Sciences, Catholic University of Leuven, Belgium
- 1997: Agronomic Engineer, Phytotechnics - Tropical Agriculture, Catholic University of Leuven, Belgium

Selected Recent Peer-reviewed publications:

- 1) Ekesa, B, Nabuuma, D, Blomme, G, and **Van den Bergh, I.** 2015. Provitamin A carotenoid content of unripe and ripe banana cultivars for potential adoption in Eastern Africa. *Journal of Food Composition and Analysis* 43:1-6.
- 2) M. Kamira, R.J. Crichton, J.-P. Kanyaruguru, P.J.A. van Asten, G. Blomme, J. Lorenzen, E. Njukwe, **I. Van den Bergh**, E. Ouma, and P. Muchunguzi. 2013. Agronomic evaluation of common and improved dessert banana cultivars at different altitudes across Burundi. Chapter 5. p.37-47. In: *Banana Systems in the Humid Highlands of Sub-Saharan Africa - Enhancing Resilience and Productivity*. CABI.
- 3) Herradura L.E., Lobres M.A.N., De Waele D., Davide R.G. and **Van den Bergh I.** 2012. Yield response of four popular banana varieties from southeast Asia to infection with a population of *Radopholus similis* from Davao, Philippines. *Nematology* 14(7): 889-897.
- 4) Staver C., **Van den Bergh I.**, Karamura E., Blomme G. and Lescot T. 2010. Targeting actions to improve the quality of farmer planting material in bananas and plantains – building a national priority-setting framework. *Tree and Forestry Science and Biotechnology* 4 (Special Issue 1): 1-10.
- 5) Davey M.W., **Van den Bergh I.**, Markham R., Swennen R. and Keulemans J. 2009. Genetic variability in *Musa* fruit provitamin A carotenoids and mineral micronutrient contents. *Food Chemistry* 115: 806-813.
- 6) Gervacio D.D., Dawi N.M., Fabregar E.G., Molina A.B. and **Van den Bergh I.** 2008. Agronomic performance of selected local and introduced banana cultivars (*Musa* spp.) under commercial management practices in Davao, Philippines. *Philippine Journal of Crop Science* 33(3): 71-81.

For more publications: see <http://www.musalit.org/index.php?nomAuth=Van%20den%20Bergh,%20I>

Other Evidence of Leadership, large-program management and delivery: Banana Science Domain leader and RTB focal point for Bioversity; Coordinator of International *Musa* Testing Program; Coordinator of ProMusa global knowledge sharing network; Leader of work package on cultivar evaluation of BMGF grant on breeding East African highland bananas

Role in RTB: Cluster co-Leader BA2.2: Matching banana cultivars and hybrids with farmers', consumers' and markets' needs, for more sustainable food and production systems of Flagship Product 2: Productive varieties and quality seed.

Name: Rony, SWENNEN

Current position and affiliation: Banana breeder (IITA) and banana genetic resources (Bioversity International), professor KU Leuven University, Belgium

Profile: breeding, physiology, molecular biology, gene discovery, in vitro culture, agronomy, international varietal testing

Banana and plantain breeding since 1979 resulting in the King Badouin Award for IITA in 1994 for the development of black Sigatoka resistant plantains and a postal stamp in Nigeria. His banana germplasm collecting resulting in the foundation of the International Transit Collection creation in 1985, now under Bioversity International. He was pivotal in the securing of the International status of Bioversity International in Belgium. He developed the first transgenic bananas in the early 1990s. Collaborative research led to large scale impact on Tanzania on more than 0.5 mio banana farmers (Cooperation Excellence Award in November 2010 given by The United Nations' annual Global South-South Development Expo), in India (Kadali Puraskar in 2009, in "recognition of his vision and services rendered for the improvement of banana and plantain") and Pisang Raja Award in 2000 given by all the national banana programs in Asia, in recognition of 21 years of outstanding accomplishment in banana breeding and biotechnology, and also for profound contribution to INIBAP and ASPNET, and in Nigeria with a Chieftancy 1991 for contributions in South East Nigeria.

Employment:

- 2013-to date: Banana breeder (IITA) and banana genetic resources (Bioversity International), professor KU Leuven University, Belgium
- 1990-2013: professor KU Leuven University, Belgium and honorary research fellow Bioversity International
- 1982-1990: plantain agronomist/breeder at IITA
- 1979-1982: FAO plantain agronomist/breeder based at IITA

Education:

- 1984: PhD, Plantain physiology, KU Leuven University, Belgium
- 1978: MSc, Plant physiology and soil science, KU Leuven University, Belgium

Selected Recent Peer-reviewed publications:

- 1) Janssens, S.B., Vandeloof, F., De Langhe, E., Verstraete, B., Smets, E., Van den houwe, I., and **Swennen, R.** 2015. Evolutionary dynamics and biogeography of Musaceae reveal a correlation between the diversification of the banana family and the geological and climatic history of Southeast Asia. *New Phytologist*. doi: 10.1111/nph.13856
- 2) Cizkova, J., Hribova, E., Christelova, P., Van den houwe, I., Hakkinen, M., Roux, N., **Swennen, R.**, and Dolezel, J. 2015. Molecular and cytogenetic characterization of wild *Musa* species. *PLoS ONE*, 10(8), e0134096. <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0134096>
- 3) Vanhove, A.-C., Vermaelen, W., **Swennen, R.**, and Carpentier, S. 2015. A look behind the screens: Characterization of the HSP70 family during osmotic stress in a non-model crop. *Journal of Proteomics*, 119, 10-20. 10.1016/j.jprot.2015.01.014. <http://www.sciencedirect.com/science/article/pii/S1874391915000238>
- 4) Hoelscher, D., Suganthagunthalam, D., Alexandrov, T., Becker, M., Bretschneider, T., Buerkert, A., Crecelius, A.C., De Waele, D., Elsen, A., Heckel, D.G., Heklau, H., Hertweck, C., Kai, M., Knop, K., Krafft, C., Maddula, R.K., Matthäus, C., Popp, J., Schneider, B., Schubert, U.S., Sikora, R.A., Svatos, A., and **Swennen, R.** 2014. Phenalenone-type phytoalexins mediate resistance of banana plants (*Musa* spp.) to the burrowing nematode *Radopholus similis*. *PNAS*, 111(1), 105-110. <http://www.pnas.org/content/111/1/105>
- 5) Ortiz, R., and **Swennen, R.** 2014. From crossbreeding to biotechnology-facilitated improvement of banana and plantain. *Biotechnology Advances*, 32, 158-169. <http://dx.doi.org/10.1016/j.biotechadv.2013.09.010>

Other Evidence of Leadership, large-program management and delivery:

- Leads the Bill & Melinda Gates project "Improvement of banana for smallholder farmers in the Great Lakes Region of Africa", implemented in Uganda and Tanzania
- Lead the banana research at IITA from 1979-1990.
- Co-Lead the Belgian Technical Cooperation project "PROPAGATION AND DIFFUSION OF SUPERIOR BANANA PLANTS, 1994-2012, implemented over the entire Kagera region, NW-Tanzania
- Lead the operations of the International Transit Centre of Bioversity International from 1990 till 2012.

Role in RTB: Cluster co-Leader BA2.2: Matching banana cultivars and hybrids with farmers' consumers' and markets' needs, for more sustainable food and production systems of Flagship Product 2: Productive varieties and quality seed.

Name: Hernán CEBALLOS

Current position and affiliation: Cassava Breeder, CIAT

Profile: Plant Breeding and Quantitative Genetics; Maize and cassava breeding; Root quality traits; Resistance to pest and diseases; Screening/developing for new starch functional properties; Breeding for abiotic stresses.

Education:

- 1980: **Ing. Agrónomo**. Agronomy and Crop Production, Universidad Nacional de Córdoba, Argentina.
- 1987: **Ph.D.**, Plant Breeding Cornell University, Ithaca, New York, USA

Employment

- **1999 - present:** Cassava breeder and Leader of Cassava Project (since 1999 through 2012) at the International Center for Tropical Agriculture (CIAT). Cali, Colombia.
- **1994–2007:** Associate Professor, Universidad Nacional de Colombia (Palmira Campus) and Plant Breeding Graduate School Coordinator. Director of M.S. and Ph.D. theses, lecturer of three graduate courses: **1) Quantitative Genetics; 2) Breeding for Biotic and Abiotic Stresses and 3) Methods of Plant Breeding.**
- **1987-1994:** Maize breeder at International Maize and Wheat Improvement Center (CIMMYT), in Mexico and Colombia.

Selected Recent Peer-reviewed publications

- 1) Morante, N., **H. Ceballos**, T. Sánchez, A. Rolland-Sabaté, F. Calle, C. Hershey, O. Gibert, and D. Dufour. 2016. Discovery of new spontaneous sources of amylose-free cassava starch and analysis of their structure and techno-functional properties. Accepted for publication in *Food Hydrocolloids*.
- 2) **Ceballos, H.**, R.S. Kawuki, V.E. Gracen, G.C. Yencho and C.H. Hershey. 2015. Conventional breeding, marker assisted selection, genomic selection and inbreeding in clonally propagated crops: A case study for cassava. **Theoretical and Applied Genetics** 9:1647-1667.
- 3) Sánchez, T., **H. Ceballos**, D. Dufour, D. Ortiz, N. Morante, F. Calle, T. Zum Felde, and F. Davrieux. 2014. Carotenoids and dry matter Prediction by NIRS and hunter color in fresh cassava roots. **Food Chemistry** 151: 444–451.
- 4) **Ceballos, H., N. Morante, T. Sánchez, D. Ortiz, I. Aragón, A.L. Chávez, M. Pizarro, F. Calle, and D. Dufour. 2013. Rapid cycling recurrent selection for increased carotenoids content in cassava roots. Crop Science 53: 2342-2351.**
- 5) Sánchez, T., D. Dufour, J.L. Moreno, M. Pizarro, I. Arango, M. Domínguez, and **H. Ceballos**. 2013. Changes in extended shelf life of cassava roots during storage in ambient conditions. **Postharvest Biology and Technology** 86: 520–528.
- 6) **Ceballos, H., C. Hershey and L.A. Becerra-López-Lavalle. 2012. New approaches to cassava breeding. Plant Breeding Reviews 36:427-504.**
- 7) Welsch, R., J. Arango, C. Bär, B. Salazar, S. Al-Babili, J. Beltrán, P. Chavarriaga, **H. Ceballos**, J. Tohme and P. Beyer. 2010. Provitamin A - accumulation in cassava (*Manihot esculenta*) roots driven by a single nucleotide polymorphism in a phytoene synthase gene. **The Plant Cell** 22:3348-3356.

Other Evidence of Leadership:

1) Chickpea, maize, and cassava breeding 2) Population improvement and development of maize inbred lines; 3) Advising national research programs from Africa, Asia and America in their breeding activities; 4) Basic research on the inheritance of different traits; 5) Management of field activities; 6) Directing M.S. and Ph.D. student theses; 7) Teaching graduate courses on Quantitative Genetics, Methods of Plant Breeding and Breeding for Biotic and Abiotic Stresses at National University of Colombia, University of Ghana, University of Kwazulu-Natal (South Africa), Makerere University (Uganda); 8) Leader of a research project involving the management of about 25 people; 9) Search for financial resources, writing research proposals and reports; 10) Breeding for high value traits in cassava (nutritional quality and starch functional properties); 11) Member of scientific advisory committees in large research projects; 12) National Award on the Technological Innovation. Awarded by the Colombian Association for the Advancement of Science in 2008.

Role in RTB: Support Cluster Leader CA2.3 Added value cassava varieties in Flagship Project 2: Productive varieties and quality planting material.

Name: Monica L. PARKER

Current position and affiliation: Scientist, Seed Potato for Africa Program, International Potato Center

Profile: Program leadership for Seed Potato for Africa (SPA) to support program growth and country projects. Relevant experience includes strong background in plant pathology, disease diagnostics and horticulture, setting up sites for seed multiplication of horticultural crops, and supervising staff and student research related to seed systems and pathology.

Employment

- 2013-present: Scientist, International Potato Center, Kenya
- 2012-2013: Post-Doctoral Fellow, University of Guelph, Canada
- 2006-2007: Program Coordinator, Rwanda Flora Sarl, Rwanda
- 2003-2005: Technical Assistant, Ministry of Agriculture, Rwanda.

Education

- 2012: PhD in Plant Pathology, University of Guelph, ON, Canada.
- 1999: MSc in Plant Pathology, Simon Fraser University, BC, Canada.

Selected Recent Peer-reviewed publications

- 1) Low, J., Nyongesa, M., Quinn, S. and **Parker, M.** (Eds) 2015. Potato and Sweetpotato in Africa – Transforming the Value Chains for Food and Nutrition Security, CAB International, Oxfordshire.
- 2) Demo, P., Lemaga, R., Kakuhenzire, R., Schulz, S., Borus, D., Barker, I., Woldegiorgis, G., **Parker, M.L.** and Schulte-Geldermann, E. 2015. Strategies to Improve Seed Potato Quality and Supply in Sub-Saharan Africa: Experience from Interventions in Five Countries. In: Low, J., Nyongesa, M., Quinn, S. and Parker, M. (Eds) *Potato and Sweetpotato in Africa – Transforming the Value Chains for Food and Nutrition Security*.
- 3) Broders, K. D., **Parker, M.L.**, Melzer, M. S., Boland G. J. 2014. Phylogenetic diversity of *Rhizoctonia solani* associated with canola and wheat in Alberta, Manitoba, and Saskatchewan. *Plant Disease* 98:1695-1701.
- 4) **Parker, M.L.**, McDonald, M.R., and Boland, G.J. 2014. Assessment of spatial distribution of ascospores of *Sclerotinia sclerotiorum* for regional disease forecasting in carrots. *Can J Plant Pathology* 36:438-446.
- 5) **Parker, M.L.**, McDonald, M.R., and Boland, G.J. 2014. Evaluation of air sampling and detection methods to quantify airborne ascospores of *Sclerotinia sclerotiorum*. *Plant Disease* 98:32-42.
- 6) McDonald, M.R., Gossen, B.D., Kora, C., **Parker, M.**, and Boland, G.J. 2013. Using crop canopy modification to manage plant diseases. *European J Plant Pathology* 135:581-593.

Other Evidence of Leadership, large-program management and delivery

Project Leader: Accelerated Value Chain Development Project: Roots Crops Component. Funding: USAID. Budget: USD 4.2 million. Partners: Farm Input Promotions Africa, Kenya Agriculture and Livestock Research Organization, and county governments and extension. Currently rolling out the project in mobilization phase.

SPA program support: manage awareness creation and fundraising for target SPA countries, and provide program support to country interventions in Tanzania, Mozambique, Malawi and Rwanda.

Project Leader: Results Based Management pilot for PO2.4. Outcome was to clearly identify and start addressing program support needs with the goal to consolidate and analyze outputs, outcomes and impact from country interventions to the programmatic level. Developed reporting templates with goal to integrate into M&E platform to manage data and analyze program progress beyond project level.

Role in RTB: Cluster Leader of PO2.4: Seed Potato for Africa of Flagship Project 2: Productive varieties and quality seed.

Name: Gregory FORBES

Current position and affiliation: Program Leader, 'Agile potato for Asia', International Potato Center

Profile: More than 25 years of research on potato crop protection and project management, areas of expertise include plant disease epidemiology, potato diseases and seed quality in RTB and capacity development.

Employment:

- 1988-present: Program Leader, plant pathologist, International Potato Center, Lima Peru
- 1986-1988: Postdoctoral researcher, Institut National de la Recherche Agronomique, Montpellier, France

Education:

- 1984: M.Sc. in Plant Pathology, Texas A&M University, USA
- 1986: PhD in Plant Pathology, Texas A&M University, USA

Selected Recent Peer-reviewed publications:

- 1) Goss, Erica M., Javier F. Tabima, David EL Cooke, Silvia Restrepo, William E. Fry, **Gregory A. Forbes**, Valerie J. Fieland, Martha Cardenas, and Niklaus J. Grünwald. 2014. "The Irish Potato Famine Pathogen *Phytophthora Infestans* Originated in Central Mexico rather than the Andes." *Proceedings of the National Academy of Sciences* 111 (24): 8791–96.
- 2) Lindqvist-Kreuze, Hannele, Manuel Gastelo, Willmer Perez, **Gregory A. Forbes**, David de Koeper, and Merideth Bonierbale. 2014. "Phenotypic Stability and Genome-Wide Association Study of Late Blight Resistance in Potato Genotypes Adapted to the Tropical Highlands." *Phytopathology* 104 (6): 624–33.
- 3) Njoroge, A. W., G. Tusiime, **G. A. Forbes**, and J. E. Yuen. 2015. "Displacement of US-1 Clonal Lineage by a New Lineage of *Phytophthora Infestans* on Potato in Kenya and Uganda." *Plant Pathology*, September, n/a – n/a. doi:10.1111/ppa.12451.
- 4) Perez, Willmer, Miriam Ñahui, David Ellis, and **Gregory Forbes**. 2014. "Wide Phenotypic Diversity for Resistance to *Phytophthora Infestans* Found in Potato Landraces from Peru." *Plant Disease* 98 (11): 1530–33.
- 5) Pérez, W., M. Valverde, M. Barreto, J Andrade Piedra, and **G Forbes**. 2015. "Pests and Diseases Affecting Potato Landraces and Bred Varieties Grown in Peru under Indigenous Farming System." *Revista Latinoamericana de La Papa* 19 (2): 31–43.
- 6) Sparks, Adam H., **Gregory A. Forbes**, Robert J. Hijmans, and Karen A. Garrett. 2014. "Climate Change May Have Limited Effect on Global Risk of Potato Late Blight." *Global Change Biology* 20 (12): 3621–31.
- 7) Thomas-Sharma, S.; Abdurahman, A.; Ali, S.; Andrade-Piedra, J.L.; Bao, S.; Charkowski, A.O.; Crook, D.; Kadian, M.; Kromann, P.; Struik, P.C.; Torrance, L.; Garrett, K.A.; Forbes, G.A. 2016. "Seed Degeneration in Potato: The Need for an Integrated Seed Health Strategy to Mitigate the Problem in Developing Countries." *Plant Pathology* 65(1): 3–16

Other Evidence of Leadership, large-program management and delivery:

- Coordinator - Global Initiative on Late Blight 2003 – 2010; organized 3 international workshops; managed scholarship and small grant fund.
- Leader - RTB degeneration project 2012 – present; managed project, organized workshops, created data and communications structures
- Leader 'Asia Potato Program' CIP 2014 – present; developed business plan, manage science

Role in RTB: Cluster Leader PO2.5: Agile potato for Asia of Flagship Project 2: Productive Varieties and Quality Seed.

Name: Wolfgang GRÜNEBERG

Current position and affiliation: Sweetpotato Breeder and Geneticist

Profile: Plant Breeding, Quantitative Genetics and Selection Theory, Sweet potato, Yam Bean, Canola, and Wheat Breeding.

Employment:

- 2014-current: Scientific employee at the International Potato Center (CIP) as sweetpotato breeder and geneticist leading the global sweetpotato breeding program with breeding platforms in Peru, West Africa (Benin), East Africa (Uganda), and southern Africa (Mozambique).
- 2003-2004: Scientific employee for the International PhD program for Agricultural Sciences at Göttingen aiming at an association of the Universities Göttingen and Santa Clara / Cuba, long term lectureship for (i) Computer facilitated courses in statistics and (ii) Crop Evolution and development of breeding populations.
- 2001-2003: Scientific employee at the Institute for Biometry and Population Genetics at the University Gießen / Germany) – Office at the Institute of Agronomy and Plant Breeding University / Göttingen. Tasks: Estimation of variance components of GxE interactions, GCA and SCA Variances as well as model calculations and simulation studies to optimise and compare line and hybrid canola breeding systems for the KWS Saat AG – research project: hybrid rape seed breeding.
- 1997–2000: Scientific employee at the Institute of Agronomy and Plant Breeding (University Göttingen/ Germany). Tasks: leading the working group genetic resources within the frame of the DFG projects, Be1854/4-1, Be1854/4-2 und Be1854/4-3: Consideration of several traits in recurrent improvement of breeding populations by computer simulations and development of “Pre-breeding” populations for legume root crops.

Education:

- 1993: PhD, Plant Breeding, University of Hannover, Faculty of Horticulture, Germany
- 1987: Agronomist (degree equivalent to MSc), University Göttingen, Germany

Selected Recent Peer-reviewed publications: (list 5-7 relevant publications as bullets; authors first, year of publication, title of article, journal reference and volume/page number).

1. Grüneberg W.J., D. Ma, R.O.M. Mwanga, E.E. Carey, K. Huamani, F. Diaz, R. Eyzaguirre, E. Guaf, M. Jusuf, A. Karuniawan, K. Tjintokohadi, Y.-S. Song, S.R. Anil, M. Hossain, E. Rahaman, S.I. Attaluri, K. Somé, S.O. Afuape, K. Adofo, E. Lukonge, L. Karanja, J. Ndirigwe, G. Ssemakula, S. Agili, J.M. Randrianaivoarivony, M. Chiona, F. Chipungu, S.M. Laurie, J. Ricardo, M. Andrade, F. Rausch Fernandes, A.S. Mello, M.A. Khan, D.R. Labonte, and G.C. Yencho. 2015. Advances in sweetpotato breeding from 1992 to 2012. In: Potato and Sweetpotato in Africa – Transforming the Value Chains for Food and Nutrition Security (Low J., M. Nyongesa, S Quinn, and M. Parker, Eds.) CAB International, pp. 3-68.
2. Grüneberg W.J., Mwanga R., Andrade M. and Espinoza J., 2009. Selection methods Part 5: Breeding clonally propagated crops. In: S. Ceccarelli, E.P. Guimarães, E. Weltzien (eds) Plant breeding and Farmer Participation, 275 – 322.
3. Zanklan, A. S., S. Ahouangonou, H.C. Becker, E. Pawelzik, and W.J. Grüneberg. 2007. Evaluation of the Storage-Root-Forming Legume Yam bean (*Pachyrhizus* spp) under West African Conditions. Crop Science, Vol. 47, 1934 – 1946.
4. Grüneberg W.J., K. Manrique, Z. Dapeng, M. Hermann. 2005. Genotype x Environment Interactions for a Diverse Set of Sweetpotato Clones Evaluated across Varying Ecogeographic Conditions in Peru. Crop Science, Vol. 45, 2160 – 2171.
5. Grüneberg W.J., E. Abidin, P. Ndolo, C.A. Pereira, M. Hermann. 2004. Variance component estimations and allocation of resources for breeding sweetpotato under East African conditions. Plant Breeding Vol. 123, 311 – 315

Other Evidence of Leadership, large-program management and delivery: Leading the sweetpotato breeding team within the SASHA project. Leading the project: Enhancing the nutrient-rich Yam Bean (*Pachyrhizus* spp.) to improve food quality and availability and sustainability of farming systems in Central- and West Africa” budget 4.7 Mio EURO.

Role in RTB: Cluster Leader 2.6: User preferred sweetpotato varieties and seed technologies of Flagship Project 2: Productive varieties and quality seed.

FP3: Resilient crops

Name: James LEGG

Current position and affiliation: Senior Scientist, IITA, Dar es Salaam, Tanzania

Profile:

- Research for development primarily on cassava virus diseases and their vectors; wide range of field, screenhouse and laboratory-based approaches involving studies of virus-vector interactions, virus characterization, epidemiology, molecular ecology, bioinformatics, biological control, IPM, seed systems.
- Leadership of bilateral projects, student supervision and working with a diverse range of governmental, NGO and private sector partners. Most of the work is based in East, Southern and Central Africa, but strong research linkages have been built up over time with a global network of research partners.
- Senior mentoring role currently supervising 1 post-doctoral fellow, 5 PhD and 5 MSc students.

Employment:

- 2008-2015: Senior Scientist, IITA, Dar es Salaam, Tanzania
- 2000-2008: Senior Scientist, NRI/IITA, Dar es Salaam, Tanzania
- 1998-1999: Associate Scientist, IITA, Kampala, Uganda
- 1995-1997: Post-doctoral Fellow, IITA, Kampala, Uganda

Education:

- 1995: PhD, Whiteflies and geminiviruses, University of Reading, United Kingdom.
- 1989: MSc, Crop Protection, University of Reading, United Kingdom.

Selected Recent Peer-reviewed publications: (list 5-7 relevant publications as bullets; authors first, year of publication, title of article, journal reference and volume/page number).

- 1) **Legg, J. P.**, Lava Kumar, P., Makesh Kumar, T., Ferguson, M., Kanju, E., Ntawuruhunga, P., Tripathi, L. and Cuellar, W. (2015). Cassava virus diseases: biology, epidemiology and management. *Advances in Virus Research*. 91, 85-142. DOI: 10.1016/bs.aivir.2014.10.001.
- 2) Patil B. L., **Legg, J. P.**, Kanju, E. and Fauquet, C. M. (2015). Cassava brown streak disease: A threat to food security in Africa. *Journal of General Virology*. DOI: 10.1099/jgv.0.000014.
- 3) **Legg, J. P.**, Sseruwagi, P., Boniface, S., Okao-Okuja, G., Shirima, R., Bigirimana, S., Gashaka, G., Herrmann, H. - W., Jeremiah, S. C., Obiero, H. M., Ndyetabula, I., Tata-Hangy, W., Masembe, C. and Brown, J. K. (2014). Spatio-temporal patterns of genetic change amongst populations of cassava *Bemisia tabaci* whiteflies driving virus pandemics in East and Central Africa. *Virus Research* 186, 61-75. <http://dx.doi.org/10.1016/j.virusres.2013.11.018>.
- 4) **Legg, J. P.**, Somado, E. A., Barker, I., Beach, L., Ceballos, H., Cuellar, W., Elkhoury, W., Gerling, D., Helsen, J., Hershey, C., Jarvis, A., Kulakow, P., Kumar, L., Lorenzen, J., Lynam, J., McMahon, M., Maruthi, G., Miano, D., Mtunda, K., Ntawuruhunga, P., Okogbenin, E., Pezo, P., Terry, E., Thiele, G., Thresh, M., Wadsworth, J., Walsh, S., Winter, S., Tohme, J., & Fauquet, C. (2014). A global alliance declaring war on cassava viruses in Africa. *Food Security* 6, 231-248.
- 5) **Legg, J. P.** (2012). Cassava Diseases: Ecology and Control. In *Encyclopedia of Pest Management*. Taylor and Francis, London, UK. DOI: 10.1081/E-EPM-120041170.

Other Evidence of Leadership, large-program management and delivery:

Led a regional program on cassava mosaic disease mitigation for ten years from 1999 to 2008.
Managed large components of multi-partner projects tackling cassava viruses from 2006 to 2012.
Co-ordinated seed systems work of the BMGF-funded SCP project from 2013 to present.

Role in RTB: Flagship Leader 3: Resilient Crops, RTB Center Focal Point & former Leader of Theme 3: Pests and Diseases (2014-2015).

Name: Guy BLOMME

Current position and affiliation: Scientist, Integrated Banana Systems, Bioversity International, Addis Ababa Office, c/o ILRI, P.O.Box 5689, Addis Ababa, Ethiopia, Email G.Blomme@CGIAR.org

Profile:

Plant pathology, plant protection, disease epidemiology, integrated pest and disease management, integrated crop management, plant bacterial diseases.

Employment:

- 2008-current: Scientist Integrated Banana Systems, *Musa* IPM, germplasm and agronomy, Bioversity International, Uganda and Ethiopia.
- 2000–2007: VVOB Associate Expert; Assistant of the INIBAP (*International Network for the Improvement of Banana and Plantain*) regional coordinator for east and southern Africa. Bioversity International, Uganda.
- 1995-1999: VVOB Associate Expert and PhD student, Plantain agronomy and physiology, IITA High Rainfall station at Onne, south-eastern Nigeria.

Education:

- 2000: PhD, Agronomy, nematology and plant physiology, K.U. Leuven (Catholic University of Leuven), Belgium.
- 1994: MSc, Agroforestry, Ecole Supérieure d'Agronomie Tropicale (Tropical Forestry), ENGREF (Ecole Nationale des Eaux et Forêts et du Génie Rural), Montpellier, France.
- 1991: MSc, Nematology, K.U.Leuven, Leuven, Belgium.

Selected Recent Peer-reviewed publications:

- 1) Niyongere, C., P. Lepoint, T. Losenge, **G. Blomme** and E.M. Ateka 2015. TOWARDS UNDERSTANDING THE DIVERSITY OF BANANA BUNCHY TOP VIRUS IN THE GREAT LAKES REGION OF AFRICA. *African Journal of Agricultural Research* 10(7): 702-709.
- 2) Stainton, Daisy, Darren P. Martin, Brejnev M. Muhire, Samiuela Lolohea, Mana'ia Halafihi, Pascale Lepoint, **Guy Blomme**, Kathleen S. Crew, Murray Sharman, Simona Kraberger, Anisha Dayaram, Matthew Walters, David A. Collings, Batsirai Mabvakure, Philippe Lemey, Gordon W. Harkins, John E. Thomas, and Arvind Varsani 2015. The global distribution of Banana bunchy top virus reveals little evidence for frequent recent, human-mediated long distance dispersal events. *Virus Evolution*, 2015, 1(1): 1–16
- 3) **Blomme, Guy**, Kim Jacobsen, Walter Ocimati, Fen Beed, Jules Ntamwira, Charles Sivirihauma, Fred Ssekiwoko, Valentine Nakato, Jerome Kubiriba, Leena Tripathi, William Tinzaara, Flory Mbolela, Lambert Lutete, Eldad Karamura (2014). Fine-tuning banana *Xanthomonas* wilt control options over the past decade in East and Central Africa. *European Journal of Plant Pathology*, 139: 265–281.
- 4) Nakato, G.V., W. Ocimati, **G. Blomme**, K.K.M. Fiaboe and F. Beed 2014. Comparative importance of infection routes for banana *Xanthomonas* wilt and implications on disease epidemiology and management, *Canadian Journal of Plant Pathology*, DOI: 10.1080/07060661.2014.959059
- 5) Ocimati, W., V. Nakato, K.M. Fiaboe, F. Beed and **G. Blomme**. 2014. Incomplete systemic movement of *Xanthomonas campestris* pv. *musacearum* and the occurrence of latent infections in *Xanthomonas* wilt infected banana mats. *Plant Pathology*. Doi: 10.1111/ppa.12233
- 6) Swennen, Rony, **Guy Blomme**, Piet van Asten, Pascale Lepoint, Eldad Karamura, Emmanuel Njukwe, William Tinzaara, Altus Viljoen, Patrick Karangwa, Danny Coyne and Jim Lorenzen. 2013. Mitigating the impact of biotic constraints to build resilient banana systems in Central and Eastern Africa. In: B. Vanlauwe, P. van Asten and **G. Blomme** (Eds.). *Agro-Ecological Intensification of Agricultural Systems in the African Highlands*. Earthscan from Routledge. pp. 85-104.

Other Evidence of Leadership, large-program management and delivery:

Project coordination of a DFID-funded Banana integrated pest management project in Uganda, Kenya and Tanzania (2000-2003); a USAID-funded Banana germplasm evaluation project in Tanzania and Mozambique (2003-2005) and a DGD-Belgium-funded Banana R4D (CIALCA) project in Rwanda, Burundi and eastern DR Congo (the latter with a budget of 700,000 Euro per year)(2006 till 2015).

Role in RTB: Support Cluster Leader CC3.1: Pest/diseases management, of Flagship Project 3: Resilient Crops.

Name: Jürgen KROSCHER

Current position and affiliation: Science Leader Agroecology/IPM, International Potato Center, Lima, Peru

Profile:

- Extensive expertise in R&D of sustainable agricultural systems in the tropics and subtropics with specialization in agronomy, entomology and integrated pest management; special interest in plant protection product development and climate change related pest risk assessments.
- More than 25 years research and project management experiences in an international, multi-disciplinary, and multi-cultural environment in countries of Africa, Asia, and Latin America.
- Strong competence in leading scientific research teams and building partnerships for collaborative research globally; proven fund-raising record. Strong networks with universities, national agricultural research institutes and the private sector globally.

Employment:

Since 2004 **Science Leader sub-program Agroecology/IPM.** International Potato Center (CIP), Peru.
 2001-2004 **Acting head/Professor (C4) for Plant Production in the Tropics and Subtropics.** In 2003, appointed to apl. Professor in Agroecology. University of Hohenheim, Stuttgart, Germany.
 1999-2000 **Senior scientist/lecturer (C2) Entomology and Plant Production.** Institute of Crop Science in the Tropics and Subtropics, University of Kassel/Witzenhausen, Germany.
 1992-1998 **Team leader/supra-regional project Ecology and Management of Parasitic Weeds.** Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), Eschborn, Germany.

Education:

- 1997: Habilitation at the Faculty Agronomy, University of Hohenheim, Germany, *Venia legendi* in Agroecology.
- 1993: PhD, Agricultural Sciences, University of Hohenheim, Germany.
- 1987: Diploma, Agronomy, University of Hohenheim, Germany.

Selected recent peer-reviewed publications:

- 1) Khadioli N., Z.E.H. Tonnang, E. Muchugu, G. Ong'amo, T. Achia, I. Kipchirchir, **J. Kroschel**, B. Le Ru (2014): Effect of temperature on the phenology of *Chilo partellus* (Swinhoe) (Lepidoptera, Crambidae); simulation of life-table parameters and visualization of spatial pest's risk in Africa. *Bulletin of Entomological Research* 104: 809–822.
- 2) Parsa S., S. Morse, A. Bonifacio, T. C. B. Chancellor, B. Condori, V. Crespo-Pérez, S. L. A. Hobbs, **J. Kroschel**, M.N. Ba, F. Rebaudok, S. G. Sherwood, S. J. Vanek, E. Faye, M. A. Herrera, O. Dangles (2014): Obstacles to integrated pest management adoption in developing countries. *PNAS* 111 (10): 3889–3894.
- 3) **Kroschel J.**, M. Sporleder, H.E.Z. Tonnang, H. Juarez, P. Carhuapoma, J.C. Gonzales, R. Simon (2013): Predicting climate change caused changes in global temperature on potato tuber moth *Phthorimaea operculella* (Zeller) distribution and abundance using phenology modeling and GIS mapping. *J. Agricultural and Forest Meteorology* 170: 228-241.
- 4) Muijca, N. and **J. Kroschel** (2013): Pest intensity-crop loss relationships for the leafminer fly *Liriomyza huidobrensis* (Blanchard) in different potato (*Solanum tuberosum* L.) varieties. *Crop Protection* 47: 6-16.
- 5) Muijca N. and **J. Kroschel** (2011): Leafminer fly occurrence, distribution and parasitoid associations in field and vegetable crops along the Peruvian coast. *Environmental Entomology* 40(2): 217-230.
- 6) **Kroschel J.** and J. Zegarra (2013): Attract-and-kill as a new strategy for the management of the potato tuber moths *Phthorimaea operculella* (Zeller) and *Symmetrischema tangolias* (Gyen) in potato - evaluation of its efficacy under potato field and storage conditions. *Pest Management Science* 69: 1205-1215.

Other Evidence of Leadership, large-program management and delivery:

- RTB phase I/complementary project: Management of RTB-critical pests and diseases under changing climates, through risk assessment, surveillance and modeling.
- BMZ-funded project: Predicting climate change induced vulnerability of African agricultural systems to major insect pests through advanced insect phenology modeling, and decision aid development for adaptation planning.
- FONTAGRO-World Bank funded project: Developing and use of ecological approaches in pest management for enhancing sustainable potato production of resource-poor farmers in Andean regions of Bolivia, Ecuador, and Peru.

Role in RTB: Cluster Leader CC 3.1: Pests and diseases management of Flagship Project 3: Resilient Crops.

Name: Marie-Soleil TURMEL

Current position and affiliation: Associate Scientist, Bioversity International

Profile: Crop production systems, agroecology, integrated soil fertility management.

Employment:

- 2014 – present: Associate Scientist, Agroecology and Farming Systems, Bioversity International, Costa Rica
- 2013 – 2014: Associate Scientist, Cropping Systems Agronomist, Global Conservation Agriculture Program, International Maize and Wheat Improvement Center (CIMMYT), Mexico
- 2011 – 2013: Post-Doctoral Fellow, Cropping Systems Agronomist, Global Conservation Agriculture Program, International Maize and Wheat Improvement Center (CIMMYT), Mexico

Education:

- 2011, Doctor of Philosophy, Renewable Resources (Soil Science and Neotropical Environments), McGill University, Montreal, Canada
- 2007, Master of Science, Plant Science, University of Manitoba, Winnipeg, Canada

Selected Recent Peer-reviewed publications:

- 1) Speratti, A, **Turmel, M.-S.**, Wall, P., Calegari, A., **Araujo, C.F.**, Peiretti, R.A. Giraudo. M.B., Violic, A., Govaerts, B., 2015. Conservation Agriculture in Latin America. In, Farooq, M. and K.H.M. Siddique (Eds). Conservation Agriculture. Springer International Publishing Switzerland. Pp 391-415.
- 2) **Turmel, M.-S.**, Speratti, A., Verhulst, N., Govaerts, B. 2014. Crop residue management and soil health: a systems analysis. Agricultural Systems Vol. 134: 6-16
- 3) Entz, M.H., C. Welsh, S. Mellish, Y. Shen, S. Braman, M. Tenuta, **M.S. Turmel**, K. Buckley, K.C. Bamford and N. Holliday. 2014. The Glenlea organic rotation: A long-term systems analysis, in: Martin, R.C. and R. MacRae (Eds.), Managing Energy, Nutrients, and Pests in Organic Field Crops. Pp. 215-238, Taylor and Francis Group, LLC.
- 4) **Turmel, M.-S.**, Entz, M.H., Tenuta, M., May, W.E., Lafond, G.P. 2011. The influence of a long-term black medic (*Medicago lupulina* cv. 'George') cover crop on arbuscular mycorrhizal fungal colonization and nutrient uptake in flax (*Linum usitatissimum*) under zero-tillage management. Canadian Journal of Plant Science 91(6): 1071-1076.
- 5) **Turmel, M.-S.**, Turner, B.L. and Whalen, J.K. 2011. Soil fertility and yield improvements in the System of Rice Intensification. Renewable Agriculture and Food Systems Vol. 26 (3): 185-192.

Other Evidence of Leadership, large-program management and delivery:

- Coordination of multi stakeholder innovation platforms (Sustainable Modernization of Traditional Agriculture (MasAgro), CIMMYT, Mexico).
- Coordination of multi-country research and extension projects (FONTAGRO, Soil health in organic banana systems, 2014-2017).

Role in RTB: Support Cluster Leader CC3.2: Sustainable Crop Production Systems of Flagship Project 3: Resilient Crops.

Name: Stefan HAUSER

Current position and affiliation: Root and Tuber Systems Agronomist, IITA

Profile: Agronomist in root & tuber crops, maize and plantain with focus on production agronomy, system improvement and sustainability. Additional expertise in complex tree crop multistrata systems (timber, cocoa, food crops), strong background in soil science, soil physics and soil ecology.

Employment:

- Sept 2011 – to date: Root and Tuber Systems Agronomist, IITA-HQ, Ibadan, Nigeria;
- Feb 2007 – August 2011: Agronomist and country representative of IITA in DR Congo;
- March 1993 – Jan 2007 Agronomist / soil scientist, IITA Humid Forest Station, Mbalmayo, Cameroon;
- Jan 1988 – Feb 1993 Soil Physicist with KALI & SALZ AG posted to IITA, Ibadan, Nigeria

Education:

- PhD, (Doktor sci agr) 1987, Agriculture, Institut fuer Pflanzenbau, University of Goettingen, Germany;
- MSc (Dipl Agr Ing) 1984 Agriculture, Institut fuer Pflanzenbau, University of Goettingen, Germany

Selected Recent Peer-reviewed publications:

- 1) Norgrove, L., **Hauser, S.** (2015) Estimating the Consequences of Fire Exclusion for Food Crop Production, Soil Fertility, and Fallow Recovery in Shifting Cultivation Landscapes in the Humid Tropics. *Environmental Management* 55, 536-549. OPEN ACCESS
- 2) Vanlauwe, B., Coyne, D., Gockowski, J., **Hauser, S.**, Huising, J., Masso, C., Nziguheba, G., Schut, M., Van Asten, P. (2014) Sustainable intensification and the African smallholder farmer. *Current Opinion in Environmental Sustainability* 8 15–22.
- 3) Norgrove, L., **Hauser, S.** (2014) Improving plantain (*Musa* spp. AAB) yields on smallholder farms in West and Central Africa. *Food Security*. DOI 10.1007/s12571-014-0365-1. OPEN ACCESS
- 4) Hoff, H., Döll, P., Fader, M., Gerten, D., **Hauser, S.** Siebert, S. (2014) Water footprints of cities – indicators for sustainable consumption and production. *Hydrology and Earth System Sciences* 18 213-226. OPEN ACCESS
- 5) Wendt, J.W., **Hauser, S.** (2013). An equivalent soil mass procedure for monitoring soil organic carbon in multiple soil layers. *European J Soil Science* 64, 58-65
- 6) **Hauser, S.**, Norgrove, L., Asawalam, D.O., Schulz, S. (2012) Effect of land use change, cropping systems and soil type on earthworm cast production in West and Central Africa. *European Journal of Soil Biology* 49 47-54.
- 7) **Hauser, S.**, Mekoa, C. and Ngo Kanga, F. 2012. The effects of burning forest biomass on the yield of the plantain (cv. Ebang, *Musa* spp. AAB, false horn) after hot-water and boiling – water treatment in southern Cameroon. *Archives of Agronomy and Soil Science*. 58, 399-409.

Other Evidence of Leadership, large-program management and delivery: Humidtropics Focal Point for IITA; Theme 5 leader in the old RTB, project leader REAFOR, ‘composante agricole’ DR Congo.

Role in RTB: Cluster Leader CC3.2: Crop production systems of Flagship Project 3: Resilient Crops.

Name: Eldad KARAMURA

Current position and affiliation: Senior Scientist & Regional Representative, ESA region, Bioversity International

Profile:

As Senior Scientist - contribute to the development of the institutional research agenda and to coordinate the implementation of research and outcome-oriented activities in eastern and southern Africa, guided by the Result Framework; monitor the regional research agenda to achieve agreed performance indicators and contribute to the research outcomes. Expertise: Crop Science focus on pest and disease management and impact assessment methodologies, including M&E and livelihoods framework analysis as management tools in smallholder perennial systems in east and central Africa;

As Regional Representative- develop and support engagement strategies for fund raising and research & development partnerships to increase CG visibility and deliver impact at scale. Expertise: project planning and management based on participatory approaches and involving situation analyses, priority setting, developing strategic objectives (vision, mission, goals, purpose and outputs, outcomes and impacts); logical and results frameworks; project proposal development and implementation.

Employment

2015-present: Senior Scientist & Regional Representative, Bioversity International, Kampala
 2005- 2014: Senior Scientist & regional Coordinator, Bioversity International, Kampala
 1997-2004: Regional Coordinator (ESA), INIBAP, Kampala
 1989-1996: Principal Research Officer, NARO-Uganda, Kampala

Education

1983: MSc in Applied Entomology Imperial College, London, UK
 1989: PhD in Acarology, Makerere University, Uganda

Selected Recent Peer-reviewed publications

- 1) J. HODGETTS, J. HALL, G. KARAMURA, M. GRANT, D.J. STUDHOLME, N. BOONHAM, **E. KARAMURA** AND J.J. SMITH (2015). RAPID, SPECIFIC, SIMPLE, IN-FIELD DETECTION OF *XANTHOMONAS CAMPESTRIS* PATHOVAR *MUSACEARUM* BY LOOP-MEDIATED ISOTHERMAL AMPLIFICATION. *JOURNAL OF APPLIED MICROBIOLOGY*; [VOLUME 119, ISSUE 6](#), PAGES 1651–1658, DECEMBER 2015
- 2) G. Karamura, J. Smith, D. Studholme, Jerome Kubiriba and E. Karamura (2015). Comparative pathogenicity studies of the *Xanthomonas vasicola* species on maize, sugarcane and banana. *African Journal of Plant Science*. Vol. 9(9), pp. 385-400, September 2015 DOI: 10.5897/AJPS2015.1327, ISSN: 1996-0824 J
- 3) J.N. Nakakawa, J.Y.T. Mugisha, **E. Karamura** and M.W. Shaw. (2016?). A Mathematical Model for the Dynamics of Banana *Xanthomonas* Wilt with Vertical Transmission and inflorescence infection. *Mathematical Modelling and Analysis*. In press.
- 4) Reuben Tendo Ssali • Andrew Kiggundu • Jim Lorenzen • Eldad Karamura • Wilberforce Tushemereirwe • Altus Viljoen (2013). Inheritance of resistance to *Fusarium oxysporum* f. sp. *cubense* race 1 in bananas. *Euphytica*. DOI 10.1007/s10681-013-0971-6
- 5) Wellington Jogo, **Eldad Karamura**, William Tinzaara, Jerome Kubiriba & Anne Rietveld (2013). Determinants of Farm-Level Adoption of Cultural Practices for Banana *Xanthomonas* Wilt Control in Uganda. *Journal of Agricultural Science*. Vol. 5, No. 7; 2013

Evidence of Leadership, large-program management and delivery

Regional Coordination: Banana Research Network for eastern and Southern Africa (11 countries); McKnight BXW regional project (Ethiopia, Kenya, Uganda)

Role in RTB: Cluster Leader BA3.3: Banana fungal and bacterial diseases (BXW & Foc) of Flagship Project 3: Resilient Crops.

Name: Emmanuel WICKER

Position: Researcher, CIRAD

Profile: Plant pathologist/microbiologist, in the area of molecular epidemiology, population biology, pathogen adaptation to plant resistance

Employment:

- Jan 2016-present: Permanent research scientist, Joint Research Unit “Plant-Microbes-Environment Interactions” (UMR IPME), CIRAD, France.
- Aug 2008-Dec 2015: Permanent research scientist, Joint Research Unit « Plant Communities and Biological Invaders in Tropical Environment » (UMR PVBMT), CIRAD, Reunion Island.
- Feb 2002-Jul 2008: Permanent research scientist, Internal Research Unit « Agro-ecological Functioning and Performances of Horticultural Systems»; Head of the Phytobacteriology Lab; CIRAD, Martinique (F.W.I.).
- Aug 1996-Jan 2002: Permanent engineer, Joint Research Unit BiO3P, UNIP-INRA, France.

Education:

- 2015: Habilitation to supervise research (“Habilitation à Diriger des Recherches” [HDR]) in Population Biology and Ecology, Université de la Réunion, France
- 2001: PhD in Plant Biology and Agronomy, ENSA Rennes, France

Selected Recent Peer-reviewed publications:

- 1) Pensec F, Lebeau A, Daunay M, Chiroleu F, Guidot A, **Wicker E**. 2015. Towards the Identification of Type III Effectors Associated with *Ralstonia solanacearum* Virulence on Tomato and Eggplant. *Phytopathology* **105**:1529-1544.
- 2) Clarke CR, Studholme DJ, Hayes B, Runde B, Weisberg A, Cai R, Wroblewski T, Daunay M-C, **Wicker E**, Castillo JA, Vinatzer BA. 2015. Genome-Enabled Phylogeographic Investigation of the Quarantine Pathogen *Ralstonia solanacearum* Race 3 Biovar 2 and Screening for Sources of Resistance Against Its Core Effectors. *Phytopathology* **105**:597-607.
- 3) Deberdt P, Guyot J, Coranson-Beaudu R, Launay J, Noreskal M, Riviere P, Vigné F, Laplace D, Lebreton L, **Wicker E**. 2014. Diversity of *Ralstonia solanacearum* in French Guiana expands knowledge on the "emerging ecotype". *Phytopathology* **104**:586-596.
- 4) N'Guessan CA, Abo K, Fondio L, Chiroleu F, Lebeau A, Poussier S, **Wicker E**, Kone D. 2012. So near and yet so far: the specific case of *Ralstonia solanacearum* populations from Cote d'Ivoire in Africa. *Phytopathology* **102**:733-740.
- 5) N'Guessan CA, Brisse S, Le Roux-Nio A-C, Poussier S, Koné D, **Wicker E**. 2013. Development of variable number of tandem repeats typing schemes for *Ralstonia solanacearum*, the agent of bacterial wilt, banana Moko disease and potato brown rot. *Journal of Microbiological Methods* **92**:366-374.
- 6) **Wicker E**, Lefeuvre P, Cambiaire JCd, Lemaire C, Poussier S, Prior P. 2012. Contrasting recombination patterns and demographic histories of the plant pathogen *Ralstonia solanacearum* inferred from MLSA. *ISME Journal* **6**:961-974.

Other Evidence of Leadership, large-program management and delivery:

- Co-leadership of the Project RESAUBER «Durable Management of Eggplant resistances to *Ralstonia solanacearum*» (2014-2016), CASDAR (French Ministry of Agriculture), 6 partners (France, Cameroon, USA).
- Partner in the ACP-UE project « Development of Sustainable Integrated Disease Management strategies for vegetable crops in the Caribbean » (2013-2015), which groups research teams from Trinidad-and-Tobago, St Vincent, Guyana, Martinique, USA, Reunion Island.
- Partner of the Research Contract “Resistance of Solanaceae to *Ralstonia solanacearum*” (2007-2010), funded by CIRAD, INRA, AVRDC, and a 6 breeders Consortium (France, Netherlands)

Role in RTB: FP3/BA3.3: Support Cluster leader BA3.3: Banana fungal & bacterial diseases (Foc/BXW) of Flagship Project 3: Resilient Crops.

Name: George MAHUKU

Current position and affiliation: Senior Plant Pathologist, International Institute of Tropical Agriculture (IITA); P.O. Box 34441, Dar es Salaam, Tanzania; e-mail: g.mahuku@cgiar.org

Profile: Over 20 years of research and development experience, 16 of which have been spent working for the CGIAR, mostly in Latin America and Africa. Have experience and expertise in Strategic planning and execution of research projects; Plant pathology & microbiology techniques; developing effective strategies for protectic crops from pathogens, developing integrated disease and pest management (IDPM) strategies suitable for smallholder farmers, including use of endophytes; building capacity of national partners in plant pathology.

Employment:

- 2015-current: **Senior Plant Pathologist**, IITA, Dar es Salaam, Tanzania.
- 2007-2015: **Senior Maize Pathologist**, CIMMYT, Texcoco, Mexico
- 1998-2007: **Senior Bean Pathologist**, CIAT, Cali, Colombia.
- 1997-1998: **Senior Research Fellow**, Agriculture and Agri-Food Canada, PEI, Canada.

Education:

- 1995: PHD, Plant Pathology, University of Guelph, Canada
- 1991: MSc, Plant Pathology / Virology, Texas A&M University, USA.

Selected Recent Peer-reviewed publications:

- 1) Grace, D., **Mahuku, G.**, Hoffmann, V., Atherstone, C., Upadhyaya, H.D., and Bandyopadhyay, R. 2015. International agricultural research to reduce food risks: case studies on aflatoxins. **Food Security** DOI: 10.1007/s12571-015-0469-2.
- 2) **Mahuku, G.**, Lockhart, B.E., Wanjala, B., Jones, M.W., Kimunye, J.N., Stewart, L.R., Cassone, B.J., Subramanian, S., Nyasani, J., Kusia, E., Kumar, L., Niblett, C.L., Kiggundu, A., Asea, G., Pappu, H., Wangai, A., Prasanna, B.M., and Redinbaugh, M. 2015. Maize lethal necrosis (MLN), an emerging threat to maize-based food security in sub-Saharan Africa. *Phytopathology* 105:956-965.
- 3) Nair, S.K., Babu, R., Magorokosho, C., **Mahuku, G.**, Semagn, K., Beyene, Y., Das, B., Makumbi, D., Kumar, P.L., Olsen, M., and Prasanna, M.B. 2015. Fine mapping of *Msv1*, a major QTL for resistance to Maize Streak Virus leads to development of production markers for breeding pipelines. *Theor Appl Genet* (2015) 128:1839–1854. DOI 10.1007/s00122-015-2551-8
- 4) Ding, J., Ali, F., Chen, G., Li, H., **Mahuku, G.**, Yang, N., Narro, L., Magorokosho, C., Makumbi, D., and Yan, J. 2015. Genome-wide association mapping reveals novel sources of resistance to northern corn leaf blight in maize. *BMC Plant Biology* 15:206 (DOI 10.1186/s12870-015-0589-z)
- 5) Manje Gowda, M., Das, B., Makumbi, D., Babu, R., Semagn, K., **Mahuku, G.**, Olsen, M.S., Jumbo M.B., Beyene, Y., and Prasanna, B.M., 2015. Genome-wide association and genomic prediction of resistance to maize lethal necrosis disease in tropical maize germplasm. *Theor Appl Genet* DOI 10.1007/s00122-015-2559-0

Other Evidence of Leadership, large-program management and delivery:

- Currently participating in a B&MGF funded project on “Improvement of banana for smallholder farmers in the Great Lakes Region of Africa” developing rapid disease screening protocols and mapping distribution in Uganda and Tanzania.
- Leading a project to develop a bio-control product (Aflasafe) for managing aflatoxins in maize and groundnuts in Tanzania. The project is funded by USAID (US\$1.8 million) for three years (2016-2018), and involves over 30 partners from public and private institution.
- Lead Scientist in developing “Managing maize lethal necrosis (MLN) in eastern Africa through accelerated development and delivery of resistant maize germplasm and seed systems support” and funded by B&MGF& Syngenta Foundation for US\$2.5 million (June, 2013 –December, 2017). Oversaw the establishment and operationalizing of a 20 ha facility. Interacted with both public and private sectors, including donors, seed companies) e.g. Monsanto, Pioneer, Seedo, etc). The facility employed 30 regular staff and over 40 casual workers.
- Lead Scientist in developing the project “A Doubled Haploid Facility for Strengthening Maize Breeding Programs in Africa” that was funded for US\$5.987 million by B&MGF. This resulted in the development of the first DH facility for public use in Africa (May 2012 –May 2017).

Role in RTB: Support Cluster Leader BA3.3: Banana fungal & bacterial diseases (Foc/BXW) of Flagship Project 3: Resilient Crops.

Name: Bonaventure Omondi AMAN ODUOR

Current position and affiliation: Associate Scientist, Epidemiologist, Bioversity International, Burundi

Profile:

Bioversity International: Epidemiologist – Control and recovery from Banana Bunchy Top Disease in Eastern and Southern Africa.

Work focus: Seed systems: Delivery of safe planting material, and Disease management

Expertise: Entomology, Epidemiology, Molecular Biology, Agricultural Extension.

Employment:

- 2014 – date: Associate Scientist, Bioversity International, Burundi
- 2014: Researcher, Agricultural research Council, Pretoria, South Africa (Molecular Systematics)
- 2008-2009: Lecturer, Masinde Muliro University: Ecology and Conservation
- 2004 -2005: Training Coordinator, Dudutech Kenya Ltd, Kenya.

Education:

2009: PhD Environmental Sciences, (Entomology), North-West University, South Africa

2003: Master of Philosophy, Entomology, University of Ghana, Legon, Ghana

Selected Recent Peer-reviewed publications:

- 1) Niyongere, C., Omondi A.B, Blomme G (2016) The Banana Bunchy Top Disease, *In*; Virus diseases of tropical and subtropical crops In: P. Tennant, G. Fermin (Ed), 12/2015: CAB International, Wallingford, United Kingdom. <http://www.cabi.org/bookshop/book/9781780644264>
- 2) Latorre-Estivalis JM, Omondi BA, Desouza O, Oliveira IR, Ignell R and Lorenzo MG(2015) Molecular basis of olfactory plasticity in *Rhodnius prolixus*, a Chagas disease vector. *Frontiers in Ecology and Evolution* 3:74. doi:10.3389/fevo.2015.00074
- 3) Omondi, AB, Majeed S, Ignell, R. (2015) Functional development of carbon dioxide detection in the maxillary palp of *Anopheles gambiae* Journal of Experimental Biology, 218:15: DOI: 10.1242/jeb.116798
- 4) McBride CS, Baier F, Omondi AB, Sarabeth A, Lutomiah, J, Sang, R. Ignell, R, Voshall L, (2014) Evolution of mosquito preference for humans linked to an odorant receptor, *Nature*, 515(7526): 222–227. DOI:10.1038/nature13964.

Other Evidence of Leadership, large-program management and delivery:

2014 – Date: Coordinating Learning Alliance for Recovery from BBTD in Malawi, Burundi and DR Congo, with collaboration in Cameroon, Benin, Gabon, and Nigeria.

2016: Coordinating Epidemiological Studies in the, BMGF Grant to Queensland University, on BBTV Management in West Africa.

Role in RTB: Support Cluster Leader BA3.4: Banana viral diseases/BBTV of Flagship Project 3: Resilient Crops. Epidemiologist: Seed Degeneration and Seed Systems Project in RTB crops (part of a network of partners towards the delivery of clean planting material).

Name: Lava KUMAR

Current position and affiliation: Head, Germplasm Health Unit/Virologist; International Institute of Tropical Agriculture (IITA), PMB 5320, Ibadan, Nigeria

Profile: Virology; molecular biology; epidemiology; diagnostics; host resistance; IDM; mycotoxins; germplasm indexing; production of virus-free planting material; facilitation of international exchange of germplasm and seed health management; knowledge and technology dissemination; R&D coordination and program management.

Employment:

01/08/10 to present: Head, Germplasm Health Unit / Virologist: IITA, Nigeria

01/08/07 to 31/07/10: Virologist (West & Central Africa): IITA, Nigeria

01/01/05 to 30/05/07: Scientist – Virology: ICRISAT, India

31/12/04 to 01/09/99: Special Project Scientist (Virology): ICRISAT, India

Education:

PhD ^{1*} ,	Virology	Sri Venkateswara University, Tirupati 517 502, AP, India	2000
MSc ²	Virology	Sri Venkateswara University, Tirupati 517 502, AP, India	1995

¹DFID (UK) fellowship; Research conducted at ICRISAT (India) and Scottish Crop Research Institute (SCRI), UK; Adjudged as best thesis in Plant Pathology by ICAR (2001); ²University first rank in MSc Virology

Selected Recent Peer-reviewed publications:

1. Kumar, P.L., Selvarajan, R., Iskra-Caruana, M-L., Chabannes, M. and Hanna, R. **2015**. Biology, etiology and control of virus diseases of banana and plantain. *Advances in Virus Research* 91: 229-269. [http://dx.doi.org/10.1016/bs.aivir.2014.10.006]
2. Kamowa-Mbewe, W., Kumar, P.L., Changadeya, W., Ntawuruhunga, P. and Legg, J.P. **2015**. Diversity, distribution and effects on cassava cultivars of cassava brown streak viruses in Malawi. *Journal of Phytopathology* 163(6): 433-443. [doi: 10.1111/jph.12339]
3. Silva, G., Bömer, M., Nkere, C., Kumar, P.L. and Seal, S.E. **2015**. Rapid and specific detection of Yam mosaic virus by reverse-transcription recombinase polymerase amplification. *Journal of Virological Methods* 222: 138-144. Doi: http://dx.doi.org/10.1016/j.jviromet.2015.06.011]
4. Patil, B.L. and Kumar, P.L. **2015**. Pigeonpea sterility mosaic virus: a legume-infecting *Emaravirus* from South Asia. *Molecular Plant Pathology* 16(8): 775-786. [Doi. No. 10.1111/mpp.12238]
5. Kumar, P.L., Hanna, R., Alabi, O.J., Soko, M.M., Oben, T.T., Vangu, G.H.P., and Naidu, R.A. **2011**. *Banana bunchy top virus* in sub-Saharan Africa: investigations on virus distribution and diversity. *Virus Research* 159: 171-182.
6. Gerald Otti, G., Bouvaine, S., Kimata, B., Mkamillo, G., Kumar, P.L., Tomlins, K., Maruthi, M.N. **2016**. High throughput multiplex real time PCR assay method for the simultaneous quantification of DNA and RNA viruses infecting cassava plants. *Applied of Applied Microbiology* (accepted).
7. Seal, S., Turaki, A., Muller, E., Kumar, P.L., Kenyon, L., Filloux, D., Galzi, S., Lopez-Montes, A. and Iskra-Caruana, M-L. **2014**. The prevalence of badnaviruses in West African yams (*Dioscorea cayenensis-rotundata*) and evidence of endogenous para retrovirus sequences in their genomes. *Virus Research* 186: 144-154.

Other Evidence of Leadership, large-program management and delivery: (i) Initiated BBTV Alliance since 2009, galvanized multidisciplinary stakeholders in BBTD affected countries in SSA leading to the formation of 'ALLIANCE approach for BBTD control in Africa— www.bbtvalliance.org; (ii) Led, disease component of GLCI, funded by BMGF, which led to the mapping of CBSD spread in East Africa and also development of diagnostic capacity; (iii) Led, plant health component of seed yam of YIIFSWA project funded by BMGF, which contributed to establishment of clean planting materials of popular landraces, development of QMP and certification system, capacity development in yam virus diagnostics and seed health management; Advisory member and observe of the Inter-African Phytosanitary Council; also involved in controlling important transboundary diseases such as maize lethal necrosis, cassava brown streak and other diseases.

Role in RTB: Cluster Leader BA3.4: Banana viral diseases/BBTV of Flagship Project 3: Resilient Crops; IITA leader for the RTB complementary projects on BBTV Alliance; Seed Degeneration; and Seed Framework.

Name: Marie-Line ISKRA-CARUANA

Current position and affiliation: 2B2E Research Team Leader, Tropical Plant Virologist, CIRAD

Profile

- **Interactions plant-pathogen:** expression, evolution and risk assessment of endogenous pararetrovirus sequences (EPRV): Banana streak virus (BSV) responsible of banana streak disease as biological model to study EPRV.
- **Etiology, diversity and epidemiology of Mediterranean and Tropical viral diseases** (viroids, cucumovirus, potyvirus, potexvirus, babuvirus, closterovirus, begomovirus and badnavirus in vegetables, citrus, passion fruits, banana).
- **Viral risk assessment in epidemic context for tropical crops** (ie Banana Bunchy top control in smallholder farms system in Africa, risk assessment of banana streak infection of plantain in intensive crop system as well as smallholder farms system in Africa and Latin America).

Experience:

2011–current: Research Team Leader and member of the direction board - UMR BGPI – CIRAD
 2006 - 2010 Deputy director of Research Unit UMR BGPI and Research Team leader - CIRAD
 2001 - 2006 Research Team leader: "Bioversity of endo and exogenous badnaviruses" UMR BGPI – CIRAD.
 1998 - 2001 Scientific representative in plant protection (MIDEC) for the Scientific Director of CIRAD

Education

2015: HDR (Accreditation to supervise research) ED SIBAGHE/GAIA, Montpellier France
 1989: PhD, Virology, University BORDEAUX II, France

Publications

- 1) Duroy P.-O., Perrier X., Laboureau N., Jacquemoud-Collet J.-P., **Iskra-Caruana M.-L.** 2016 How endogenous plant pararetroviruses shed light on Musa evolution accepted in Annals of Botany
- 2) Lava Kumar P., Selvarajan R., **Iskra Caruana M.L.**, Chabannes M., Hanna R. **2015.** Biology, etiology, and control of virus diseases of banana and plantain. In: by Gad Loebenstein and Nikolaos I. Katis. Control of Plant Virus Diseases Vegetatively-Propagated Crops. New-York : Academic Press, p. 229-269.
- 3) Rajeswaran R., Seguin J., Chabannes M., Duroy P.-O., Laboureau L., Farinelli L., **Iskra-Caruana M.-L.**, Pooggin M.M. 2014 Evasion of siRNA-directed antiviral silencing in Musa acuminata persistently infected with six distinct banana streak pararetroviruses. Journal of Virology 88 (19) : 11516-11528
- 4) **Iskra-Caruana M.-L.**, Duroy P.-O., Chabannes M., Muller E. 2014 Different partners involved in a common story. Infection, Genetics and Evolution, 21:83-89
- 5) **Iskra-Caruana M.-L.**, Chabannes M., Duroy P.-O., Muller E. 2014 A possible scenario for the evolution of Banana streak virus in banana. Virus Research 186:155-162,
- 6) Umber M., Filloux D., Muller E., Laboureau N., Galzi S., Roumagnac P., **Iskra-Caruana M.-L.**, Pavis C., Teycheney P.-Y., Seal S. 2014 The genome of African yam (Discorea cayenensis-rotundata complex) hosts endogenous sequences from four distinct badnavirus species. Molecular Plant Pathology 15(8): 790–801
- 7) Chabannes M., Baurens F.-C., Duroy P.-O., Sidibe-Bocs S., Vernerey M.-S., Rodier-Goud M., Barbe V., Gayral P., **Iskra-Caruana M.-L.** 2013. Three infectious viral species laying in wait in the banana genome. Journal of Virology, 87 (15): 8624-8637

Other Evidence of Leadership

- 2013-2017: **CGIAR Project-CRP Root, tubercules and banana** «BBTD containment and recovery: Building capacity and piloting field recovery approaches through a learning alliance». Coordinator of Democratic Republic (Congo Brazza) partner – CIRAD 250 KEuros /year
- 2002-2006: **European project 5th PCRD INCO Dev BETOCARIB** « Begomovirus disease management for suitable production of tomato in the Caribbean» ICA4-2001-10002 Scientific Coordinator – 800 KEuros
- 2002-2006: **European project 5th PCRD Research** - PARADIGM « Pararetrovirus: diseases, integration and genomes» QLK3-CCT-2002-02098 – Coordinator – 1,78 MEuros

Role in RTB: Support Cluster Leader BA3.4: Banana viral diseases/BBTV of Flagship Project 3: Resilient Crops.

Name: Kris A.G. WYCKHUYS

Current position and affiliation: Cassava Entomologist; International Center for Tropical Agriculture, CIAT Asia, Hanoi, Vietnam (k.wyckhuys@cgiar.org)

Profile: Insect biological control, arthropod food webs, agro-ecology, IPM

Employment

- 2014-present: Guest Professor – Sustainable Pest Management, Institute of Plant Protection, CAAS, Beijing, China
- 2010-present: Entomologist, International Center for Tropical Agriculture, CIAT, Cali, Colombia
- 2007-2010: Research Coordinator, Horticulture Research Center CIAA, Universidad Jorge Tadeo Lozano, Bogota, Colombia
- 2005-2007: Postdoctoral Fellow at University of Minnesota, USA

Education

- 1998: B.A. in BioScience Engineering, University of Ghent
- 2000: MSc in BioScience Engineering, Crop Protection, University of Ghent
- 2005: PhD in Entomology, Purdue University

Peer-reviewed scientific publications (total: 53)

- 1) Graziosi, I., Minato, N., Alvarez, E., Ngo Tien, D., Xuan Trinh, H., Aye, T.M., Pardo, J.M., Wongtiem, P., **Wyckhuys, K.A.G.** 2016. Emerging pests and diseases of Southeast Asian cassava: a comprehensive evaluation of geographic priorities, management options and research needs. *Pest Management Science*, in press.
- 2) Pan, H.S., Lu, Y.H., Xui, C.L., Geng, H.H., Cai, X.M., Sun, X.L., Zhang, Y.J., Williams, L. **Wyckhuys, K.A.G.**, Wu, K.M. 2015. Volatile fragrances associated with flowers mediate host plant alternation of a polyphagous mirid bug. *Scientific Reports* 5, 14805.
- 3) Lundgren, J.G., Becerra, L.A., Parsa, S., **Wyckhuys, K.A.G.** 2014. Molecular determination of the predator community of a cassava whitefly in Colombia: pest-specific primer development and field validation. *Journal of Pest Science* 87, 125-131.
- 4) **Wyckhuys, K.A.G.**, Lu, Y.H., Morales, H., Vazquez, L.L., Legaspi, J.C., Eliopoulos, P.A., Hernandez, L.M. 2013. Current status and potential of conservation biological control for agriculture in the developing world. *Biological Control* 65, 152-167.
- 5) Lu, Y.H., Wu, K.M., Jiang, Y.Y., Xia, B., Li, P., Feng, H.Q., **Wyckhuys, K.A.G.**, Guo, Y.Y. 2010. Mirid Bug Outbreaks in Multiple Crops Correlated with Wide-scale Adoption of Bt Cotton in China. *Science* 328, 1151-1154.
- 6) **Wyckhuys, K.A.G.**, Koch, R.L., Kula, R. and Heimpel, G.E. 2009. Potential exposure of a classical biological control agent of the soybean aphid, *Aphis glycines*, on non-target aphids in North America. *Biological Invasions* 11, 857-871.
- 7) **Wyckhuys, K.A.G.** and O'Neil, R.J. 2007. Agro-ecological knowledge and its relationship to farmers' pest management decision making in rural Honduras. *Agriculture and Human Values*, 24, 307-321.

Other evidence of leadership, large-program management and delivery

Coordinator of the CIAT-led Asia Cassava IPM network, an alliance of approx. 15 different institutions covering 8 different countries in Southeast Asia.

Role in RTB: Cluster Leader CA3.5: Cassava biotic stressors in the Americas and Asia of Flagship Project 3: Resilient Crops.

Name: Morag FERGUSON

Position: Crop Germplasm Scientist, International Institute of Tropical Agriculture, Nairobi, Kenya

Profile: Germplasm scientist - Main focus of research: Molecular characterization of cassava germplasm; QTL identification particularly for virus resistance for application in genomics breeding approaches

Professional experiences

- 2002-present: Scientist, IITA, Kenya
- 1999-2002: Special Project Scientist, ICRISAT, India
- 1997-1999: Consultant, ICARDA, United Arab Emirates
- 1993-1996: Research Associate, ICARDA, Syria

Education

- 1997: PhD in Crop Genetics, University of Birmingham, UK
- 1991: MSc in Conservation and Utilization of Plant Genetic Diversity, University of Birmingham, UK

Recent publications in international journals

- 1) International Cassava Genetic Map Consortium (ICGMC) (2015) High-Resolution Linkage Map and
- 2) Chromosome-Scale Genome Assembly for Cassava (*Manihot esculenta* Crantz) from 10 Populations. G3: Genes, Genomes, Genetics: 5:133-144.
- 3) Legg JP, P. Lava Kumar, T. Makesh Kumar, **M. Ferguson**, E. Kanju, P. Ntawuruhunga and W. Cuellar (2015). Cassava Virus Diseases: Biology, Epidemiology and Management. Advances in Virus Research 91:85-142
- 4) Rabbi, I.Y., Hamblin, M., Gedil, M., Kulakow, P., **Ferguson, M.**, Ikpan, A., Ly, D., Jannink, J. (2014) Genetic mapping using genotyping-by-sequencing in the clonally propagated cassava. Crop Science 54:1-13
- 5) Kaweesi T, R Kawuki, V Kyaligonza, Y Baguma, G Tusiime and **M Ferguson** (2014). Field Evaluation of Selected Cassava Genotypes for Cassava Brown Streak Disease based on Symptom Expression and Virus Load. Virology Journal 11:1-14
- 6) Kawuki RS, L Herselman, MT Labuschagne, I Nzuki, I Ralimanana, M Bidiaka, MC Kanyange, G Gashaka, E Masumba, G Mkamilo, J Gethi, B Wanjala, A Zacarias, F Madabula and **ME Ferguson** (2013). Genetic Diversity of Cassava (*Manihot esculenta* Crantz) Landraces and Cultivars from Southern, Eastern and Central Africa. Plant Genetic Resources 11:170-181
- 7) Rabbi IY, HP Kulembeka, E Masumba, PR Marri, **M Ferguson** (2012) An EST-derived SNP and SSR genetic linkage map of cassava (*Manihot esculenta* Crantz). Theoretical and Applied Genetics 125:329-342
- 8) **Ferguson, ME**, S.J. Hearne, T.J. Close, S. Wanamaker, W.A. Moskal, C.D. Town, J. de Young, P.R. Marri, I.Y. Rabbi, E.P. de Villiers (2012). Identification, validation and high-throughput genotyping of transcribed gene SNPs in cassava. Theoretical and Applied Genetics 124:685-695

Evidence of Leadership, large-program management and delivery

- 2009-2016: Project manager and scientist; 'Biotechnology Applications to Combat Cassava Brown Streak Disease'; Bill and Melinda Gates Foundation, \$4.2m
- 2005-2008: Project manager and scientist; 'Tapping Crop Biodiversity for the Resource Poor in Southern and Eastern Africa' Rockefeller/BECA/GCP, \$950,000
- 2003-2006: Project manager and scientist; 'Molecular marker-assisted and farmer participatory improvement of cassava germplasm for farmer/market-preferred traits in Tanzania'. Rockefeller Foundation, \$518,000.
- 2003-2004: Project manager and scientist; Biotechnology component of a project entitled 'Improving Rural Livelihoods in Southern Africa'. USAID-RCSA, Biotechnology Component USD 1m.

Role in RTB: Cluster Leader CA3.6: Cassava biological threats, Africa in Flagship Project 3: Resilient crops;

Name : Boris SZUREK

Current position and affiliation : Research scientist at IRD (IPME), plant pathologist. Email: boris.szurek@ird.fr

Profile: Plant-pathogen molecular interactions, Rice and Cassava bacterial diseases caused by *Xanthomonas* spp., host susceptibility determinants, plant resistance genes, *Xanthomonas* pathogenicity factors.

Employment:

- 2004-present: Researcher at IRD, France.
- 2002-2004: Post-doc researcher at INRA, France.

Education:

- 2015: HDR (Accreditation to supervise research), U. Montpellier, France.
- 2001: PhD in phytopathology, INAP-PG / Univ. Paris VI and XI, France.

Selected Recent Peer-reviewed publications:

- 1) Evaluation of elite rice varieties unmasks new sources of broad-spectrum bacterial blight and leaf streak resistance for Africa. Wonni I, Hutin M, Ouedrago L, Somda I, Verdier V, Szurek B. **2016 RICE**, *In press*.
- 2) Hutin M, Sabot F, Ghesquière A, Koebnik R, Szurek B. **2015** A knowledge-based molecular screen uncovers a broad spectrum *OsSWEET14* resistance allele to bacterial blight from wild rice. **Plant J.** 84(4):694-703.
- 3) Hutin M, Pérez-Quintero AL, Lopez C, Szurek B. **2015** MorTAL Kombat: the story of defense against TAL effectors through loss-of-susceptibility. **Front Plant Sci.** Jul 14;6:535.
- 4) Munoz A, Pérez A, Gomez F, Gil J, Michelmore A, Bernal A, Szurek B. Lopez C. **2014** RNAseq analysis of cassava reveals similar plant responses upon infection with pathogenic and non-pathogenic strains of *Xanthomonas axonopodis* pv. *manihotis*. **Plant Cell Rep.** 2014, 11:1901-12.
- 5) Richter A, Streubel J, Blücher C, Szurek B. Reschke M, Grau J, Boch J. **2014** A TAL effector repeat architecture for frameshift binding. **Nat Commun.** 5:3447.
- 6) Noël LD, Denancé N, Szurek B. **2013** Predicting promoters targeted by TAL effectors in plant genomes: from dream to reality. **Front Plant Sci.** 3;4:333.
- 7) Streubel J, Pesce C, Hutin M, Koebnik R, Boch J, Szurek B. **2013** Five phylogenetically close rice *SWEET* genes confer TAL effector-mediated susceptibility to *Xanthomonas oryzae* pv. *oryzae*. **New Phytol.** 200(3):808-19.

Other Evidence of Leadership, large-program management and delivery:

- PI of research program PAIX “PATHogen-Informed sustainable resistance of cassava against *Xanthomonas*” (2015 – 2018) funded by Agropolis Fondation. Main partners : Cirad, CNRS, CIAT, U. los Andes, UNAL, AGI, INERA.
- Coordinator of a WP on rice bacterial diseases within New Frontier research project *MENERGEP* « Methodologies and new resources for genotyping and phenotyping of African rice species and their pathogens for developing strategic disease resistance breeding programs » (2012 – 2014) funded by CRP RICE (GRiSP). Main partners : AfricaRice, Cirad, IITA.
- Co-PI of research project CROpTAL « TALome-based engineering of durable pathogen resistance in crops » (2014 – 2018) funded by the French National Agency (ANR).

Role in RTB: Support Cluster Leader CA3.5: Cassava biological constraints, Asia/Americas; involvement on activities related to CBB in CA3.6: Cassava biological threats, Africa of Flagship Program 3: Resilient Crops.

Name: Jean-Michel LETT

Position: Research scientist in Molecular Plant Virology, CIRAD

Profile: Molecular plant virologist and epidemiologist - Main focus of research: Diversity, Evolution and Emergence of plant-infecting viruses transmitted by insect vectors in Africa.

Professional experiences

Since 2001 Research scientist in Plant Virology, CIRAD - UMR PVBMT, Pôle de Protection des Plantes, Ile de La Réunion, France

Selected projects funded and managed

- 2008-2010: Indigenous begomovirus diversity in the south-west Indian Ocean islands (BEGOMODIV, N°044D10/MOM, 15 000 euros).
- 2009-2011: Emergence of geminiviruses in the south-west Indian Ocean islands (EMERGE, N°PRAO/AIRD/CRVOI/08/03, 200 000 euros).
- 2013-2014: Emergence of begomoviruses in Africa (EMEB, PEERS/AIRD, 50 000 euros).
- 2013-2015: Plant protection and Sustainable agriculture in sub-Saharan Africa (ProVeg, PARRAF/AIRD, 156 527 euros).

Education

- 2014: Accreditation to supervise research (HDR) in Plant Virology, University of La Réunion, St-Pierre, France
- 2000: PhD in Plant Virology, Paris Institute of Technology for Life, Food and Environmental Sciences (AgroParisTech), Paris, France

Selected recent publications:

- Zinga I, Chiroleu F., Legg J., Lefeuvre P., Kosh Komba E., Semballa S., Yandia S.P., Mandakombo N., Reynaud, B. and **J.-M. Lett (2013)**. Epidemiological assessment of cassava mosaic disease in Central African Republic reveals the importance of viral mixed infection and poor health of plant cuttings. *Crop Protection*, 44, 6-12. [IF: 1,40]
- Harimalala M., De Bruyn A., Hoareau M., Ranomenjanahary S., Andrianjaka A., Reynaud B. Lefeuvre P., and **J.-M. Lett (2013)**. Molecular characterization of a new alphasatellite associated with a cassava mosaic geminivirus in Madagascar. *Archives of Virology*, 158, 1829-1832. [IF: 2,11]
- Muhire B., Golden M., Murrell B., Lefeuvre P., **Lett J.-M.**, Gray A., Poon A., Ngandu N., Semegni Y., Tanov E., Monjane A., Harkins G., Varsani A., Shepherd D., Martin D.P. **(2014)**. Evidence of Pervasive Biologically Functional Secondary Structures within the Genomes of Eukaryotic ssDNA Viruses. *Journal of Virology*, 88, 1972-1989. [IF: 5,40]
- Péréfarres F., Thébaud G., Lefeuvre P., Chiroleu F., Rimbaud L., Hoareau, M., Reynaud, B. and **J.-M. Lett (2014)**. Frequency-dependent assistance as a way out of competitive exclusion between two strains of an emerging virus. *Proceedings of the Royal Society B*, 281, 20133374. [IF : 5,60]
- Harimalala M., Chiroleu F., Giraud-Carrier C., Hoareau M., Ranomenjanahary S., Andrianjaka A., Reynaud B. Lefeuvre P., and **J.-M. Lett (2014)**. Molecular epidemiology of cassava mosaic disease in Madagascar. *Plant Pathology*, 64, 501–507. [IF: 2,13]
- Roux-Cuvelier M., Teyssedre D., Chesneau T., Jeffray C., Massé D., Jade K., Abdoul-Karime A.L., Hostachy B., Reynaud B., Legg J.P. and **J.-M. Lett (2015)**. First report of cassava brown streak disease and associated Ugandan cassava brown streak virus in Mayotte Island. *New Disease Reports* 30, 28. [IF: NA]
- Becker N., Rimbaud L., Chiroleu F., Reynaud B., Thébaud G. and **J.-M. Lett (2015)**. Rapid accumulation and low degradation: key parameters of Tomato yellow leaf curl virus persistence in its insect vector Bemisia tabaci. *Scientific Reports*, 5, 17696; doi:10.1038/srep17696. [IF: 5,58]

Role in RTB: Support Cluster Leader CA3.6: Cassava biological threats, Africa of Flagship Project 3: Resilient crops

FP4: Nutritious food & added value

Name: Simon HECK

Current position and affiliation: Program Leader, Strategic Program on Resilient, Nutritious Sweetpotato, International Potato Center (CIP)

Profile: (Main experience, area(s) of expertise, attributes of relevance):
Food and nutrition security, postharvest, value chain, program manager

Employment:

- 2014-present: Program Leader, Strategic Program on Resilient, Nutritious Sweetpotato, International Potato Center (CIP), Uganda
- 2013-present: Project Leader, Scaling-up Sweetpotato through Agriculture and Nutrition (SUSTAIN), International Potato Center (CIP), Uganda
- 2012-2013. Deputy Program Manager, Sweetpotato Program in Africa, International Potato Center (CIP), Uganda
- 2011 – 2014: Chair, Agro-Enterprise Learning Alliance for Eastern and Southern Africa

Education:

- 1997: Ph.D. in Social Anthropology, Boston University, USA
- 1988: M.A. in Anthropology, Geography, Political Science, Johannes Gutenberg Universität, Mainz, Germany

Selected Recent Peer-reviewed publications:

- 1) Lagekvist, C.-J., J. Okello, P. Muoki, and **S. Heck**. 2016. Nutrition promotion messages: The effect of information on consumer sensory expectations, experiences and emotions of vitamin A-biofortified sweet potato. Food Quality and Preference (submitted).
- 2) **Heck, S.** and R. Ackatia-Armah. 2015. Scaling-up integrated agriculture-nutrition-market approaches to promote biofortified crops: the case of orange fleshed sweetpotato in four African countries. Paper presented at 2nd International Conference on Global Food Security, Ithaca, NY, USA, 11-14 October 2015.
- 3) Longley C, Thilsted SH, Beveridge M, Cole S, Nyirenda DB, **Heck S** and Hother A-L (2014). The Role of Fish in the First 1,000 Days in Zambia. In Harris, Jody; Haddad, Lawrence and Grütz, Silke Seco (2014) Turning Rapid Growth into Meaningful Growth: Sustaining the Commitment to Nutrition in Zambia, Brighton: IDS. Pp. 27-35.
- 4) **Heck, S.**, C. Béné, and R.R. Reyes-Gaskin. 2007. Investing in African fisheries: Building links to the millennium development goals. Fish and Fisheries 8:211-226.

Other Evidence of Leadership, large-program management and delivery:

- Program Leader, Strategic Program on Resilient, Nutritious Sweetpotato: 30 research projects in 15 countries in Africa and Asia; \$22m+ annual budget
- Project Leader, Scaling-up Sweetpotato through Agriculture and Nutrition: 5-year \$18m project to reach 1.2m households with OFSP; research on scalability

Role in RTB: Leader of Flagship 4: Nutritious food & added value

Name: Bussie MAZIYA-DIXON

Current position and affiliation: Senior Scientist; International Institute of Tropical Agriculture (IITA)

Profile:

Over 15 years of experience working in sub Saharan Africa with the International Institute of Tropical Agriculture (IITA), a member of the Consortium of International Agricultural Research Centers as a Food Scientist/Technologist responsible for food and nutrition research. I have extensive knowledge of research on nutritional quality assessment of both raw and processed products; product development, improving the nutritional quality of traditional food products through food to food fortification, and nutritional assessment and food consumption surveys.

Employment:

- 2014-present: Senior Scientist, IITA, Nigeria
- 2012-present: CRP Leader/Coordinator, IITA, Nigeria
- 2001-present: Crop Utilization Specialist (Food Scientist), IITA, Nigeria
- 1999-2000: Visiting Scientist, IITA, Nigeria,

Education:

- 1992: PhD in Food Science, Kansas State University, USA
- 1989: MSc in Food Science, Kansas State University, USA

Selected Recent Peer-reviewed publications:

- 1) De Moura, F. F., Moursi, M., Lubowa, A., Ha, B., Boy, E., Oguntona, B. E., Sanusi, R., **Maziya-Dixon, B.** 2015. Cassava intake and vitamin A status among women and preschool children in Akwa-Ibom, Nigeria. PLoS ONE. 10(6) (e0129436):1 -14.
- 2) Wasiu Awoyale, **Bussie Maziya-Dixon**, Lateef Oladimeji Sanni and Taofi k Akinyemi Shittu. 2015 Effect of water yam (*Dioscorea alata*) flour fortified with distiller ' s spent grain on nutritional, chemical, and functional properties. Food Science and Nutrition, doi: 10.1002/fsn3.254.
- 3) **Busie B. Maziya-Dixon** and Alfred G. O. Dixon. 2015. Carotenoids content of yellow-fleshed cassava genotypes grown in four agroecological zones in Nigeria and their Retinol Activity Equivalents (RAE). Journal of Food, Agriculture & Environment Vol.13 (2): 63 - 69.
- 4) Abdoulaye, T., Abass, A., **Maziya-Dixon, B.**, Tarawali, G., Okechukwu, R., Rusike, J., Alene, A., Manyong, V., Ayedun, B. 2014. Awareness and adoption of improved cassava varieties and processing technologies in Nigeria. J. Development and Agricultural Economics 6(2):67-75
- 5) Njukwe, E., Onadipe, O. O., Amadou Thierno, D., Hanna, R., Kirscht, H., **Maziya-Dixon, B.**, Araki, S., Mbairanodji, A., Ngue-Bissa, T. 2014. Cassava processing among small-holder farmers in Cameroon: opportunities and challenges. Int. Journal of Agricultural Policy and Research. 2(4):113-124
- 6) Wireko-Manu, F.D., Ellis, W., Odoro, I., Asiedu, R., **Maziya-Dixon, B.** 2013. Prediction of the suitability of water yam (*Dioscorea alata*) for amala product using pasting and sensory characteristics. Journal of Food Processing and Preservation. pp: 1-7.

Other Evidence of Leadership, large-program management and delivery:

Over the years, I have gained experience in science leadership and management. I have coordinated and managed research projects that involve a variety of research and development partners, colleagues from national and international institutions with specialization in a range of disciplines, such as agriculture, public health, nutrition, social science (economics including gender), and biometrics. Hence, I have gathered experience in administrative and management skills together with project planning and design, budgeting, implementation, and monitoring. In addition, I have led or participated in interdisciplinary teams in proposal writing. I lead the CRP on Agriculture for Nutrition and Health and the Result Based Management (RBM) Pilot on Cassava Processing.

Role in RTB: Cluster Leader CC4.1: Postharvest innovation and nutrition improvement of Flagship Project 4: Nutritious food and added value.

Name: Thierry TRAN

Current position and affiliation: Senior Researcher, CIRAD - UMR Qualisud

Profile: Efficiency of RTB processing equipment at large scale and small scale. Expertise areas: Quality of RTB-based products: physico-chemical and functional properties; Life Cycle Assessment (LCA) and environmental impacts; Multi-objective optimization. Recent activities include technical and economic surveys of cassava processing factories in six countries in Asia, Africa and Latin America; and numerical simulations of flash drying.

Employment:

- 2009 – present: Senior researcher, Centre de Coopération Internationale en Recherche Agronomique pour le Développement (CIRAD), Montpellier, France. Based in Bangkok (Thailand) since 2011.
- 2005 – 2009: Researcher, Cassava and Starch Technology Research Unit (CSTRU), BIOTEC - Kasetsart University, Bangkok, Thailand.
- 2003 – 2005: Postdoctoral fellow, Food Sciences Division, University of Nottingham, UK.

Education:

- 2003: PhD Food Sciences and Technology, University of Nottingham, UK and Kellogg, UK/USA
- 1999: MSc Physics & Chemistry, Ecole Supérieure de Physique et Chimie Industrielles (ESPCI), France

Selected Recent Peer-reviewed publications:

- 1) Hansupalak N., Piromkraipak P., Tamthirat P., Manitsorasak A., Sriroth K., **Tran T.** (2015). Biogas reduces the carbon footprint of cassava starch: A comparative assessment with fuel oil. *Journal of Cleaner Production*. [dx.doi.org/10.1016/j.jclepro.2015.06.138](https://doi.org/10.1016/j.jclepro.2015.06.138). **I.F. 3.844**
- 2) **Tran T.**, Da G., Moreno-Santander M.A., Velez-Hernandez G.A., Giraldo-Toro A., Piyachomkwan K., Sriroth K., Dufour D. (2015). A comparison of energy use, water use and carbon footprint of cassava starch production in Thailand, Vietnam and Colombia. *Resources, Conservation and Recycling* 100, 31-40. **I.F. 3.026**
- 3) Da G., Dufour D., Giraldo A., Moreno M., **Tran T.**, Velez G., Sanchez T., Le Thanh M., Marouzé C., Maréchal P.A. (2013). Cottage level cassava starch processing systems in Colombia and Vietnam. *Food and Bioprocess Technology* 6(8), 2213-2222. **I.F. 3.703**
- 4) Maldonado P., Grosmaire L., Dufour D., Giraldo Toro A., Sanchez T., Calle F., Moreno A.M., Ceballos H., Delarbre J.L., **Tran T.** (2013). Combined effect of fermentation, sun-drying and genotype on breadmaking ability of sour cassava starch. *Carbohydrate Polymers* 98, 1137-1146. **I.F. 3.942**
- 5) Bessou C., Basset-Mens C., **Tran T.**, Benoist A. (2012). LCA applied to perennial cropping systems: a review focused on the farm stage. *International Journal of Life Cycle Assessment*, 18(2), 340-361. **I.F. 2.362**

Other Evidence of Leadership, large-program management and delivery:

- Leader of the CS1 work package “Optimization of selected small and medium processing systems for cassava” in the 2013-2016 RTB complementary funding project: Driving livelihood improvements through demand-oriented interventions for competitive production and processing of Roots Tubers and Bananas (RTBs), involving CIAT, IITA and CIRAD in Vietnam, Thailand, Tanzania, Nigeria, Colombia, Paraguay; and national partners (Univalle, Kasetsart University, KMUTT).
- Coordinator of the work package on processing and product quality in the EuropeAid PDMACIM project: Sustainable cassava production in Central Africa and market integration.
- Organizer of a networking workshop “Drying optimization for the sustainable development of cassava industry” with a grant from the SEA-EU-NET project, in partnership with the 8th Starch Update conference, Bangkok (Thailand) in December 2015 (200 participants).

Role in RTB: Cluster Leader CA4.2: Cassava processing of Flagship Project 4: Nutritious food and added value.

Name: Elizabeth PARKES

Current position and affiliation: Cassava breeder, International Institute of Tropical Agriculture (IITA), Ibadan, Nigeria

Profile: HarvestPlus cassava breeder, developing provitamin A cassava. Support over five African countries to breed and mainstream provitamin A cassava in their breeding program. Support delivery and advocacy work on provitamin A cassava by providing foundation seeds and technical support to partners in Nigeria.

Employment:

- 2012 to present: HarvestPlus cassava breeder, International Institute of Tropical Agriculture (IITA), Ibadan, Nigeria.
- 1992 – 2012: Research Scientist with CSIR Council for Scientific and Industrial Research Institutes
- 2006-2012: Research Scientist, Cassava Breeder and officer-in-charge and head of CRI Pokuase Research Station of the CSIR-Crops Research Institute, Pokuase station, CSIR-CRI, Accra Office Ghana CSIR-CRI Kumasi
- 1996 – 1997: Research Scientist, CSIR- Institute of Scientific and Technological Information INSTI, Accra
- 1992 – 1996: Assistant Research Officer CSIR-CRI, Fumesua, Kumasi,

Education:

- 2011: PhD in Plant Breeding University of the Free State, Bloemfontein, South Africa
- 2001: MPhil. in Crop Science University of Ghana, Legon

Selected recent peer-reviewed publications

- 1) **Parkes, E.**, Fregene, M., Dixon, A., Okogbenin, E., Boakye-Peprah, B. & Labuschagne, M. (2015) Developing Cassava Mosaic Disease resistant cassava varieties in Ghana using a marker assisted selection approach. IN *Euphytica*, 203. 549- 556.
- 2) Agyeman, A., **Parkes, E.** & Peprah, B. B. (2015) AMMI and GGE biplot analysis of root yield performance of cassava genotypes in the forest and coastal ecologies. IN *International Journal of Agricultural Policy and Research*, 3. 222 - 232.
- 3) Rabbi, I. Y., Kulakow, P., Manu-Aduening, J. A. , Dankyi, A. A. , Asibuo, J. Y. , **Parkes, E.**, Abdoulaye, T., Girma Tessema, G., Gedil, M., Ramu, P., Reyes, B. & Maredia, M. K. (2015) Tracking crop varieties using genotyping-by-sequencing markers: a case study using cassava (*Manihot esculenta* Crantz). IN *BMC Genetics*, 16. 1 - 11.
- 4) **E. Y. Parkes**, Y Rabbi, R.Okechukwu, E. Kanju, M. Ferguson, P. Ntawuruhunga, N. Mahungu, O.O. Aina, Agbona, A, P. Iluebbey, Ilona, A.G.O Dixon, P. A. Kulakow: Progress and current trends in cassava improvement in Sub-Saharan Africa by IITA and partners. Tropentag, Berlin, Germany August 2015
- 5) **Parkes, E.**, Kulakow, P., Maziya-Dixon, B., Iluebbey, P., Dixon, A., Agbona, A., Ogungbesan, B., Aina, O., Alamu, O. E. & Ceballos, H. 2015. Breeding for enhanced proVitamin A levels in cassava roots in Nigeria. European Nutrition Conference (FENS), Berlin, Germany, 20 -23 2015
- 6) **Parkes EY**, Fregene M, Dixon A, Boakye-Peprah B, Labuschagne MT. 2013. Combining ability of cassava genotypes for cassava mosaic disease and cassava bacterial blight, yield and its related components in two ecological zones in Ghana. *Euphytica*. 194(1):13-24
- 7) Boakye-Peprah, B., Ofori, K., Asante, I., **Parkes, E.** (2013) Performance of nine cassava (*Manihot esculenta* Crantz) clones across three environments. IN *Journal of Plant Breeding and Crop Science*, 5. 48 - 53.

Other Evidence of Leadership, large-program management and delivery: HarvestPlus Project

Leader, released four provitamin A cassava varieties. Supported delivery activities in Nigeria to over 500,000 households in Nigeria.

IITA/GIZ project leader, two MPhil students trained provitamin A cassava and draft manual on protocols for measuring total carotenoids in preparation with partners from the University of Ghana and Potsdam Generation Challenge Programme project leader for Ghana with graduates trained a cassava as team in Ghana.

Role in RTB: Cluster Leader CA4.3: Biofortified cassava of Flagship Project 4: Nutritious food and added value.

Name: Robert S. ACKATIA-ARMAH

Current position and affiliation: Regional Nutritionist – International Potato Center (CIP)

Profile: Medical and field nutritionist in teaching, research and development. Currently exploring links between agriculture and nutrition in diversified farming systems in rural settings to explore innovative approaches of incorporating food-based approaches into national nutrition programs and food systems. Experience in translating field research into sustainable community-based nutrition programs for low income households and vulnerable populations in various countries. My goal is to improve program delivery, implementation, assessment and evaluation of community-based interventions that address malnutrition and improve livelihoods.

Employment:

- 2014-present: Regional Nutritionist- International Potato Center (CIP) Sub-Saharan Africa
- 2013-2014: Consultant Nutritionist - National Community Nutrition Program Unit - Government of Madagascar/World Bank and Post-Doctoral Scholar-. University of California, Davis
- 2011-2013: Associate Junior Specialist – Program in International and Community Nutrition- College of Agricultural and Environmental Sciences. University of California, Davis
- 2009-2013: Research Nutritionist and Scientific Coordinator – Helen Keller International (HKI) Bamako, Mali and Dakar- Senegal

Education:

- 2013: PhD in Nutrition and Metabolism (MED). Boston University School of Medicine. Boston, MA. USA.
- 2006: M. Phil in Nutrition. University of Ghana, Legon – Accra, Ghana

Selected Recent Peer-reviewed publications:

- 1) **Robert Ackatia-Armah**, Christine M McDonald, Seydou Doumbia, Juergen G. Erhardt, Janet M Peerson, and Kenneth H Brown (2015). Effect of selected dietary supplements on micronutrient status during recovery from moderate acute malnutrition in young Malian children. *Am J Clin Nutr* 2015 101: 3 632-645; doi:10.3945/ajcn.113.069807
- 2) Donna J. Chapman, Anne Merewood, **Robert Ackatia-Armah**, and Rafael Pérez-Escamilla (2008). Breastfeeding Status on US Birth Certificates: Where Do We Go From Here? *Pediatrics*, Dec 2008; 122: e1159 - e1163
- 3) **Robert Ackatia-Armah**, Christine M McDonald, Seydou Doumbia, Janet M Peerson, and Kenneth H Brown (2013). Rate of participation in bi-monthly, community-based screening for acute malnutrition in rural Mali, and factors associated with screening participation *FASEB J* April 9, 2013 27:620.3
- 4) Christine McDonald, **Robert Ackatia-Armah**, Roland Kupka, Christopher Duggan, and Kenneth H. Brown. Change in body composition of young Malian children with moderate acute malnutrition over a 12 week dietary intervention *FASEB J* March 17, 2011 25:592.25 [Meeting Abstract]
- 5) Anna Lartey, **Robert Ackatia-Armah**, and Grace Suzanne Marquis Contribution of Breast milk to the total energy and nutrient intakes of Ghanaian children 18–24 months. *FASEB J*. 2006 20:A613

Other Evidence of Leadership, large-program management and delivery:

- Support to large scale CIP led initiatives and grants for nutrition related programs as regional nutrition advisor (DFID and USAID funded multi country projects)
- Academic Board member- eNutrition Academy (eNA) – Capacity building and mentorship
- Program manager at Helen Keller International Community Based Management of Acute Malnutrition (CMAM) program in Mali. \$1,000,000 Grant by UN agencies in collaboration with University of California, Davis
- Consultant to Government of Madagascar on World Bank funded program to address malnutrition and stunting
- Team Member for Nevin Scrimshaw International Nutrition Foundation (NSINF) capacity building initiative on developing research agendas, strategies for planning, managing, and communicating food and nutrition

Role in RTB: Cluster Leader SW.4.4: Nutritious, Sweetpotato of Flagship Project 4: Nutritious and added value.

FP5: Improved livelihoods at scale

Name: Piet VAN ASTEN

Current position and affiliation: Senior Scientist - Systems Agronomist - IITA

Profile: Systems agronomist at IITA-Uganda working on sustainable intensification of perennial-based cropping systems (banana, cassava, cocoa, coffee) in Africa's humid zones for the past 13 years. In his research, he has a strong focus on trans-disciplinary science ranging from the soil pit to household economics, linkages to input-output markets, drivers of technology adoption and policy engagement. He published over 50 publications in peer-reviewed journals and books and has successfully supervised over 30 MSc and PhD students. His main interests are the development of more productive, profitable, and resilient agricultural systems that enable improved livelihoods of smallholder farmers, including improved opportunities for youth and women.

Employment:

- 2003-present: Systems agronomist, International Institute of Tropical Agriculture, Uganda
- 2011-2015: Climate Change focal point for CCAFS, International Institute of Tropical Agriculture, Uganda

Education:

- 1996: BSc, MSc in Agriculture and Natural Environment, Wageningen University
- 2003: PhD in Soil Science – Agronomy, Wageningen University, Holland.

Selected Recent Peer-reviewed publications:

- 1) Frelat, R., Lopez-Ridaura, S., Giller, K.E., Herrero, M. Douchamps, S., Andersson Djurfeldt, A., Erensteinb, O., Henderson, B., Kassie, M., Paul, B.K., Rigolotd, C., Ritzema, R., Rodriguez, D., **van Asten, P.J.A.**, van Wijk, M.T., 2015. Drivers of household food availability in sub-Saharan Africa based on big data from small farms. PNAS www.pnas.org/lookup/suppl/doi:10.1073/pnas.1518384112.
- 2) Bongers L. Fleskens, G., G. Van de Ven, D. Mukasa, K. Giller, **P. van Asten**, 2015. Diversity in smallholder farms growing coffee and their use of recommended coffee management practices in Uganda. *Experimental Agriculture* 1-21.
- 3) Vanlauwe, B., D. Coyne, J. Gockowski, S. Hauser, J. Huising, C. Masso, G. Nziguheba, M. Schut, **P. Van Asten**, 2014. Sustainable intensification and the African smallholder farmer. *Current Opinion in Environmental Sustainability* 8:15–22
- 4) Klapwijk, CJ, MT van Wijk, TS Rosenstock, **PJA van Asten**, PK Thornton, KE Giller, 2014. Analysis of trade-offs in agricultural systems: current status and way forward, *Current Opinion in Environmental Sustainability* 6:110–115.

Other Evidence of Leadership, large-program management and delivery:

Over the past 10 years Piet has been increasingly involved in managing and supporting research for development projects on a regional scale. He coordinated IITA's climate change research as CCAFS focal point from 2011-2015. In his role as IITA-Uganda country representative, he has been able to help attract and manage R4D projects with a total value exceeding 18 million USD between 2013-2016. As a PI of large multi-scale and multi-partner projects (a.o. CIALCA, PASIC), he proven experience with linking research to development through participatory research, backstopping of out-scaling partners and policy engagement.

Role in RTB: Leader of Flagship 5: Improved livelihoods at scale.

Name: Elisabetta GOTOR

Current position and affiliation: Head, a.i. Development Impact Unit, Bioversity International

Profile: Agricultural economist with more than ten years of professional experience in international research-for-development work in the area of economic analysis and evaluation of agricultural development problems and policies. Since January 2007, she has been working at Bioversity International first as Associate Scientist (2007-2011) and then as a Scientist, leading and managing the Impact Assessment Unit (2011 to date), now Development Impact Unit. At Bioversity her research activities focus on measuring the impact of conserving agro-biodiversity on food security, poverty, nutrition and ecosystem services applying quantitative and qualitative economic analysis and econometric techniques. She has been conducting and leading field work in Bolivia, China, Ecuador, Kazakhstan, Kenya, India, Peru, The Philippines, Uzbekistan and Yemen.

Employment:

- 2011-present: Scientist, Head, a.i Development Impact Unit, Bioversity International Rome, Italy
- 2007-2011: Associate Scientist, Impact Assessment Unit, Bioversity International Rome, Italy
- 2005- 2006: Teaching and Research Assistant, University of Reading, Department of Agricultural and Food Economics, Reading-UK
- 2003-2005: Consultant, Food and Agriculture Organization of the UN (FAO), Raw Material, Tropical and Horticultural Products Service, Rome-Italy

Education:

- 2008: *PhD Agricultural and Food Economics* University of Reading, Department of Agricultural and Food Economics, Reading - UK
- 2004: *MSc (International Trade)* University of Roma Tre, Department of Economics, Rome- Italy

Selected Recent Peer-reviewed publications:

- 1) Bellon M. R., **Gotor E.**, Caracciolo F. 2015. Assessing the effectiveness of projects supporting on-farm conservation of native crops: evidence from the High Andes of South America. *World Development*. doi:10.1016/j.worlddev.2015.01.014. <http://www.sciencedirect.com/science/article/pii/S0305750X15000157>
- 2) Bellon M.R., **Gotor E.**, Caracciolo F. 2015. Conserving landraces and improving livelihoods: how to assess the success of on-farm conservation projects? *International Journal of Agricultural Sustainability* 13:2 (167-182). doi: 10.1080/14735903.2014.986363.
- 3) **Gotor E.**, Caracciolo F., Blundo Canto, G.M., and Al Nusairi, M., 2013. Improving rural livelihoods through the conservation and use of underutilized species: evidence from a community research project in Yemen, *International Journal of Agricultural Sustainability*, DOI:10.1080/14735903.2013.796173
- 4) **Gotor E.**, Tsigas M.E., 2011. The impact of the EU sugar trade reform on poor households in developing countries: A general equilibrium analysis: *Journal of Policy Modeling*, 33:568-582.
- 5) **Gotor E.**, Caracciolo F., Watts J., 2010. The Perceived Impact of the In-Trust Agreements on CGIAR Germplasm Availability: An Assessment of Bioversity International's Institutional Activities. *World Development* 38 (10): 1486–1493
- 6) **Gotor E.**, Caracciolo F., 2010. An empirical assessment of the effects of the 1994 In Trust Agreements on IRRI germplasm acquisition and distribution. *International Journal of the Commons*, 4(1):437–451
- 7) Dulloo M.E., Ebert A.W., Dussert S., **Gotor E.**, Astorga C., Vasquez N., Rakotomalala J.J., Rabemifara A., Eira M., Bellachew B., Omondi C., Engelmann F. Anthony F. Watts J. Qamar Z. and Snook L., 2009. Coffee field collections at risk: Can cryopreservation help to ensure their long term security? *Crop Science* 49:2123–2138

Other Evidence of Leadership, large-program management and delivery:

- 2011 and 2013: lead and supervised two major external commissioned evaluations on Bioversity programs. Results were reported to the Institute's Board of Trustee, CGIAR-Research Programmes' directors, the Independent Evaluation Arrangement of the CGIAR and project donors.
- 2014: co-authored two publications describing and applying an approach for assessing the effectiveness of projects aimed at creating incentives for smallholder farmers to continue maintaining crop diversity under evolution on their farms in relevant centers of genetic diversity.

Role in RTB: Cluster Leader CC5.1: Foresight, impact assessment and co-learning of Flagship 5: Improved Livelihoods at scale.

Name: Danny COYNE

Current position and affiliation: Senior Scientist, IITA

Profile: Twenty five years + experience in agricultural research and extension in tropical cropping systems across Africa and in UK agrochemical field trials co-ordination. In-depth knowledge of tropical crop systems through involvement in, and management of, crop protection extension and pest management projects within African National Programmes and at International Agricultural Research Centres. Extensive involvement in commodity based value chains, such as peri-urban vegetable systems, banana in East Africa and yam in West Africa. Project management and team leadership within a regional context has necessitated co-ordination of staff and activities over distance, across national programmes and in facilitating the integration of activities into national programmes. Experience in the development of project proposals, implementation, monitoring and evaluation of projects, training and financial accountability.

Employment:

- 2001 – present: Senior Scientist, IITA, Nigeria, Uganda, Tanzania and Kenya.
- 2000 – 2001: Technical Advisor, GTZ, Malawi.
- 1994 – 1998: Senior Scientist, NRI, UK, based at WARDA, Côte d'Ivoire.
- 1993 – 1994: Associate Professional Officer, DfID, based at NARO, Uganda

Education:

- 1999, Ph.D. in Rice pest and disease management in West Africa, University of Reading, UK.
- 1992, M.Sc. in Agricultural Research and Development, University of East Anglia, UK.

Selected Recent Peer-reviewed publications:

- 1) **Coyne D**, Wasukira A, Dusabe J, Rotifa I, Dubois, T. 2010. Boiling water treatment: a simple, rapid and effective technique for producing healthy banana and plantain (*Musa* spp.) planting material. *Crop Protection* 29, 1478-1482.
- 2) Vanlauwe, B., **Coyne, D.**, Gockowski, J., Hauser, S., Huising, J., Masso, C., Nziguheba, G., Schut M., and Van Asten, P. 2014. Sustainable intensification and the African smallholder farmer. *Current Opinion in Environmental Sustainability* 8, 15–22.
- 3) Swennen R, Blomme G, Van Asten P, Lepoint P, Karamura E, Njukwe E, Tinzaara W, Viljoen A, Karangwa P, **Coyne D**, and Lorenzen J. 2013. In: *Mitigating the impact of biotic constraints to build resilient banana systems in Central and Eastern Africa*. Earthscan Book; Pp 85-104. Dubois, T. and Coyne, D. 2011. Integrated Pest Management of Banana. *Banana breeding: constraints and progress*. CRC Press, Boca Raton, USA, pp. 121-144.
- 4) Tenkouano A, Hauser S, **Coyne D** & Coulibaly O. 2006. Clean Planting Materials and Management Practices for Sustained Production of Banana and Plantain in Africa. *Chronica Horticulturae* 46(2), 14-18.
- 5) Dixon AGO, Bandyopadhyay R, **Coyne D**, Ferguson M, Ferris RSB, Hanna R, Hughes J, Ingelbrecht I, Legg J, Mahungu N, Manyong V, Mowbray D, Neuenschwander P, Whyte J, Hartmann P & Ortiz R. 2003. Cassava: From Poor Farmers' Crop to Pacesetter of African Rural Development. *Chronica Hortica* 43, 8-15.

Role in RTB: Cluster Leader CC5.2: Sustainable intensification and diversification for improved resilience, nutrition and income of Flagship Project 5: Improved Livelihoods at scale

Name: Jessica Evelyn RANERI

Current position and affiliation: Nutrition Research Support Officer, Bioversity International

Profile: Public Health Nutrition, Clinical Nutrition, Development Economics

Employment:

- 2015 –present: Nutrition Research Support Officer, Bioversity International (IPGRI) Rome, Italy
- 2012 –2015 - *Nutrition Programme Specialist*, Bioversity International (IPGRI) Rome, Italy
- AUG 2012 – OCT 2012, *Consultant*, Gruppo Social Fondo Ecuatoriano Popularum Progreso, Quito, Ecuador
- JUNE 2010 – JUNE 2012, *Research Assistant*, Bioversity International (IPGRI), Rome, Italy

Education:

2012-present Doctor of Applied Biological Sciences (Food Science and Nutrition), Ghent University, Belgium.
 2008-2012 Master of Human Development and Food Security (Development Economics), Roma Tre Università Degli Studi, Italy

Selected Recent Peer-reviewed publications:

- 1) Termote, C., Raneri, J., Deptford, A. & Cogill, B. Screening Wild Foods for Reducing the Cost of a Nutritionally Adequate Diet in Kenya. *Food and Nutrition Bulletin* 2014; 35:458-479

Other Evidence of Leadership, large-program management and delivery:

Bioversity International Institutional Focal Point for the Humidtropics CRP (2015-16), Lead of Nutrition Cluster of Activities in the cross-cutting Flagship of Humidtropics CRP (2014-2016)

Role in RTB: Cluster Support Leader CC5.2: Sustainable intensification and diversification for improved resilience, nutrition and income of Flagship Project 5: Improved Livelihoods at scale

Name: Netsayi Noris MUDEGE

Current position and affiliation: Gender Research Scientist (CIP-Nairobi)

Profile: rural development, agriculture, education, health, gender analysis and gender mainstreaming

Employment:

- 2013-current: Gender Research Scientist International Potato Centre, Kenya and Peru
- 2010-2013: Technical Advisor Royal Tropical Institute (KIT), the Netherlands
- 2007-2010: Associate Research Scientists African Population and Health Research Center, Kenya
- 2006-2007: Lecturer Sociology Department, University of Zimbabwe, Zimbabwe

Education:

- 2005: PhD Social Science, Wageningen Universiteit and Research Centrum, Netherlands
- 2001: MSc Sociology and Social Anthropology, University of Zimbabwe, Zimbabwe

Selected Recent Peer-reviewed publications:

- 1) **N.N Mudege**, Nyekanyeka, T.; Kapalasa, E.; Chevo, T.; Demo, P. (2015) Understanding collective action and women's empowerment in potato farmer groups in Ntcheu and Dedza in Malawi. *Journal of Rural Studies* 42, 91–101
- 2) **N.N Mudege**, Chevo, T.; Nyekanyeka, T.; Kapalasa, E.; Demo, P. (2015) Gender norms and Access to extension services and training among potato farmers in Dedza and Ntcheu in Malawi. *The Journal of Agriculture Education and Extension* pp1–15, *iFirst* [10.1080/1389224X.2015.1038282](https://doi.org/10.1080/1389224X.2015.1038282)
- 3) **N.N Mudege**, Kapalasa, E.; Chevo, T.; Nyekanyeka, T.; Demo, P. (2015) Gender norms and the marketing of seeds and ware potatoes in Malawi. *Journal of Gender Agriculture and Food Security* 1 (2), 18-41
- 4) **N.N. Mudege** and C. Kwangwari, (2013) Women and Participation in civil society – do women get empowered? The case of Goromonzi District in Zimbabwe. *Journal of Women, Politics and Policy* 34(3):238-260
- 5) **N.N Mudege** and Zulu, E.M. (2011) Discourses of Illegality and exclusion: When water access matters Global Public Health: *An International Journal for Research Policy and Practice* 6(3): 221-233
- 6) **Mudege, N. N.** and Ekeh, A. C., (2009), Gender, aging, poverty and health: Survival strategies of older men and women in Nairobi slums. *Journal of Aging Studies* 23(4): 245-257

Other Evidence of Leadership, large-program management and delivery:

Research PI and project manager: Integrating gender in RTB thematic research to enhance development outcomes 2013-2016: USD1 000 000 every two years. (IITA, CIAT, CIP and Bioversity)

Team leader and co-project manager 2011-2012: Building Skills for Life: Empowering Adolescent girls through education (230 000 British Pounds - Plan UK and Royal Tropical Institute Amsterdam). A mixed method baseline research project implemented in 9 countries Pakistan, Cambodia, El Salvador, Mali, Malawi, Zimbabwe, Sierra Leone, Rwanda & Kenya.

Programme Assistant Coordinator 2007-2010: Urban Health and Poverty Dynamics Project implemented by African Population and Health Research Center funded by the Wellcome Trust (£5million over 5 years). I coordinated research activities had financial oversight of the budget, monitored and program progress and reported to program PI.

Principal Investigator/Team Leader 2007-2008: Formative evaluation of the Presidential Initiative on AIDS Strategy for Communication to the Youth (PIASCY) (USD 100 000 APHRC and Population Council). Designed study and implemented it, managed reporting functions and donor relations.

Role in RTB: Cluster Leader CC5.3: Gender equitable development and youth employment of Flagship Project 5: Improved Livelihoods at scale.

Name: Cees LEEUWIS

Current position and affiliation: Professor of Knowledge, Technology and Innovation, Wageningen University, the Netherlands

Profile -field of expertise: innovation, communication, socio-technical change, adoption, extension, social learning, inter- and transdisciplinary research, agricultural innovation systems, development

Employment:

2012- present: Professor of Knowledge, Technology and Innovation, Wageningen University

2002-2012: Professor Communication and Innovation Studies, Wageningen University

1993-2002: Assistant/Associate prof. Communication and Innovation Studies, Wageningen University

Education:

1993: PhD in Communication and Innovation Studies (cum laude), Wageningen University, Netherlands

1988: MSc in Rural Sociology (cum laude), Wageningen University, Netherlands

Selected Recent Peer-reviewed publications

- 1) Arkesteijn, M. C. M., van Mierlo, B., & **Leeuwis, C.** (2015). The need for reflexive evaluation approaches in development cooperation. *Evaluation: The International Journal of Theory, Research and Practice*, 21(1), 99-115.
- 2) Schut, M. L. W., Klerkx, L. W. A., Sartas, M., Lamers, D., McCampbell, M., Ogbonna, H., **Leeuwis, C.** (2015). Innovation platforms: experiences with their institutional embedding in agricultural research for development. *Experimental Agriculture*.
- 3) Milgroom, J., Giller, K. , & **Leeuwis, C.** (2014). Three interwoven dimensions of natural resource use: Quantity, quality and access in the Great Limpopo transfrontier conservation area. *Human Ecology*, 42(2), 199-215.
- 4) Totin, G. G. E., **Leeuwis, C.**, van Mierlo, B. C., Mongbo, R., Stroosnijder, L., & Kossou, D. K. (2014). Drivers of cooperative choice: canal maintenance in smallholder irrigated rice production in Benin. *International Journal of Agricultural Sustainability*, 12(3), 334-354.
- 5) Kilelu, C.W., Klerkx, L. & **Leeuwis, C.** (2013). Unravelling the role of innovation platforms in supporting co-evolution of innovation: Contributions and tensions in a smallholder dairy development programme (online first). *Agricultural Systems*, 118, 65-77.
- 6) Basu, S. and **Leeuwis, C.** (2012). Understanding the rapid spread of SRI in Andhra Pradesh: Exploring the building of support networks and media representation. *Agricultural Systems*, 111, 34-44.
- 7) Gildemacher, P.R., **Leeuwis, C.**, Demo, P., Borus, D., Schulte-Geldermann, E., Kinyae, P., Mundia, P., Nyongesa, M. & Struik, P.C. (2012). Positive selection in seed potato production in Kenya as a case of successful research-led innovation. *International Journal of Technology Management and Sustainable Development*, 11(1), 67-92.

Other Evidence of Leadership, large-program management and delivery:

- Programme leader of: *Responsible life-sciences innovations for development in the digital age: Environmental Virtual Observatories for Connective Action (EVOCA) in crop, water, livestock and disease management* Financed by INREF (2015-2021)
- *Humidtropics CRP*: Strategic Research Theme leader 'Scaling RTB agri-food system innovations', member of the Management Team (2013-2016)
- *The System of Rice Intensification (SRI) as a socio-economic and technical movement in India*, funded by WOTRO (2010-2014). PhD supervisor.
- *Positive Deviance as a Catalyst for Sustainable Food Production and Nutrition in the Andes*, funded by WOTRO (2011-2015) Principal Investigator.
- *Convergence of Sciences – Strengthening Innovation Systems*. Phase 2 action research programme in Ghana, Mali and Benin funded by DGIS, (2007-2013). Active as member of the scientific board and PhD supervisor.

Role in RTB: Cluster Leader CC5.4: Scaling RTB agri-food system innovations of Flagship Project 5: Improved livelihoods at scale.

Name: Dietmar STOIAN

Current position and affiliation: Principal Scientist, Value Chains and Private Sector Engagement, Bioversity International, France

Profile: Dietmar leads Bioversity International's research on value chains and private sector engagement, with more than 20 years of experience in development-relevant research at the interface between value chains, smallholder livelihoods, and their enabling environment. He has developed the multi-chain approach aimed at food security, enhanced nutrition, employment and income, as well as the building of household and business assets across a portfolio of value chains that accounts for market, livelihood and dietary diversity.

Employment

- 2012-2015: Leader, Commodity Systems and Genetic Resources Program, Bioversity International, France
- 2001-2012: Leader, Competitiveness and Value Chains Program, CATIE, Costa Rica
- 1996-2000: Research Fellow, Inst. of Forest Policy, Markets & Marketing Section, Univ. of Freiburg, Germany
- 1994-1996: Advisor to the Community Forestry Development Program, German Development Service, Nepal

Education

- 2000: Ph.D., Forest Economics, University of Freiburg, Germany
- 1993: Diploma (M.Sc. equivalent), Forest Sciences, University of Freiburg, Germany

Selected recent peer-reviewed publications

- 1) Donovan, J., **Stoian, D.**, and Lundy, M. 2016. Inclusive value-chain development: Challenges and approaches. In: Innovation for inclusive value-chain development: Successes and challenges. (André Devaux, Maximo Torero, Jason Donovan, and Douglas Horton, Eds). IFPRI.
- 2) **Stoian, D.**, Donovan, J., Fisk, J., and Muldoon, M. 2015. Value chain development for rural poverty reduction: A reality check and a warning. In: Financial and market integration of vulnerable people: lessons from development programmes. (Linda Jones, Ed.). Practical Action Publishing.
- 3) **Stoian, D.**, Donovan, J., and Elias, M. 2015. Linking livelihoods and gender with value chain development: The case for a multi-chain approach to rural poverty reduction. Paper presented at the Agri-Gender and PIM Writeshop, IFPRI, Germany.
- 4) Orr, A., Donovan, J., and **Stoian, D.** 2015. Smallholder value chains as complex adaptive systems: A conceptual framework. Socioeconomic Discussion Paper Series 36. ICRISAT.
- 5) Proietti, C., Wittine, D., Alvarez, S., Parker, M., Schulte-Geldermann, E., **Stoian, D.**, Karamura, E., and Thiele, G. 2015. Co-constructing impact pathways with stakeholders for results-based management. RTB Brief 1 (March 2015). CIP.
- 6) **Stoian, D.** and Donovan, J. 2013. An asset-based approach to achieving pro-poor value chain development – Introduction to 5Capitals case studies. In: Assessing impacts of value chain development on poverty – A case-study companion to the 5Capitals tool. (Ree Sheck, Jason Donovan, and Dietmar Stoian, Eds.). CATIE/ICRAF/Bioversity International.
- 7) Donovan, J. and **Stoian, D.** 2012. 5Capitals: A tool for assessing the poverty impacts of value chain development. CATIE.

Other evidence of leadership, large-program management and delivery

As Program Leader at CATIE and Bioversity, Dietmar has led program planning, implementation, and M&E, with responsibility of 50+ staff and annual budgets of up to US\$12-14 million. He has served on Bioversity's Leadership Team and Research Coordination Committee and as Center Focal Point to RTB (2012-2015) and PIM (since 2015) where he also serves on the Management Committee (since 2016).

Role in RTB: Cluster Support co-leader CC5.4 and principal investigator for several activities under FP4 and FP5, in particular: 1) Scaling of innovations in RTB value chains for SME development involving women and the youth; 2) inter- and intra-household variation in smallholder livelihoods, and opportunities for increased gender-equitable benefits derived from value chain participation; 3) asset-based approaches and impact assessments with regard to the development of RTB value chains and livelihoods dependent on these; and 4) impactful partnership and scaling models, with emphasis on public-private and private-civil society arrangements. His time commitment to RTB is estimated at 25%.

ANNEX 8: RTB Open Access and Open Data

1. Planning for and implementing OA/OD in accordance with the CGIAR OADM Policy and FAIR principles, including critical issues and anticipated challenges

As a time bound Research Program, RTB will rely on program participants and third party subject specific repositories for long term preservation and accessibility of the information products produced within RTB. All but one of the program participants are implementing the CGIAR Open Access and Data Management Policy (OADMP) and its implementation guidelines, and one program participant which is not a CGIAR Center, is also embracing Open Access contractually for its work in RTB. All RTB partners will contractually be bound by the OADMP in their activities within RTB. All program participants will be required to implement the CGIAR Core Metadata scheme for achieving cross-harvesting and interoperability of different information products.

The RTB Open Access Portal will be located in the RTB website and will provide a single entry point to all RTB information products. OA information products located in various repositories will be marked with RTB metadata and their access links and metadata will be harvested and made accessible via the RTB Open Access Portal. An RTB CGSpace and an RTBDataverse (or equivalents) are envisaged for (1) RTB generated information products which are not deposited elsewhere; and (2) for duplication of certain information products if their original repositories are not compliant with the requirements of OADMP.

RTB program participants and partners will be encouraged to deposit information products in a recommended file format to facilitate long-term preservation (see list below of recommended file formats). For files in other formats, a derivative copy in a more stable format will be created if feasible. In these cases, both versions and associated metadata will be deposited in the repositories and harvested by RTB Open Access Portal.

Program Participants' Dataverse and CGSpace repositories will provide long-term access to submitted works along with associated metadata.

Recommended file formats for data and publications:

Format	File Extensions
Acrobat PDF/A	.pdf
Comma-separated values	.csv
Open Office formats	.odt, .ods, .odp
Plain text (US-ASCII, UTF-8)	.txt
XML	.xml
Shapefiles and raster files for GIS data	.shp, .tifw, .asc
Multimedia and pictures	.jpg

In addition to providing greater access to knowledge, Open Access and Open Data will allow others to reuse information products through appropriate open licenses. A variety of open licenses exist. RTB will promote the use of the Creative Commons Attribution licenses (CC-BY 4.0 or CC-BY NC 4.0) which are becoming the norm for Open Access and Open Data policies and donor requirements. The GNU General Public License (GNU GPL) will be encouraged for software and programming codes.

2. Technical considerations and operations

In order to achieve syntactic interoperability of repositories RTB program participants will be encouraged to use standards such as XML and SQL for data exchange among machines, as well as semantic interoperability through repositories that support the OAI-PMH protocol and/or are compatible with SPARQL, O-data, JSON.

The use of CG Core Metadata Schema will be required from all program participants. Dataverse and CGSpace provide the necessary interoperability when combined with relevant metadata that will enable retrieval of specific datasets. Dataverse has an API (a protocol that specifies how the software interacts with other programs) to search and access the datasets and will soon provide features for the conversion of data into the Linked Open Data compliant formats (RDF).

The following table indicates the intended repositories and platforms for housing the information products.

Table 1. Identification of repository or platform housing information products from RTB flagships and clusters for indicative datatypes.

Indicative Datatype	Repository or Platform	
	Name/s	URL/s
Roots, tubers and bananas	RTB Multi-Genomes Hub	http://www.cassavagenome.org/
Banana/ Plantain	Promusa MGIS – Musa germplasm information system Banana genome hub Musabase	www.promusa.org http://www.crop-diversity.org/mgis/ http://banana-genome.cirad.fr/ https://musabase.org/
Cassava	Cassavabase	www.cassavabase.org
Potato	Global Trial Data Management System Biomart	https://research.cip.cgiar.org/confluence/display/GDET4RT/Home http://www.biomart.org/
Sweetpotato	SweetPotatoBase Sweetpotato Knowledge Portal	www.sweetpotatobase.org http://www.sweetpotatoknowledge.org/
Yam	Yambase	www.yambase.org
Agronomy (incl. for improved natural resource management, to address climate change)	AgTrials	www.agtrials.org
GIS/ remote sensing	CGIAR Consortium for Spatial Information RTBMaps ArcGIS	www.cgiar-csi.org www.rtb.cgiar.org/RTBMaps www.arcgis.com
Genebank	GeneSYS	www.genesis-pgr.org
Genetic/ genomic	NCBI Phytozone	www.ncbi.nlm.nih.gov phytozone.jgi.doe.gov/pz/portal.html
Plant breeding (incl. for improved natural resource management, to address climate change)	Integrated Breeding Platform	www.integratedbreeding.net
Socioeconomic (incl. food security, poverty alleviation, livelihoods, nutrition...)	aWhere Dataverse Project AgEcon	www.awhere.com dataverse.org ageconsearch.umn.edu

3. Coordination and decision making

Each program participant will be responsible for the curation, quality control and availability of its information products in OADMP compliant repositories. RTB will receive the support of the lead center Knowledge and Data Management team to coordinate and link access to these information products via the RTB Open Access Portal. As information products become available, program participants will be required to report these within the RTB M&EL platform (PMELP) for monitoring compliance with the time frames established in the OADMP. RTB will benefit from the established CGIAR Knowledge Management and Data Management communities of practice for addressing practical challenges. Legal challenges such as licensing, privacy and confidentiality will be addressed within the program participants and when necessary by the RTB IP Task Force.

Table 2. List of Key staff for OA and OD coordination within RTB

Program participant	Staff responsible for OA coordination Name and position	Staff responsible for OD coordination Name and position
Bioversity	Michael Halewood Leader, Genetic Resources Policies, Institutions and Monitoring Group	Michael Halewood Leader, Genetic Resources Policies, Institutions and Monitoring Group
CIAT	Leroy Mwanzia Data and Information Manager	Leroy Mwanzia Data and Information Manager
CIP – Lead Center	Cecilia Ferreyra Acting Knowledge Management and Open Access Manager	Henry Juarez Research Informatics Unit
IITA	Martin Mueller E-Research Coordinator	Morenike Abu Contracts Compliance Officer
CIRAD	Pending designation	Pending designation

4. Narrative for required resources (e.g. human and financial)

Budget has been earmarked for OA, and PMU funding will be allocated for the development of the infrastructure and implementation of specific collaborative activities. RTB FP and clusters will budget for data management and OA publication fees. currently budget is earmarked with around 0.5% of total.

ANNEX 9: RTB Intellectual Assets Management

Intellectual Assets (IA) management will contribute to the delivery of research results to next users. Table 1 provides some examples of the envisaged IA management and delivery strategies identified per flagship project (FP) and expected product. At this stage of program development and design it is difficult to foresee a fully detailed IA portfolio (all results of research and development activities) and the best IA management strategies for each one of these. FP leaders and cluster leaders are renowned experts in their fields and are best positioned to evaluate the state-of-the-art of scientific and technological development in their fields. This expertise enables RTB to identify third party intellectual assets which may benefit RTB research and acquire these with freedom to operate (FTO) or licensing. RTB program participants have designated Intellectual Property (IP) Focal Points, who are lawyers and project administrators with very complementary sets of skills. The proposed RTB IP Task Force will bring together these IP Focal Points and create a synergetic, hybrid resource for RTB to explore available intellectual assets management options. The ToR of the RTB IP Task Force is provided (below).

Terms of Reference for the RTB IP Task Force

The RTB IP Task Force is composed of the IP Focal Points of the RTB program participants.

The RTB Tasks Force will have regular meetings once every quarter and extraordinary meetings whenever requested by an IP Focal Point or RTB flagship and/or RTB cluster leader or RTB Program Director and called by the RTB Compliance and Intellectual Assets Manger, who will assure proper interaction and communication with the RTB PMU.

There will be one in-person meeting per year during the CGIAR IP/Legal Network annual meeting as a one day side event (subject to availability of funding)

There will be 3 further online meetings a year to complement the in person meeting.

The objective of the RTB IP Task Force is four folds:

- To review various IA developments (pipeline) at cluster level at different program participants and provide feedback on available options for compliance and delivery strategy.
- To act as a resource group for the RTP program participants, Program Director, flagship and cluster leaders.
- To create an enabling cross learning environment from the expertise and experiences of the program participants and their IP Focal Points.
- To provide reasoned opinions on actual or potential disagreements on IP related matters upon request of RTB governance bodies.

The proceedings of the meeting will be reported in writing to the RTB Program Director for communication as appropriate to the relevant flagship and cluster leaders.

Upon request of one of the participants on a cases by case basis, certain issues or documents may be reviewed by the RTB IP Task Force on a confidential basis.

At its first meeting, the RTB IP Task Force may adopt its rules of procedure and modifies these thereafter upon confirmation of the IP Focal Points representing the simple majority (50% +1) of program participants.

Table 1 provides options for 5 delivery strategies which may be used alone or in combination for each cluster product.

OAP:	Open Access Publication
OAD:	Open Access Data
WS & T:	Workshop and Training for next users
IPR & RL:	Intellectual Property Rights & Responsible Licensing (for achieving impact)
FD:	Free Dissemination

Most probable strategy is marked with a **1**, the secondary strategy is marked with a **2**, and if a strategy is inapplicable or not envisaged at this stage it is marked with **0**.

Table 1: Intellectual Assets delivery strategy by FP.

FP	Research products	Next user(s)	Delivery strategy				
			OAP	OAD	WS&T	IPR&L	FD
FP1: Enhanced genetic resources	Documentation, communication and promotion for use of populations and elite breeding lines	RTB breeders and national partners involved in varietal selection and release	1	1	2	0	2
	Proof of concept of transgenic RTB varieties	National partners, variety release professionals,	1	1	0	2	0
	New genetic modification technologies	Scientists and biotechnology technicians	1	1	2	2	2
	Ex-ante/ex-post socioeconomic studies on game changing solutions	Policy makers, decision makers, Science leaders and donors	1	1	0	0	1
	Characterization and knowledge management for RTB genetic diversity	Breeders, conservationists, genebanks	1	1	2	0	1
FP2: Adapted productive varieties and quality seed of RTB crops	Models and DSS for managing RTB seed degeneration for supply of quality seed	National partners, private sector seed multipliers, farmers using farm saved seed and community seed banks	1	0	1	0	0
	Banana cultivars/hybrids adapted to farmers', consumers' and markets' needs, ready for large-scale dissemination	National partners, farmers, seed businesses	0	0	0	2	1
	Improved cassava processing technologies that maximize value addition and reduce waste	Farmers, farmer-processors, processors, agri-food businesses	1	0	1	0	1
	Rapid multiplication, tools and methods for potato seed production and on-farm seed health management	Public and private sector seed multipliers	1	0	1	2	1
	Agile and resilient potato varieties adapted for intensifying and diversifying cereal-based systems	Farmers, national partners, seed producers	0	0	1	2	1
	Guidelines, technologies, and diagnostic tools for improving OFSP seed systems	Development professionals, seed system specialists, seed companies and national partners	1	0	1	0	1
	High ratio propagation techniques and certification for quality yam seed	Seed multipliers, farmers, national partners	1	2	1	0	1

FP	Research products	Next user(s)	Delivery strategy				
			OAP	OAD	WS&T	IPR&L	FD
FP3: Resilient crops	Predictions of pest and pathogen population evolution and distribution affecting RTB crops	National decision makers, breeders, donors, farmers	1	1	1	0	1
	Affordable and environmentally friendly crop protection practices for RTB crops	Framers, national partners	1	0	1	0	2
	Strategies for surveillance, eradication and exclusion of banana fungal and bacterial diseases.	National partners and extension services, farmers	1	1	1	0	2
	Tools for improved containment and quarantine of Banana viral diseases (BBTD)	National partners and extension services, plant protection agencies, farmers	1	1	1	0	2
	Cost-effective extension methodologies for cassava biological constraints in Asia and Americas	National partners and extension services	2	2	1	0	1
	Protocols for safe germplasm exchange of cassava in Africa	Genebanks, plant protection agencies, extension services, breeders	2	2	1	0	0
FP4: Nutritious RTB food and added value	Technologies and management options for RTB post-harvest loss reduction and value-addition to waste products	Framers, extension services, processors.	2	2	1	0	1
	Product specifications and processing protocols for high quality and safe cassava-based food products	Farmers, processors, agri-food businesses, national extension services, policy makers	1	1	1	0	0
	Technologies and procedures for demand-driven, gender-sensitive development of nutritious food products based on biofortified cassava	Farmers, processors, agri-food businesses, national extension services, NGO's	2	2	1	0	0
	Evidence base, policy options, and investment guides for sustained investments in nutritious sweetpotato	Policy makers, national partners, NGO's, donors, development professionals	1	1	1	0	0
FP5: Improved livelihoods at scale	Context-specific household typologies, farming system modeling and trade-off analysis tools for RTB crops	RTB scientists, decision makers, national partners, investors, donors, agri-food businesses.	1	1	2	0	0
	Strategies and options for agricultural innovations targeting gender transformation and women empowerment	National partners, extension services, NGO's,	1	1	1	0	0
	Client-oriented strategies for technology development and refinement in scaling	Scientists, national partners, universities, extension services,	1	1	1	0	0

ANNEX 10 A: RTB Abbreviations and Acronyms

3R genes	3 Resistance Genes to <i>Phytophthora infestans</i>
A4NH	CGIAR Research Program on Agriculture for Nutrition and Health (Global Integrating CRP)
AFS	Agri-Food System
AGUAPAN	Asociación de Guardianes de Papa Nativa, Peru
ALINe	Agricultural Learning and Impact Network
ARI	Agricultural Research Institute
ASARECA	Association for Strengthening Agricultural Research in Eastern and Central Africa
AVRDC	The World Vegetable Center
BA	Banana
BAPNET	Banana Asia Pacific Network
BARNESA	Banana Research Network for Eastern and /southern Africa
BBTD/BBTV	Banana bunchy top disease / Banana bunchy top virus
BCoP	Breeding Community of Practice
BecA	Bioscience Eastern and Central Africa
BGI	Beijing Genomics Institute, China
BINGO	Big international Non-Governmental Organization
Bioversity	Bioversity International
BMGF	Bill and Melinda Gates Foundation
BMZ	Bundesministerium für Wirtschaftliche Zusammenarbeit und Entwicklung, Germany
BTI	Boyce Thompson Institute for Plant Research at Cornell University
BXW	Banana <i>Xanthomonas</i> Wilt
CA	Cassava
CABI	Commonwealth Agricultural Bureau International, UK
CapDev	Capacity Development
CARBAP	Centre Africain de Recherches sur Bananiers et Plantains, Cameroun
CAS	Chinese Academy of Science
CATAS	Chinese Academy of Tropical Agricultural Sciences
CATIE	Centro Agronómico Tropical de Investigación y Enseñanza, Costa Rica
CBB	Cassava Bacterial Blight
CBSD	Cassava Brown Streak Disease
CC	Crosscutting
CCAFS	CGIAR Research Program on Climate Change, Agriculture and Food Security (Global Integrating CRP)

CCARDESA	Centre for Coordination of Agricultural Research and Development for Southern Africa
CGIAR	Organization dedicated to international agricultural research
CIALCA	Consortium for Improving Agriculture Based Livelihood Systems in Central Africa
CIAT	International Center for Tropical Agriculture
CIP	International Potato Center
CIRAD	Centre de coopération internationale en recherche agronomique pour le développement
Cluster	Cluster of Activity
CM	Cassava Mealybug
CMD	Cassava Mosaic Disease
CN	Cyanide
CNRA	Centre National de Recherche Agronomique, Cote d'Ivoire
CoP	Community of Practice
CORAF	West and Central African Council for Agricultural Research and Development (CORAF/WE CARD)
CORPOICA	Corporación Colombiana de Investigación Agropecuaria
CRI	Crops Research Institute, Ghana
CRISPR	Clustered, regularly interspaced, short palindromic repeat ; genome editing tool
CRP	CGIAR Research Program
CRS	Catholic Relief Service
CSTRU	Cassava and Starch Technology Research Unit, Kasetsart University Thailand
CTCRI	Central Tuber Crops Research Institute, India
CWB	Cassava Witches Broom
CWR	Crop Wild Relative
DAFF	Department of Agriculture, Forestry and Fisheries, Australia
DARS	Department of Agricultural Research Services, Malawi
DArTseq	Diversity Arrays Technology Sequencing
DCL	CGIAR Research Program on Dryland Cereals and Legumes (AFS-CRP)
DFID	Department for International Development, United Kingdom
DG	Director General
DGD Belgium	Directorate General for Development Cooperation, Belgium
DI	Discovery
DNA	Deoxyribonucleic acid
DoA(E)	Department of Agriculture (Extension), Thailand

DRC	Democratic Republic of the Congo
DRD	Department for Research and Development, Tanzania
DSS	Decision Support System
DST	Decision Support Tool
EARI	Ethiopian Agricultural Research Institute
EMBRAPA	Brazilian Agricultural Research Corporation
EPPO	European and Mediterranean Plant Protection Organization
ETH	Eidgenoessische Technische Hochschule, Switzerland
FAIR	Findable, Accessible, Interoperable and Re-usable
FAO	Food and Agriculture Organization of the United Nations
FARA	Forum for Agricultural Research in Africa
FAVRI	Fruits and Vegetables Research Institute, Vietnam
FERA	Fera Science Ltd.
FOC TR4	<i>Fusarium oxysproum f.sp. cubense</i> – Tropical Race 4 (a.k.a. Panama Disease)
FONTAGRO	Fondo Regional de Tecnologia Agropecuaria
FoodSTART	Root and Tuber Crops Research & Development Programme for Food Security in the Asia and the Pacific Region
FP	Flagship Project
FSD	Frog Skin Disease
FTA	CGIAR Research Program on Forests, Trees and Agroforestry (AFS-CRP)
GBS	Genotyping by Sequencing
GCARD	Global Conference on Agricultural Research for Development
GENNOVATE	Enabling gender equality in agricultural and environmental innovation
GHG	Greenhouse Gas
GI-CRP	Global Integration CRP
GIS	Geographic Information System
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GM(O)	Genetically Modified (Organism)
GS	Genomic Selection
GxE	Genotype by Environment Interaction
HH	Household
HTP	High Throughput Phenotyping
Humidtropics	CGIAR Research Program on Integrated Systems for the Humid Tropics
IA	Intellectual Assets
IAPSC	Inter-African Phytosanitary Council
ICM	Integrated Crop Management

ICRAF	World Agroforestry Centre
ICT	Information and Communications Technology
IDH	The Sustainable Trade Initiative
IDIAF	Instituto Dominicano de Investigaciones Agropecuarias y Forestales, Republica Dominicana
IDO	Intermediate Development Outcome
IEA	Independent Evaluation Arrangement
IFAD	International Fund for Agricultural Development
IFPRI	International Food Policy Research Institute
IIAM	Agricultural Research Institute of Mozambique
IICA	Inter-American Institute for Cooperation on Agriculture
IITA	International Institute of Tropical Agriculture
ILAC	Institutional Learning and Change Initiative
ILRI	International Livestock Research Institute
INA	Impact Network Analysis
INERA	Institut National pour l'Etude et la Recherche Agronomiques, DR Congo
INIA	Instituto Nacional de Innovación Agraria, Peru
INIAP	Instituto Nacional de Investigaciones Agropecuarias, Ecuador
INISAV	Instituto de Investigaciones de Sanidad Vegetal, Cuba
INRA	Institut National pour l'Etude et la Recherche Agronomiques
IP	Intellectual Property Right
IP(D)M	Integrated Pest (and Disease)Management
IPB	Institut Pertanian Bogor (Bogor Agricultural University) Indonesia
IPG	International Public good
IPPC	International Plant Protection Convention
IRAF	Institut de Recherches Agronomiques et Forestières, Gabon
IRD	Institut de Recherche pour le Développement
IRR	Internal Rate of Return
ISABU	Institut des Sciences Agronomiques du Burundi
ISC	Independent Steering Committee
ITC	International (Musa Germplasm) Transit Center
KALRO	Kenya Agricultural and Livestock Research Organization
KSU	Kansas State University
KU Leuven	Katholieke Universiteit Leuven, Belgium
LAMP	Loop Mediated Amplification
LB	Late Blight

LCA	Life Cycle Assessment
LIVESTOCK	CGIAR Research Program on Livestock (AFS-CRP)
M&EL	Monitoring and evaluation and learning
MAIZE	CGIAR Research Program on Maize
MELIA	Monitoring, Evaluation, Learning and Impact Assessment
MGIS	Musa Germplasm Information System
MSU	Michigan State University
MUSALAC	Red Latinoamericana y del Caribe para la Investigación y el Desarrollo de las Musaceas
MusaNet	Global collaborative framework for Musa genetic resources
NaCRRRI	National Agricultural Crops Resources Research Institute, Uganda
NAR(E)S	National Agricultural Research (and Extension) Systems
NARITA	High-yielding and disease-resistant banana hybrids
NARO	National Agricultural Research Organization, Uganda
NGO	Non-Governmental Organization
NIRS	Near infrared spectroscopy
NPV	Net present Value
NRCB	National Research Centre for Banana, India
NRCRI	National Root Crops Research Institute, Nigeria
NRI	Natural Resources Institute, UK
NSTDA - BIOTEC	National Center for Genetic Engineering and Biotechnology, Thailand
OA	Open Access
OD	Open Data
OFSP	Orange-fleshed sweetpotato
PATH	Health-related not for profit organization
PCR	Polymerase Chain Reaction
PD	Program Director
PDM	Pest and Disease Management
PIA	Program Implementation Arrangement
PIM	CGIAR Research Program on Policies, Institutions and Markets (Global Integrating CRP)
PMELP	Planning, monitoring, evaluation and learning platform (IT solution)
PMU	Program Management Unit
PO	Potato
PPP	Public Private Partnership
PRA	Pest Risk Assessment
PROINPA	Fundación PROINPA, Bolivia

ProMusa	Knowledge-sharing Platform on Bananas
PVS	Participatory Varietal Selection
QDPM	Quality Declared Planting Material
QTL	Quantitative Trait Loci
R&D	Research and development
R4D	Research for development
RAB	Rwanda Agricultural Board
RAD	Restriction Associated DNA
RBM	Results Based Management
RCTs	Randomized Controlled Trials
RHUL	Royal Holloway University of London
RICE	CGIAR Research Program on Rice (AFS-CRP)
RMT	Rapid Multiplication Technology
RNA	Ribonucleic Acid
RNAi	RNA interference
RTB	CGIAR Research Program on Roots, Tubers and Bananas
SADC	South African Development Community
SARI	Savanna Agricultural Research Institute, Ghana
SDC	Swiss Development Cooperation
SDG	Sustainable Development Goal
SID	Sustainable Intensification and Diversification
SLO	System-level Outcome
SME	Small and Medium Enterprises
SMTA	Standard Material Transfer Agreement
SNP	Single Nucleotide Polymorphism
SRF	CGIAR Strategy and Results Framework
sRSA	Small RNA Sequencing and Assembly
SSA	Sub-Saharan Africa
SSCM	Site Specific Crop Manager
SSNM	Site Specific Nutrient Management
SU	Syracuse University, USA
SUN	Scaling Up Nutrition (movement)
SW	Sweetpotato
ToC	Theory of Change
UAK	Université d'Agriculture de Kétou, Benin
UCLA	University of California, Los Angeles

UDSM	University of Dar es Salaam, Tanzania
UM	University of Miami, USA
UNAN	National Autonomous University of Nicaragua
UNEP	United Nations Environment Programme
UNIKIN	University of Kinshasa, DR Congo
UNIKIS	University of Kisangani, DR Congo
UPLB	University of the Philippines Los Baños
UQ	University of Queensland, Australia
USAID	United States Agency for International Development
VAAS	Vietnam Academy of Agriculture Sciences
VAD	Vitamin A Deficiency
W1/2/3	CGIAR funding windows
WHEAT	CGIAR Research Program on Wheat (AFS-CRP)
WLE	CGIAR Research Program on Water, Land and Ecosystem (Global Integrating CRP)
WUR	Wageningen University and Research Centre
YA	Yam
ZARI	Zambia Agriculture Research Institute

ANNEX 10 B: RTB References

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science approach: crowdsourcing farmers' observations and preferences through on-farm triadic comparisons of technologies (tricot).

ANNEX 10 C: RTB Communications and Knowledge Management

Communication and knowledge management tools and approaches will be integrated across the program and serve two primary functions: promoting the program externally to raise its visibility and increase accountability among key stakeholders, and supporting the achievement of research and development impact at the Flagship Project (FP) level. This documents describes the program's approach to communication and knowledge management in Phase II, building on channels and products developed in Phase I.

1. Program and FP level communications objectives

At the **program level**, communications aims to achieve the following objectives:

- Highlight the program's contributions towards achieving the CGIAR Strategy and Results Framework 2022 targets, and alignment with the Sustainable Development Goals to demonstrate accountability.
- Promote RTB's scientific progress, process and results – emphasizing the unique potential of root, tuber and banana crops to reduce poverty, improve livelihoods and food and nutrition security – to key audiences.
- Promote a positive image of root, tuber and banana crops in donor and program countries and position them as key crops for future investment and research based on their nutritional qualities and climate resilience to bring about a higher level of media, public and political support.
- Position RTB as a thought leader, and leading authority on knowledge and research about root, tuber and banana crops.
- Disseminate RTB scientific results to key audiences through tailored communication products and channels, including making program publications, documents and knowledge products including databases visible and accessible as per the CGIAR Open Access Policy (see 1.13).
- Foster a strong program team through effective internal communication, including developing and supporting knowledge sharing platforms, processes and exercises for program partners, FPs and communities of practice.

At the **FP level**, communications tools and approaches will be utilized to help achieve specific objectives across the program's five FPs. Communications will (1) support the delivery, uptake and adoption of knowledge, practices and/or technologies by stakeholders specific to each cluster; (2) support policy influence through generating evidence-based products and facilitating dialogues with decision makers at local, national and regional levels; (3) support knowledge sharing and learning mechanisms to connect partners and/or stakeholders and strengthen RTB research.

2. Audiences

Primary audiences include (1) national level policymakers; (2) program donors including governmental organizations, foundations and the private sector; (3) partners including National Agricultural Research Systems (NARS), nongovernmental organizations (NGOs), private sector and advanced research institutes; (4) RTB Program Participants and other CGIAR centers and Research Programs; (5) regional and international media; (6) the general public interested in issues of food security. Secondary audiences for the program, who are influenced by primary audiences and thereby contribute to achieving our

communication goals include stakeholders in program countries, such as extension workers, farmer's associations and farmers. These audiences of key stakeholders are identified in the program's impact pathway and theory of change (see 1.3), and partnerships and comparative advantage strategy (see 1.8).

3. Key messages

Key messages that articulate and synthesize the program narrative will be revised in Phase II together with FP leaders, the Management Committee, Independent Steering Committee and the PMU, and embedded throughout internal and external communication products.

4. Activities

Key **program level** communications activities will include:

- Utilize and/or manage international events and conferences (e.g. [WCRTC](#), [GCARD3](#), [ISHS-ProMusa symposia](#)) to raise awareness and strengthen the position of RTB as a thought leader, as well as to support and strengthen RTB's connection with networks of root, tuber and banana research and development professionals, and engage in policy dialogue among other objectives.
- Produce communication products that demonstrate the program's scientific process, progress and success, such as success stories, case studies, briefs, infographics, blogs and annual reports.
- Continue to promote and share program information, communication and knowledge products through channels including the website, social media ([Facebook](#), [Twitter](#), [YouTube](#), [LinkedIn](#)), [SlideShare](#) and the quarterly e-newsletter.
- Update and maintain the [RTB website](#)⁶ as the online hub for the program to make RTB documents, information, and Open Access (OA) publications and databases accessible and visible.
- Support RTB Open Access initiatives through (1) integrating the RTB OA Portal in to the RTB website; (2) drafting and disseminating OA guidelines and processes; (3) conducting an audit of current RTB publications in CGSpace and updating metadata and acknowledgements as required.
- Media engagement at regional and international levels to support key objectives including positioning RTB as a thought leader, improving the image of RTB crops as key crops for future investment and research, and promoting the program's results.
- Improve internal communications through activities including (1) developing and socializing foundational documents such as Branding guidelines, Publication and Acknowledgements Guidelines and a Message Guide; (2) regular RTB-wide email communication and announcements from the Program Management Unit (PMU) and Program Director; and (3) convening program events and meetings including the RTB Annual Meeting.
- Integrate outcome story information collection in to the program's Planning, Monitoring, Evaluation and Learning Platform (PMELP) for more efficient gathering of success stories.
- Knowledge and learning in communications will be shared with other CRPs via participation in the CGIAR [KMC4CRPs](#) online group and events, and the CGIAR Communications Community of Practice.

⁶ The RTB website has received more than 114,000 unique pageviews and 43,000 unique visitors since it was launched in January 2013.

- Highlight RTB’s participation in and contribution to the cross CRP gender initiative, GENNOVATE, via blogs and content for the [Gender Network website](#).
- Contribute blogs that share learning from RTB’s research process, progress and/or results for partner websites including CGIAR.org, and the CGIAR Research Program on Water, Land and Ecosystems’ [Thrive Blog](#) - a platform for critical discussion among researchers, academics and development professionals.
- Update and monitor RTB branding to ensure a consistent and visible program profile.

FP level communication activities will include:

- Communicating evidence of efficacy of research, technologies and/or practices through products including policy briefs to influence policy change at national or district levels.
- Support and promote existing knowledge sharing portals from Phase I, including the [Sweetpotato Knowledge Portal](#) and the [ProMusa knowledge sharing platform \(including its Musapedia knowledge compendium, Musalit bibliographic database, and Musacontacts contact database\)](#), which connect partners and stakeholders to enable sharing of learning, knowledge and resources between users.
- Support the development of new online community platforms including the RTB-University Gender Integration Partnership platform, the RTB Breeding Community of Practice housed under Flagship Project 1 (FP1), and the Seed Systems Community of Practitioners under Flagship Project 2.
- Marketing and branding campaigns for quality root, tuber and banana varieties and seed to promote consumer adoption of high quality varieties and seed.
- Facilitate, promote and document workshops and events.
- Support the uptake of new technologies and/or practices through generation of tailored knowledge products such as farmer-to-farmer training videos, training manuals and media engagement with local press such as TV and community radio.
- Produce knowledge products on regulatory requirements for non-conventional breeding to be disseminated to NARS and breeders, under FP1.

5. Open Access

RTB will implement a harvesting interface which will use metadata to harvest and index RTB knowledge products from RTB Program Participants’ open access repositories. Communications, drawing on the resources of the Lead Center Open Access and Data Management team, will create a Publication and Acknowledgement Guidelines document to provide adequate information for Program Participants regarding metadata input for harvesting for Open Access databases (see 1.13). The guidelines will be disseminated to program partners and made visible on the RTB website. Compliance with the guidelines will be a contractual requirement for the Program Participants. The RTB website will host the RTB Open Access Portal making program knowledge products visible and accessible to key audiences, along with the RTB Open Access Toolkit, including policy documents, training videos, donor open access information and regularly updated Open Access publisher information.

6. Resources

Adequate financial and human resources will be allocated to achieve the program's communication goals at both the CRP and FP levels. The RTB communications specialist will coordinate the program's communications efforts, working with consultants and interns, and communication focal points in the lead and partner centers, drawing on their capacities and sharing lessons learned to grow RTB communications. Additionally, the lead center will provide information technology, library and graphic design services, and support for RTB program communications and knowledge management will be included in lead center staff work plans to ensure ongoing commitment.

Communications activities at the FP and cluster level will be implemented by FP and cluster teams, drawing on human resources in partner organizations, and contracting specialist agro-communications consultants and organizations ([AgroInsight](#), [Access Agriculture](#), [Shamba Shape Up](#)) where necessary.

7. Monitoring and evaluation

Key performance indicators (KPI) for the program level communications will be identified to monitor, evaluate and improve the program's communications activities, in conjunction with surveys for selected key audiences. An annual communications report containing achievements, lessons learned and KPI results for program level communications will be shared with RTB communication focal points to promote accountability, and knowledge sharing and learning for communications.

In Phase I surveys were utilized to draw feedback on program level communications from stakeholders including RTB scientists, partners and communication focal points in partner centers. Surveys were also used to conduct a comprehensive, large-scale [impact review of the ProMusa knowledge sharing platform](#) in 2013. Surveys will be continued to be used in Phase II to understand how RTB communication products and channels are used and assess the needs of RTB audiences.

Updates to the RTB website and in particular integration of the Open Access Portal will enable the monitoring of new data in Phase II, namely for publication downloads.

KPIs will include, but are not limited to:

- No. of media mentions
- No. of publication downloads and citations
- Social media engagement statistics
- Website statistics, including no. of unique visitors, time on site and bounce rate
- No. of newsletter subscribers, and open and click rates
- Feedback from selected RTB key audiences, including partners and RTB scientists
- Knowledge sharing platform indicators as developed by Bioversity International, including network liveliness, network connectivity, and network effects⁷.

⁷ Gotor E., Blundo-Canto G., Vezina A. (2015). The effectiveness of knowledge sharing: The case of ProMusa. Bioversity International series of Impact Assessment Briefs no. 15. Bioversity International, 6p.

ANNEX 10 D: RTB Accountability Matrix - Caveats to address during development of CRP2 full proposals

As set out in Annex 1 to the Final Guidance for the 2nd Call for Full Proposals, the collective portfolio submitted by the Centers/partners in response to this call for full proposals must be accompanied by a summary of how the 23 caveats raised in that annex by the respective stakeholders have been addressed. This annex sets out those caveats, grouped by the body putting forward the topic for added attention in the full proposals

1.1 Caveats expressed by the Joint Consortium Board/Centers/Fund Council Working Group, in its Memorandum to the Fund Council to express support for a 'green light' to move to full proposal development, dated 30 November 2015

Recognizing the advances already made in the re-submitted portfolio in the highly constrained time available, **the full proposals submitted by 31 March 2016 for ISPC review must address to the satisfaction of the ISPC, and contributors, the points set out below, to strengthen further the rationale and coherence of the planned research agenda.** Thereby delivering increased confidence that with funding from 2017 onwards, it has the capacity to deliver on SDGs in general and the Results Framework and CGIAR targets as set out in the SRF:

No	Item to address	Relevant CRP(s)	Summary of how the matters has been adequately addressed (Full Proposal sections are referenced)
1	Greater attention to discerning the role of regionally focused yield-gap closing/ sustainable intensification research in the system, as distinct from and a complement to global public goods research in areas such as crop breeding, livestock health, food policy, and others.	AFS programs; genetic gain platform)	1. FP5 cluster CC5.2 Sustainable intensification and diversification will “enable an understanding of options for sustainable intensification and diversification involving RTB-related innovations (FP2–FP4) for improved household income, dietary quality, and ecosystem function and resilience”. Hence it builds on and integrates the global dimension which is referred to. This will particularly focus on site integration countries and the systems innovation fund will create a set of incentives to link sustainable intensification with the other FPs. 2. FP2
2	More clearly articulating the strength of the arguments for maintaining genebanks and genetic gain as two separate platforms rather than an integrated effort ⁸	Genebank; Genetic gain platforms	NA
3	Crosschecking that consolidation at the cluster of activities or flagship level has not delivered unintended adverse consequences such as removing clarity for key research priorities and/or increasing transaction costs	All	3. RTB management and governance opted to create a new FP5 drawing on elements of the previous FP5 and FP6. This pooled a critical mass of linked social science research and reduced transaction costs. Place based clusters were dropped and “place based research” occurs now around site integration and with

⁸ There were a number of different views expressed during working group deliberations on this topic. Whilst there was no fundamental opposition to separate platforms, there was a call for making a much stronger case as to why they should be separate.

No	Item to address	Relevant CRP(s)	Summary of how the matters has been adequately addressed (Full Proposal sections are referenced)
			the new systems innovation fund. 4. RTB optimized management structure by reducing the total number of clusters and clarified the research priorities in each cluster by organizing the research agenda around key “products”.
4	Providing a clearer understanding of National Partners’ requirements, and how the scientific and financial program elements support them	All	This is clearly and exhaustively described in: 5. Impact pathway figures for each FP, with different next users including NARS, Plant health agencies, national universities and many others made explicit (e.g. Figure FP1.1) 6. Tables of Key partnerships (in partnership sub-section 1.0.8 in the CRP narrative and 7 in each FP) 7. CapDev and Partnership strategies (Annexes 1 and 2)
5	Setting out more clearly the interconnection and resources available for the proposed Communities of Practice in gender/youth and capacity development, with particular attention to ensuring engagement of partners in the respective Communities of Practice. Specifically, ensuring that the proposed communities of practice operate in a way that will result in meaningful progress towards sustainable engagement and impact	All	8. Connection with gender work in RTB is clarified in section 4 and 7 of CRP narrative: “Likewise, the cluster on gender-equitable development and youth employment in FP5 (CC5.3) will work closely with the gender coordinating platform to share and synthesize knowledge on how gender inequalities affect agri-food systems, and to understand the approaches and tools required to improve equitable access to RTB innovations.” 9. Annex 6 describes in detail the linkages of RTB with the gender platform 10. In CapDev sections (sub-section 1.0.10 of CRP Narrative and each FP) 11. In CapDev Strategy (Annex 2) 12. Resources for collaboration form part of the budget for the cluster in FP5: Gender-equitable development and youth employment
6	Reducing as many transaction costs as possible, particularly regarding management burden	All	13. RTB will follow the principle of subsidiarity and complement rather than duplicate center management and governance. 14. RTB already implemented recommended governance structure of single Independent Steering Committee to reduce transaction costs 15. RTB will proactively analyze and seek ways to reduce transaction costs: ○ E.g. shared development of M&E system between CRP and program participants

No	Item to address	Relevant CRP(s)	Summary of how the matters has been adequately addressed (Full Proposal sections are referenced)
			○ Moving to five FPs with a reduction of total amount of clusters simplifies decision making and has already reduced transaction costs.
7	Providing greater emphasis on soils, animal genetic conservation and the potential impact of big data across the portfolio, not limited to genetic gain	WLE, all AFS, Livestock, Big Data platform	16. Stepwise approaches to intensify crop production such as integrated soil fertility management matched with farm typologies and natural resource status is explicitly considered in FP5 CC5.2 Sustainable intensification and diversification. 17. Cross-cutting cluster (CC3.2) on crop production systems well-articulated with clusters in FP2, FP3 and FP5. CC3.2 research will focus on technologies for more productive and ecologically sustainable crop production systems 18. Annex 6 describes the linkages of RTB with the Big Data platform

1.2 Caveats expressed by the ISPC, dated 9 December 2015

ISPC comments on the portfolio (a paraphrase of a longer document)

No	Item to address	Relevant CRP(s)	Centers' summary of how the matters has been adequately addressed
Portfolio level			
8	Seek explicit prioritization within CRPs (and also between CRPs); balancing research on 'upstream' science with research on how to scale out and up relevant new knowledge and technologies (while leaving the delivery of impact at scale to organizations with that remit)	All	19. RTB explains its up-/downstream research mix and the changing nature of upstream science vs research on scaling as clusters move from piloting to scaling (CRP narrative sub-sections 1.0.2 and 1.0.3) and the use of W1&2 in budget narratives for the CRP as well as each FP.
9	Important to capture synergies between CRPs so that the System delivers more than the sum of the CRPs (the One System One Portfolio mantra)	All (statement of portfolio synthesis required)	20. Agree this is vitally important and a key function of W1&2 investment. RTB proposes a net increase in inter-CRP collaboration, much of which would depend on sufficient 'coordination' funding. 21. Cross CRP synergies are described in detail in tables in annex 6 which identifies the value added from collaboration. 22. Partnership tables in each FP show the capture of CRP synergies (sub-section 7) and CRP narrative (sub-section 1.0.8).
10	Clearer explanations of what W1&2 funding will be used for	All	23. Described in budget narratives for CRP and for each FP 24. Additionally uplift budget is principally W1&2 so the outcomes associated with the uplift budget are principally attributable to W1&2
11	CRPs should not be expected to adhere to the 'prioritization' undertaken in a very short time-frame to produce the 'Refreshed' submission, but should hold serious discussion with their partners on which activities to prioritize according to the principles which were agreed at FC14	All	25. RTB conducted an extensive priority assessment which is described in the narrative. 26. RTB is completing a congruence analysis of the fit between investments and outcomes which will guide further decisions by RTB governance
Platforms			
12	2 new platforms are proposed: Genebanks and Genetic gains. The ISPC is comfortable with the platform on Genebanks	Not applicable	NA
13	Have concerns about the focus of the proposed Genetic Gains and what the creation of such a platform will mean for the AFS CRPs (and	Genetics Gain platform	NA

No	Item to address	Relevant CRP(s)	Centers' summary of how the matters has been adequately addressed
	theories of change). The ISPC also found the title of 'Genetic gains' to be inappropriate as what is proposed is only part of the research required to deliver 'genetic gains'. The budget needs to be reviewed		
14	Supports the concept of an initiative in Big Data and does not want to see this de-emphasized	Big Data platform	NA
15	Identify where budget is placed for other arrangements to meet cross cutting system work originally considered through Expressions of Interest at the pre-proposal stage	All c.f. Guidance doc	NA
AFS CRPs			
16	DCLAS: The rationale for DCLAS receiving a 'C' rating overall (from the ISPC) related to the breadth of species being considered; the funders are requested to indicate their priorities for this CRP	This addressed to funders not to CRPs	NA
17	FTA has moved tenure and rights to PIM – although PIM don't mention that. FTA also wants to move the restoration work to WLE. Given the decreased budgets overall, these 2 CRPs may not accept these moves and the topics may hence disappear. Clarity on the potential loss of these areas is required	FTA, PIM, WLE	NA
18	Livestock and FISH both wish to move some genetics research across to the new platform as may other CRPs, yet the budget sources for those moves are not clear	Livestock, Fish, Genetic Gain platform	NA
19	Maize propose to move some bilateral projects out of the CRP due to budget cuts. What is an appropriate balance of W1/2 bilateral at the base funding scenario?	MAIZE	NA
20	RAFS (and presumably other CRPs) proposes to reduce the number of targeted IDOs and sub-IDOs – and both RAFS and Wheat make reference to cutting back on capacity development due to budget cuts. Realistic adjustments to current funding and base scenario funding will need to be considered by CRPs and funders	RAFS, WHEAT.	27. Based on interaction with MELCoP, RTB has targeted a limited number of sub-IDOs (and thus IDOs, SDGs), driven by need for credibility, the differentiation between multi-CRP (portfolio) versus per-CRP impacts and by need for realism about capacity to monitor progress towards impact. 28. RTB proposed total yearly W1&2 Phase II budget is significantly lower than average for Phase I. Proposed uplift budget would restore to earlier level. But under base budget it's clear that achievements linked to W1&2 need to be scaled back compared to the

No	Item to address	Relevant CRP(s)	Centers' summary of how the matters has been adequately addressed
			expectation two years ago with higher budgets.
Global Integrating Programs			
21	The ISPC is glad that PIM has agreed to take on the role of co-ordination of a System-wide platform or Community of Practice for gender work, although we hope that it will be possible to reinstate the original budget. It is hoped that down-rating gender from a Flagship to 'Cross-cutting work' does not reflect diminishing importance of gender	PIM re role of the FP on gender	NA
22	A4NH and WLE seem to be following the ISPC recommendations (through additional steps for integration with CRPs through defined flagships, while the CCAFS Summary in Annex 2 suggests the budget cuts: 'need a totally new business model', the ISPC understands that only minor changes are now being proposed	A4NH, WLE, CCAFS, PIM	NA

1.3 Additional caveats expressed by the Fund Council during its ad hoc meeting on 11 December 2015.

The Fund Council noted that its granting of a 'green light' to move to full proposal development was subject to the caveats noted by the Working Group and ISPC (in their written submission) and the Fund Council's request for enhanced focus on gender and capacity building. The Fund Council also specifically acknowledged that CGIAR is engaged in an incremental process and some concerns raised by Fund Council members will require additional time and attention before the new portfolio of CRPs is approved.

No	Item to address	Relevant CRP(s)	Summary of how the matters has been adequately addressed
23	Enhanced focus on gender and capacity building	All	29. RTB describes priority investments under gender in CRP narrative sub-section 1.0.4, each FP sub-section 9 and annex 3 30. RTB describes priority investments under capacity development in CRP narrative and FP sub-sections 10 and annex 2

ANNEX 10 E: RTB contribution to the SRF target

Note on methods used to estimate RTB contribution to the SRF targets

RTB adopted a bottom-up approach to estimate 2022 outcome targets. Targets, estimated at the cluster level using a combination of methods, were aggregated at flagship and CRP levels following a 3-step methodology briefly presented in this note. RTB expected contributions to the SRF targets are presented in PIM Table A.

Step 1: Estimation of targets at the cluster level

In brief: Country specific targets related to relevant sub-IDOs were calculated using the results of an ex-ante assessment of the impact of crop-specific research options. Key assumptions and parameters used in the ex-ante assessment exercise are available at [this link](#).

In 2013-14 RTB carried out an ex-ante assessment of the impact of priority research options on poverty reduction for the main RTB crops (banana, cassava, potato, sweetpotato and yam). The exercise was based on quantitative assessments of adoption potential and the use of an economic surplus model. It included several steps: 1) mapping of crop production by agro-ecology and targeting of research areas; 2) constraints analysis; 3) identification of main research options, which included stakeholder consultation and expert surveys; 4) quantification of key parameters; 5) estimation of research impacts⁹.

The research options identified in the priority-assessment are crop-specific showing a high level of congruence with the crop clusters in the program structure (See Section 1.0.2, Figure 5). In parallel with the priority assessment, RTB developed initial versions of impact pathways and theory of changes for each cluster which allowed the mapping of the expected contributions against the set of Intermediate Development Outcomes (IDOs).

Parameters elicited for the economic surplus model for each research option and the results obtained provided the main basis for estimating RTB expected contribution to the SRF targets. In particular, the estimated adoption curve was used as the basis for calculating the number of beneficiaries. Estimated cropped area under two adoption scenarios (high and low adoption) was divided by the average cropped area per household to estimate the number of adopting households, and then multiplied by household size to estimate total number of beneficiaries. The impact of each research option on rural poverty reduction was calculated by first estimating the marginal impact on poverty reduction of an increase in the value of agricultural production using poverty reduction elasticities of agricultural productivity growth. The reduction in the total number of poor was then calculated by considering the estimated economic benefits as the additional increase in agricultural production value.

The target definition process at the cluster level reveals the broad geographical scope (multi-country) and the integrated approach (multidisciplinary interventions, causal pathway built on the effects promoted by sets of different research outputs) adopted by RTB. Expected changes in crop yields and economic surplus results for the RTB target countries were used to quantify (sub-)IDO-related targets at the cluster level. A conservative approach was applied to limit possible overestimation of targets and double-counting. In particular, where more than one research option was mapped into the same cluster and for the same country, only the research option that showed the largest number of adopters was considered.

⁹ Please refer to the working papers for more detailed information:
<http://www.rtb.cgiar.org/category/resources/working-papers/>

The proposal document and delivery flagship projects 2, 3 and 4, presents detailed tables (See Section 2, Table FP2.2., Table FP3.2., and Table FP4.2.) with targets disaggregated by sub-IDO and by cluster.

Step 2: Aggregation of cluster level targets at the flagship project level

In brief: Within each flagship project, contributions of different clusters to the same sub-IDO were aggregated. Figures were aggregated first at the country level assuming no overlaps in terms of beneficiaries between potato and other RTB crops and assuming an overlap of 90% between banana/plantain, cassava, sweetpotato and yam. Figures calculated per each country were summed up to obtain an aggregated target per sub-IDO and per Flagship.

When defining targets for higher levels (flagships and program), potential estimation biases with multiple crops were considered. RTB deploys its efforts in Africa, Asia, Latin America and the Caribbean. RTB crops are key staple crops in many countries and in some cases are planted together in agri-food systems. In order to reduce any double counting of the expected benefits, the overlap of different crops in the same system was taken into account while aggregating figures. In those countries where more than one cluster was expected to contribute to development outcomes, the number of beneficiaries was calculated by considering the following assumptions 1) the total number of potato-related beneficiaries (this is grown at higher altitudes/cooler latitudes than the other crops with less overlap), 2) the highest number of beneficiaries related to one of the other four crops (ie bananas, cassava, sweetpotato or yam) and 3) 10% of the total number of beneficiaries related to the remaining crops in that country due to the fact that all crops except potato are cultivated in similar agroecologies.

A first level of aggregation was obtained with figures presented by sub-IDO and flagship (See Section 2, Table FP2.2., Table FP3.2., Table FP4.2.).

Table 1 - RTB outcomes and IDOs for FP5 with details on 2022 targets and countries

	IDO ID	2022 Targets				Site integration	
		1.3	1.4	2.1	3.3		
		Increased incomes and employment	Increased productivity	Improved diets for poor and vulnerable people	More sustainably managed agro-ecosystems		
	Unit of measurement	# households	# households	# households	# ha		
Country	Contributing Clusters					LEAD Center(s) /CRP ¹	Entities with major infrastructure ¹
Bangladesh	PO2.5, SW2.6, SW4.4	152.650	158.966	7.431			
Burkina Faso	SW2.6, SW4.4	1.087	7.250	7.250		IITA	
Cameroon	BA3.4, CA2.3, CA3.6, CA4.3, PO2.4	10.000	27.567	62.500	21.077		IITA
Congo, DRC	BA3.4, CA2.3, CA3.6, CA4.3, PO2.4, SW2.6, SW4.4	1,395.350	1,395.350	100.000	156.769	IITA	IITA
Ethiopia	PO2.4, SW2.6, SW4.4	3.923	104.332	26.153			
Ghana	BA3.4, CA2.3, CA3.6, CA4.3, SW2.6, SW4.4, YA2.7	157.256	157.256	125.000	88.339	IITA	IITA
India	CA2.3, PO2.5, SW2.6, SW4.4	307.480	311.051	5.717	-		CIP
Kenya	BA3.3, BA3.4, CA2.3, CA3.6, CA4.3, PO2.4, SW2.6, SW4.4	15.000	82.332	100.000	5.133		CIAT, CIP
Malawi	BA3.4, CA2.3, CA3.6, CA4.3, PO2.4, SW2.6, SW4.4	34.451	142.225	142.225	15.519	CIP	IITA, CIAT, CIP
Mozambique	BA3.4, CA2.3, CA3.6, CA4.3, PO2.4, SW2.6, SW4.4	75.018	143.260	143.260	101.383	IITA, CIP	IITA, CIP
Nepal	PO2.5	76.609	76.609	-	-	Bioversity	
Nigeria	BA3.4, CA2.3, CA3.6, CA4.3, PO2.4, SW2.6, SW4.4, YA2.7	245.612	1,137.875	183.858	344.934	IITA	IITA
Rwanda	BA3.3, BA3.4, CA3.6, CA4.3, PO2.4, SW2.6, SW4.4	15.000	256.891	75.000	29.737	CIAT, CIP, IITA	CIAT
Tanzania	BA3.3, BA3.4, CA2.3, CA3.6, CA4.3, PO2.4, SW2.6, SW4.4	79.742	184.052	184.052	71.845	IITA, CIAT	IITA, CIAT
Uganda	BA3.3, BA3.4, CA2.3, CA3.6, CA4.3, PO2.4, SW2.6, SW4.4	49.533	708.905	225.194	141.781	CIAT, CIP/RTB, Bioversity	IITA, Bioversity, CIAT, CIP
Vietnam	BA3.4, CA2.3, CA3.5, PO2.5, SW2.6, SW4.4, PO2.5	74.673	85.823	5.818	97.858	CCAFS/CIAT, RTB/CIP	CIAT
Zambia	CA2.3, CA3.6, CA4.3, SW2.6, SW4.4	17.798	17.798	50.000	16.035	IITA	IITA

Due to its strong learning and support nature, FP5 has a theory of change that combines direct contributions to (sub-)IDOs and indirect contributions through synergies and linkages with other delivery flagships. Since FP5 interventions will be concentrated in countries selected for site integration, these countries were considered for estimating targets. As FP5 will integrate and enhance impacts across crops

then, in terms of beneficiaries, a complete overlap between clusters intervening in the same country was assumed and the number of beneficiaries was calculated for each combination of country x IDO taking into account only the contribution of the cluster with the highest number of beneficiaries in the country. The results of this exercise are presented in Table 1. Based on this table, additional targets expected as direct FP5 contribution at the (sub-)IDO level were estimated as 20% of these figures.

Step 3: Estimation of RTB contribution to SRF targets

In brief: For the CRP, two levels of aggregation were considered: the IDO level and the SRF level. For the aggregation at the IDO level, a procedure similar to that applied for estimating target per sub-IDO at the flagship level was used. The difference was that for the IDO level, all contributions across flagships were considered and following the hierarchy presented in Figure 3, Section 1.0.1, sub-IDO targets were aggregated up to the corresponding IDO. Additional assumptions and methods used for estimating RTB contribution at the SRF level are detailed for each target in this section.

The second level of aggregation, corresponding to quantified targets for IDOs at the CRP level, was obtained considering cluster x country contributions to IDOs across flagships. The same conservative approach was applied to limit, as far as possible, double counting of beneficiaries in the same country. Results are presented in Table 2.

Table 2 - RTB: Beneficiaries for target IDOs by SLO

SLO	Target IDOs	Total number of beneficiaries (2022) ^A	Primary target countries ^B
1	Increased incomes and employment	20,000,000 people (50% women) have increased their income. 30,000 small and medium enterprises are operating more profitably in the RTB seed and processing sectors.	Africa: Burundi, Cameroon*, Congo, Democratic Republic of the Congo (DRC)*, Ethiopia**, Ghana*, Ivory Coast, Kenya*, Malawi*, Mozambique*, Nigeria**, Rwanda*, Tanzania**, Uganda*, Zambia* Americas: Bolivia, Colombia, Ecuador, Haiti, Nicaragua**, Peru Asia: Bangladesh**, China, India*, Indonesia, Nepal*, Thailand, The Philippines, Vietnam**
1, 2	Increased productivity	8,000,000 farm households have increased RTB yield through adoption of improved varieties and sustainable management practices.	
2	Improved diets for poor and vulnerable people	10,000,000 people (50% women) have improved their diet quality (measured by dietary diversity score).	
3	More sustainably managed agro-ecosystem	1,900,000 ha of current RTB production area converted to sustainable cropping systems.	

^A Figures on beneficiaries are aggregated for all RTB crops. Specific ranges for change (e.g., income and yield increase) are presented by cluster/crop in the specific Flagship project document.

^B The 26 primary target countries where RTB crops are of greatest importance include 17 of the 20 prioritized for CGIAR (2015) site integration (+) and all 6 of those fast-tracked for more intensive integration (CGIAR 2015).

The final part of this note presents additional assumptions and figures considered for the estimation of RTB contribution to SRF 2022 targets.

SRF Target 1.1 - 100 million more farm household have adopted improved varieties, breeds or trees, and/or improved management practices

RTB contribution: 8 million

In order to estimate RTB contribution to this target, technologies and practices integrated in impact pathways that to contribute both to SLO1 and SLO3 were considered. This included adopters in FP2 and FP3. For each crop, a complete overlap between the adoption of improved varieties/clean planting materials (mostly captured in FP2) and management practices (mostly captured in FP3) was assumed. For

each country, the total number of potato-related beneficiaries were then considered together with the highest number of beneficiaries related to the next most important other crops and only 10% of the beneficiaries related to the remaining other crops.

SRF Target 1.2 - 30 million people of which 50% are women, assisted to exit poverty

RTB contribution: 3.5 million

Results obtained from the ex-ante assessment of the impact of priority research options on poverty reduction were used. For estimating targets in 2022, 2017 was used as year 0 in the economic model and 40% of the poverty reduction figures provided by the economic model were considered for year 10.

SRF Target 2.1 - Improve the rate of yield increase for major food staples from current <1% to 1.2-1.5%/year

RTB contribution: 1.4%/year

For the full proposal an average yield increase rate was estimated across all RTB crops using FAOSTAT 2015 data. This value is highly indicative and in the RTB case will not be an accurate indicator of CRP contributions. Detailed targets should be adopted by crop and by country/region in order to use this target to track genetic gain and for management purposes.

SRF Target 2.3 - 150 million more people, of which 50% are women, without deficiencies of one or more of the following essential micronutrients: iron, zinc, iodine, vitamin A, folate, and vitamin B12

RTB contribution: 10 million

Expected contributions of Vitamin A-rich sweetpotato, cassava and banana (FP4 and FP2) and incipient contribution of micronutrient-dense (Fe & Zn) potatoes were considered. It was assumed that population targeted in key countries suffers from vitamin A micronutrient deficiency; quantity produced for direct consumption at the household level is positively affecting all household members; spill-over effect through commercialization and inclusion of RTB crops in nutrition-based national programs will be effective in targeted countries.

SRF Target 2.4 - 10% reduction in women of reproductive age who are consuming less than adequate number of food groups

RTB contribution: 3%

Based on WHO [country profiles on maternal and perinatal health](#), the percentage and the total number of women aged 15-49 years as a sub-set of the group of beneficiaries was calculated for target 2.3 in 10 targeted countries were estimated. Based on FAOSTAT data on prevalence of food inadequacy (%) (3-year average) (2011-2013) (Suite of Food Security Indicators, FAOSTAT, 2015) and assuming that prevalence of food inadequacy for women aged 15-49 years is comparable with prevalence of food inadequacy for the total population in the same country, the total number of women aged 15-49 years suffering from food inadequacy was calculated.

It was assumed that half of the women aged 15-49 years who will benefit of RTB-related interventions will improve their diet quality and will consume daily an adequate number of food groups. Based on these assumptions target values (expressed as %) for each country and at the CRP level were determined.

SRF Target 3.3 - 55 million hectares (ha) degraded land area restored

RTB contribution: 1.9 million

Number of ha under sustainable management practices estimated in FP3 and FP5 were considered. As targets estimated for FP5 are expressed as additional benefits due to adoption of system innovations, contributions at the CRP level coincide with the sum of flagship targets.

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