Tackling Global Research and Development:

CIP's Engagement Agenda

CENTRO INTERNACIONAL DE LA PAPA
CIP
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Science for a food-secure future

The International Potato Center (known by its Spanish acronym CIP) is a research-for-development organization with a focus on potato, sweetpotato, and Andean roots and tubers. CIP is dedicated to delivering sustainable science-based solutions to the pressing world issues of hunger, poverty, gender equity, climate change and the preservation of our Earth's fragile biodiversity and natural resources.

Our vision is roots and tubers improving the lives of the poor. Our mission is to work with partners to achieve food security, well-being, and gender equity for poor people in root and tuber farming and food systems in the developing world. We do this through research and innovation in science, technology, and capacity strengthening.

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Foreword

Dr. Barbara H. Wells
and Dr. Rodney Cooke

On behalf of the CIP Board of Trustees, we must say that it is a privilege to serve an organization that is working with partners to achieve food security, improved well-being, and gender equity for poor people in root and tuber farming and food systems in the developing world. The past year showed that CIP is a progressive, responsive and formidable agricultural research and development organization. Through sound management of resources and willingness to address the difficult development issues posed by a 2050 world with 9 billion inhabitants, CIP is headed in the right direction.

Center Highlights

CIP has seen steady programmatic and financial growth over the past years and 2013 continued this trend. The highlight of the year was continuing the lead in implementing the CGIAR Research Program on Roots, Tubers and Bananas. CIP is the lead partner in this exciting research program and is joined by

three other CGIAR partner centers: International Center for Tropical Agriculture (CIAT), International Institute for Tropical Agriculture (IITA), and Bioversity International; as well as the new partner to RTB during 2013, Centre de coopération internationale en recherche agronomique pour le développement (CIRAD). CIP is also working in seven other CGIAR Research Programs (CRP). These CRPs also allow CIP to expand its research to continue playing an important role in improving potato and sweetpotato production systems and the livelihoods of millions of people around the world.

Strategic and Corporate Plan 2014-2023

At the end of the year, The Board of Trustees approved the CIP Strategy and Corporate Plan 2014-2023. The management team, staff and Board of Trustees worked on the new plan throughout the year and is now preparing to implement the strategy in 2014. The stories in this Annual Report highlight CIP's ability to deliver results on the Strategic Objectives proposed in the plan by highlighting work done in 2013. The executive summary of the Strategy and Corporate Plan has been included to provide the reader with the context driving the need for this updated Plan and the six Strategic Objectives. The role of the Roots, Tubers, and Bananas CRP has also been explained.

Financial Performance

The Center was successful in achieving an operating surplus of US$2.8M in 2013 and achieved revenue of US$68M during 2013, a year-over-year increase of nearly 18%. Approximately US$17.3M was contracted to our partner CGIAR Centers through the Roots, Tubers and Bananas CRP.

Appreciation

The Board expresses its gratitude and appreciation to Dr. Pamela Anderson for her leadership and dedication to the International Potato Center during her time as Director General and Deputy Director General for Research. The Board welcomes Dr. Barbara Wells as the new Director General of the International Potato Center, who began her new role in February 2014.

On behalf of the Board, we would like to thank CIP's donors, investors, and all CGIAR partners for their support. We also extend our appreciation to CIP's management and staff for their continued dedication to the organization and its important mission.

Dr. Rodney Cooke
Chair, Board of Trustees

Dr. Barbara H. Wells
Director General

Research, Innovation, and Impact

Executive Summary

There have been dramatic changes in both CIP's operating environment and the broader external environment. This is particularly true for our donors, who increasingly—and understandably—value an emphasis on pragmatic science and research that deliver tangible development impacts. In response, CIP has developed a new Strategy and Corporate Plan (SCP) for the next 10 years. Some of the fundamental changes driving the SCP include the following: the emergence of a post-2015 development framework; evolving regional and national frameworks that empower countries to own and lead their own development; CGIAR reform, with an expanded focus that explicitly addresses food and nutritional security; and a richer and more diverse partnership landscape. Added to this dynamic set of forces is a heightened sense of urgency that it is imperative to catalyze a step-change in development impact within the next generation. This shift is driving the focus on Results-Based Management (RBM), the scaling-up of innovations, and a more sustained emphasis on gender issues.

The new SCP builds on a solid legacy of CIP's past achievements. The overarching strategic question is: how do we enhance our impact? We propose to streamline our program to focus on six strategic objectives (SOs). Three of the SOs (1–3) will move us into the research and development

(R&D) space in order to deliver shorter term solutions to food security in our target commodities and geographies by going to scale with flagship technologies. Two SOs (4 and 5) will continue to address more upstream research for development that intends to deliver future research outputs, through the discovery flagships, representing longer term solutions for development. The sixth SO, on biodiversity conservation and use, underlines our continuing commitment to protect and utilize the world potato and sweetpotato germplasm collections.

Clearly, going to scale requires testing models, then carefully monitoring and evaluating them so that the best options contribute to scaling up the technologies. This will be done by moving from proof of concepts, to coordination in an out-scaling stage, to finally reaching a scale-up phase with development partners. Throughout, CIP's pro-poor R&D cycle will guide the process. Gender-transformative research and social inclusion need to be considered more explicitly in the implementation of this cycle. This will make the design, testing, and going to scale of technologies more efficient and ensure that gender relationships are not harmed. Capacity strengthening of partners and CIP's teams, as well as monitoring and evaluation (M&E) and learning, will be essential for moving forward with the SCP.

The R&D SOs are:

- **SO 1:** Combating Vitamin A Deficiency with Resilient, Nutritious Orange-Fleshed Sweetpotato (OFSP)
- **SO 2:** Enhancing Food Security in Asia through the Intensification of Local Cereal-based Systems with the Early-Maturing Agile Potato
- **SO 3:** Improving Livelihoods of Potato Farmers in Africa by Tackling Deteriorated Seed Quality through an Integrated Approach

Although SOs 1 and 3 are closer to going to scale, and SO 2 still requires additional proof of concept, we expect to start achieving impacts at the household level from each of these SOs over the next five years.

The research-for-development SOs embody 21st-century upstream research on biotechnology and systems research. They are:

- **SO 4:** Accelerating the Discovery

of Game-changing Solutions for Food Security

- **SO 5:** Addressing the Food Security Challenge through Roots and Tubers: Transforming Vulnerability to Resilience
- **At the heart of CIP's mission is SO 6:** Conserving Biodiversity for the Future—the CIP Genebank. This SO builds on the legacy of conserving genetic resources over the last 40 years to ensure that conservation and utilization are enhanced for the coming decades.

As part of the implementation plan for these SOs in the scope of the SCP (2014–2023), the formal presence of the CIP-China Center for Asia and the Pacific (CCCAP) will play a key role. CCCAP was established in 2010 to support our efforts to improve food security and reduce poverty. In the next two to three years CCCAP will expand its program via a leading-edge Asia and Pacific R&D potato and sweetpotato platform, with particular relevance to SOs 1, 2, and 4, as well as contributions to a number of CGIAR Research Programs (CRPs).

CIP's SOs are fully aligned with the CRPs, particularly with RTB, for which SOs 1, 2, and 3 are already active flagships. The genebank-related SO 6 is fully aligned with the Genebank CRP. Therefore, CIP's work in achieving its SOs will contribute to the Intermediate Development Outcomes (IDOs) prioritized by the CRPs and CGIAR. In turn, CIP's direct participation in the eight CRPs will support our efforts to achieve our SOs. In addition to the SOs, CIP's SCP outlines corporate objectives (COs). The COs address the operational challenges that will be required to implement the SOs successfully.

The best way to enhance CIP's impact over the next 10 years is to assume greater responsibility for uptake pathways to development while maintaining our identity and core business as a science-based organization. And although forging productive partnerships has been intrinsic to how CIP operates, the new SCP reflects a renewed commitment to working with existing and new networks of partners within CGIAR—particularly with external government organizations, nongovernmental organizations (NGOs), and private sector partners—to continue to transform science-based solutions into tangible outcomes and impacts.

Providing vitamin A to vulnerable populations.

Reducing Hunger and Vitamin A Deficiency in Malawi with the Resilient Nutritious Orange-Fleshed Sweetpotato

There is a great demand in Malawi for solutions to the country's persistent hunger, malnutrition and related health issues. Most of that landlocked East African nation's citizens survive on less than $2 per day and almost 60% of children under five suffer from vitamin A deficiency that can result in blindness. CIP works with the relevant government agencies, NGOs, and communities to develop, distribute, and promote the consumption of new drought-resistant orange-fleshed sweetpotato (OFSP) varieties with high levels of vitamin A, to reduce hunger and the risk of childhood blindness.

The project, called Rooting Out Hunger in Malawi with OFSP, is funded by Irish Aid and is part of CIP's 10-year, multi-donor Sweetpotato for Profit and Health Initiative (SPHI). It has promoted knowledge sharing, created a network of partners, and generated such great demand among farmers, government agencies and NGOs that a second phase was approved for 2014-2019. The project was presented as a success story at an international conference on Hunger, Nutrition and Climate Justice, in Dublin, Ireland in April of 2013 (See Transforming Smallholder

CIP's Strategic Objective 1

We will enable at least 15 million households (HH) to improve the quality of their diets and raise their crop incomes over the next 10 years in countries with micronutrient deficiencies in Africa and Asia as well as in Haiti. We will reach this goal by increasing the production and utilization of nutritious sweetpotato, starting with biofortified OFSP, a proven technology for reducing vitamin A deficiency (VAD) among women and small children. Responding to strong regional and national demand for more nutritious foods, we will work with our national partners to generate new, locally adapted and nutritious OFSP varieties. We will help our partners to scale-up use of these varieties through accelerated breeding, improved multiplication techniques, diversified value chain development, and evidence-based policies. We will establish strategic partnerships for going to scale and accompany this process with strategic research to assess cost-effectiveness, pro-poor focus, and gender inclusiveness. This Strategic Objective will contribute to five of the CGIAR Intermediate Development Outcomes (IDOs), particularly that of increased intake of nutritious food by vulnerable populations. This will also address all four System Level Objectives (SLOs), especially those of reduction in rural poverty and increased food security.

RTB Connection

In 2013, the CGIAR Research Program on Roots, Tubers and Bananas (RTB), in which CIP participates as lead center began to reorganize its program structure to increase impact. RTB scientists in all collaborating centers developed a framework for results-based management based on a set of discovery, delivery, and learning & support flagships that focused research on the highest priorities. Progress described above with OFSP was inspirational in developing the flagship concept. This is based on a central highly impactful flagship product and a number of supporting research products. The strategic objective for OFSP features as a delivery flagship in RTB together with analogous delivery flagships in banana, cassava, potato, and yams. For all these delivery flagships, research products were identified, impact pathways tentatively mapped out, and indicators for intermediate development outcomes (IDOs) constructed to provide the basis for enhancing impact. Hence the development of strategic objectives directly contributed to, and was also enriched by, the formulation of the RTB flagships. This is an illustration of how RTB can add value through broader collaboration building on the strong strategic plan developed by CIP.

Livelihoods with Bundles of Vines) and at the first International Conference on Global Food Security in Noordwijkerhout, Amsterdam, The Netherlands in October 2013.

The project, called Rooting Out Hunger in Malawi with OFSP, is funded by Irish Aid.

"Emphasis has been directed at developing the orange-fleshed varieties for dissemination, thereby increasing production and consumption of the vitamin A-rich sweetpotatoes," explains Dr. Felistus Chipungu, CIP's principal counterpart at the Department of Agricultural Research Services (DARS), Ministry of Agriculture and Food Security (MoAFS). DARS is a key partner in the project, as it is responsible for sweetpotato crop improvement. Five improved vitamin A-rich varieties were bred and released under the project and a sixth one that was already widely grown in Malawi was also selected for dissemination.

"The first-phase project target of reaching 70,000 households was attained several months before the end of the first four-years and has been surpassed

since then," observes Simon Heck, SPHI Deputy Program Manager, adding that by the end of 2013, more than 100,000 households were growing the crop thanks to the project. "Orange-fleshed sweetpotato has become a 'logical' choice for farmers, as it grows quickly and prolifically under most agro-ecological conditions; and its taste is popular, especially among children, those most vulnerable to malnutrition."

"The main constraint is to make good quality planting materials available to farmers," explains Heck, "so local farmers were trained to become 'vine multipliers' in order to improve availability of the materials at a community level, and those farmers were connected to sources of improved seed from national research stations and other primary multiplication sites."

A voucher scheme was designed to subsidize planting material, while improved skills and knowledge - such as a new technique of storage in dry sand, or intercropping sweetpotato with maize or soybeans – were included in research and training.

For Putri Ernawati Abidin, the Rooting Out Hunger Project Manager, training the trainers – agricultural extensionists and leaders of farmers' associations - was a key element of the the project's grassroots-level effectiveness and helped it gain full support from the implementing partners. Around 4,000 change agents – 43% of whom were female – were trained, and each of those trainers in turn trained an additional five to 10 people. Modules were designed on sweetpotato production, multiplication management, pests and diseases, post-harvest handling and processing, and small business skills. All these modules were aligned with the Scaling Up Nutrition (SUN) 1000 Special Days in Malawi that concentrates on improving nutrition during the critical period from conception to age two, and the Agriculture Sector-Wide Approach (ASWAp), which seeks to increase agricultural productivity, reduce hunger, improve diets and promote agro-processing income opportunities.

The project has become a model for its engagement in partnerships with government institutions and NGOs. It has also significantly increased the demand for OFSP in Malawi through an awareness-raising communication campaign that included radio programs, theater, recipes, songs sung at field and demonstration days, and even promotional messages printed on *chitenjes* – a cloth worn by local women.

"Let's not forget that many people, including women, don't have the opportunity to go to school in Malawi, resulting in high rates of illiteracy," explains Abidin. "When we started with the training in 2011, there were not many women attending. They were too shy to come because they could not read or write so we decided to rely on radio programs, drama and songs to disseminate our message. After this awareness campaign, more women participated."

The project undertook a household survey during the second half of 2013 that was compared to baseline data to measure impacts. That information will strengthen the second phase, which will also be funded by Irish Aid. Second-phase objectives include expanding into more districts and exploring opportunities for value-chain development to increase incomes and get OFSP-based processed products and cured roots with longer shelf lives into urban markets. More partnerships are needed, and CIP and its national research partners will focus on continued technology development, and on providing higher-level training and scientific advice.

Transforming Smallholder Livelihoods with Bundles of Vines

Fanny Mafuli and Dr. Putri Ernawati Abidin (CIP)

Fanny Mafuli, a farmer, wife and mother-of-three from Phalombe district, in southern Malawi, traveled to Dublin, Ireland in 2013 to tell an international audience how her life has changed since she began growing Orange-Fleshed Sweetpotatoes (OFSP).

Mafuli travelled to Dublin with Putri Ernawati Abidin, Rooting Out Hunger in Malawi with OFSP project manager, to participate in the conference on Hunger, Nutrition and Climate Justice held in April 2013. She told the audience how her family has benefited from a voucher scheme designed by CIP that allowed her to become an OFSP vine multiplier.

"I now have enough food, and I have increased the nutritional intake of my family, thanks to the orange-fleshed sweetpotato," she said in her presentation, which she gave in Chichewa, her native language.

Like many Malawians, Mafuli dropped out of school for financial reasons, married young, and became a subsistence farmer. During pregnancy, she was selected as one of the beneficiaries of Rooting Out Hunger's voucher program that provided her with healthy OFSP vines. She planted those vines during the 2010/2011 rainy season, when in addition to producing sweetpotatoes, she became a vine multiplier. She earned the equivalent of US $775 by selling vines through the voucher scheme during the 2011/2012 rainy season.

"I harvested enough sweetpotato to feed my family, and I sold some locally. I also managed to sell 15 bags of vines during the 2011/2012 rainy season," she proudly explained.

Mafuli is one of the 4,000 farmers who received training in vine multiplication and OFSP processing and utilization under the Rooting Out Hunger project. She also learned to produce an array of OFSP-based products such as fritters, bread, doughnuts, chips, mandazi, a one-pot dish, and a sweet beer called 'thobwa.'

Conference participants from various NGOs showed interest in the initiative's potential for replication in other countries with high levels of malnutrition and hunger. They were also impressed by the income opportunities it provides poor farmers through the sale of planting materials, fresh roots or OFSP-based products, or sweetpotato leaves for human or livestock consumption.

"With income from sweetpotato sales, women like me can support our families nutritionally, pay school fees, and buy school materials for our children. With profits from OFSP I bought two goats," Mafuli explained. "This project has changed my life."

Agile potato varieties fit into systems of the subtropical and temperate lowlands and diversify and intensify cropping systems.

Diversifying Economies and Improving Diets in Tajikistan and Uzbekistan

As climate change threatens agricultural production and the demand for arable land grows around the world, CIP works to develop potato varieties that tolerate environmental stress and produce tubers more quickly. Central Asia is an important region for this effort, and CIP collaborates with the national agricultural research systems (NARS) in several countries there to develop potato varieties that can improve food security and smallholder livelihoods, while contributing to national seed programs to reduce those countries' dependence on expensive seed imports from Europe.

The effort is beginning to show results in Tajikistan and Uzbekistan, where CIP and local scientists have made progress toward the development of potato varieties adapted to the region's long summer days, and with characteristics from CIP germplasm such as resistance to viruses and abiotic stress.

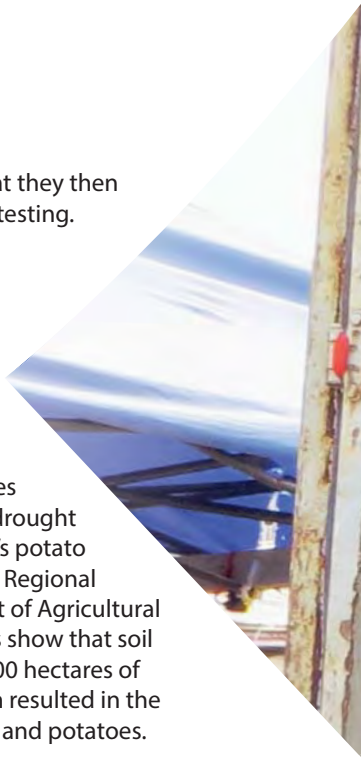
Potato farmers in Tajikistan and Uzbekistan, and other areas of the Aral Sea Basin, face challenges that include periodic drought, soil salinity resulting from years of bad irrigation practices, and heat, especially in the lowlands. CIP breeders cross *Solanum andigena* with *Solanum tuberosum* as part of an effort to produce potatoes that combine resistance to those abiotic factors with adaptation to temperate conditions and traits demanded by the market.

CIP's Strategic Objective 2

We will improve systems productivity and farm incomes of at least seven million HH in targeted Asian countries over the next 10 years. These improvements will be achieved through development and use of early-maturing agile potato varieties, thereby enhancing food security and providing an additional source of income. (By "agile" we mean varieties that can fit into windows currently left fallow in the different cereal-based systems of Asia and display the robustness derived from the intended desirable traits.) We will develop the necessary early-maturing varieties with traits resistant to biotic and abiotic stress, including those required by the market and processing industry, as well as those preferred for home consumption. Responding to strong regional and national demand for better adapted potato varieties and more nutritious foods, we will develop new, early, and extremely early multipurpose potato varieties that are locally adapted and robust. We will help our partners scale up the use of research products for accelerated breeding, improved seed delivery, diversification of value chains, and ecological management practices. We will establish strategic partnerships for going to scale and couple this process with outcome research to assess cost-effectiveness, ensuring a pro-poor focus and gender inclusiveness. We are mindful of inherent risks in agricultural intensification. Therefore, our integrative, interdisciplinary approach to research for development will contribute to the analysis and design of ecologically intensive, sustainable agricultural production systems involving potato in Asia. This Strategic Objective will contribute to the IDOs defined by CGIAR, particularly those related to increased and stable access to food, more gender-equitable income, enabling policy environment for gender-inclusive technologies, improved productivity, and increased consumption of nutritious food. By doing so, we will contribute to all four of the SLOs of CGIAR related to reduction in rural poverty, increased food security, improving nutrition and health, and more sustainable management of natural resources.

RTB Connection

RTB has included the agile potato as a flagship product in Southern and Central Asia. This is the second flagship identical to one of CIP's Strategic Objectives.



A remaining challenge for the breeders is a growing period of 90 days, since potato production in the region's lowlands requires a short growing season. The European varieties that these countries currently import produce tubers in 90 days or less, but they lack the virus resistance and tolerance of abiotic stress that CIP varieties offer.

Since CIP began work in Tajikistan in 2005, it has supplied the local NARS with improved potato germplasm materials that are adapted to the continental climate of Central Asia and have such desired traits as drought and heat tolerance. This is part of CIP's broader work in various Central Asian nations where it is supporting the development of new potato varieties and water management technologies to improve the productivity of smallholder farms.

"The primary aim of the project is to strengthen breeding systems and to select available genetic resources and incorporate them into productive varieties suited to stressful target environments," explains Merideth Bonierbale, CIP's Global Science Leader for Genetics and Crop Improvement.

> In the meantime, work continues unabated

This is being accomplished through a strategy called 'shuttle breeding.'

CIP sends seed to Tajikistan and Uzbekistan for testing and crossing with local and commercial varieties. Based on feedback from local partners, breeders at the CIP campus in Lima, Peru, reorient their breeding strategy and produce new germplasm that they then send back to Central Asia for further field testing.

"We will probably have success in the next generation of potato breeding within the country and develop a variety that suits the environment and the needs of the farmers," says Bonierbale.

This project is particularly important in Tajikistan and other Central Asian countries because abiotic factors such as heat and drought account for a loss of 35-40% of the region's potato yield each year. Data compiled by CGIAR's Regional Program for the Sustainable Development of Agricultural Research in Central Asia and the Caucasus show that soil salinization has affected more than 110,000 hectares of irrigated land over the past decade, which resulted in the loss of 17% of the gross harvest of cereals and potatoes.

"Over 200,000 families in Central Asia could benefit from potato varieties that combine stress resistance and faster production," explains Carlo Carli, CIP's Temperate Potato Program Leader. "These varieties can increase production and reduce risks of crop loss in our project areas with spillover effects into Pakistan, Afghanistan, northern China, Mongolia, the lowlands of Central Asia and the whole Caucasus region. Turkey, Iraq and Iran, where agro-ecological conditions are similar to those of Central Asia, might also adopt them."

Carli expects that the introduction of heat-, drought-, and salt-tolerant varieties of potato will move potato cultivation into non-traditional growing areas and further improve food security for even more resource-poor farmers.

In the meantime, work continues unabated with local breeders and partners in Tajikistan and Uzbekistan. While the first varieties of precocious potatoes bred for the region should be ready within the next growth cycle, CIP's efforts to reach the potato's full potential for Central Asia have just begun.

Selling potatoes in the Central Market of Tashkent, Uzbekistan

Increase potato productivity and improve the livelihoods of farmers in Africa.

Transferring Germplasm and Technology for Better Livelihoods in Ethiopia

Ask Gebremedhin Woldegiorgis, Senior Researcher for the Ethiopian Institute of Agricultural Research's (EIAR) Potato Team, what he is most proud of professionally and he won't hesitate to say, "The transfer of technology to farmers. This is changing their lives."

CIP has collaborated with EIAR on efforts to improve the lives of Ethiopian farmers for more than 30 years, but that partnership gained new momentum in 2009, when CIP opened an office in Addis Ababa, the Ethiopian capital. In recent years, CIP has sent potato germplasm from its Lima headquarters to Ethiopia as *in vitro* plantlets and botanical seed that EIAR staff screen at different locations across the country.

At the main EIAR research center in Holetta, about 30 kilometers from Addis Ababa, scientists and technicians work on various projects to improve farmers' lives. With CIP support, the Potato Team has focused on seed management, clean seed production using aeroponic and sand hydroponic technologies and the development of improved varieties.

CIP's Strategic Objective 3

The overall goal of Strategic Objective 3 is to significantly increase potato productivity and improve the livelihoods of at least 600,000 smallholder farmers in potato-growing regions of Africa by the use of high-quality seed of robust, market-preferred and biofortified varieties. Multiplier effects will benefit an additional three million HH. This Strategic Objective aims to improve quality and access to seed potato tubers, or "seed," of improved varieties by integrating rapid multiplication technologies (RMTs) with decentralized seed production and on-farm seed maintenance. A key element of this approach is private sector involvement to create entrepreneurial opportunities for young and female farmers. This will eventually boost the supply of quality, affordable seed to smallholder farmers.

RTB Connection

This is the third flagship for RTB which corresponds to a CIP Strategic Objective. RTB is also supporting a broader program of work on seed systems for RTB crops which, because they are all clonally propagated, shared major commonalities, opening up an area for mutual learning looking at developing capacity in seed technology and business models, ensuring on-farm seed quality maintenance and locally-adapted tools and protocol for seed quality control. In Ethiopia, as in other developing countries, RTB also seeks to encourage the creation of knowledge and information platforms that will help with seed market intelligence and demand creation.

Diffused-light storage in Ethiopia.

"We are looking at adaptability, late-blight resistance, high yields, and processing quality," Gebremedhin explains.

EIAR's Potato Team works directly with the country's abundant cooperatives. New potato varieties are released to them after two or three generations of multiplication at the research center. Over the past 30 years, EIAR has released about 30 varieties in the country.

Cooperative farmers and staff from the Ministry of Agriculture also receive training in seed quality management based on the FAO/CIP guidelines for quality declared planting materials. With support from USAID, CIP and the EIAR Potato Team adapted those guidelines into a manual for Ethiopia's potato growers. They then solicited feedback and incorporated it into the document before getting it translated into Amharic, the national language. A Ministry of Agriculture task force is now prepared to adopt those revised guidelines at the national level.

Plenty of Ethiopian farmers can attest to the effectiveness of the CIP-EIAR collaboration. One of them is Guta Gudissa, a potato grower in Jeldu, in the country's central highlands, who was profiled in CIP's 2008 annual report. He is doing even better today, renting land to increase his potato production and providing work for many day laborers.

Gudissa is one of several hundred 'model farmers' who have left cooperatives to start their own businesses and now serve as conduits for the dissemination of improved varieties and technologies. He stores his potatoes in diffused-light storage (DLS) units that he built following technical advice from EIAR and CIP. DLS units are now a common sight in Jeldu and other potato producing areas, where the technology has been widely adopted by cooperatives and independent farmers alike.

"It has been a most successful cooperation with CIP," says Gebremedhin, adding that the Institute has received recognition from the country's highest levels. The EIAR Potato Team received a Meritorious National Achievement Award from the government in October 2013 in a ceremony attended by the Prime Minister. EIAR has also been selected to host the 10th Tri-Annual Conference of the African Potato Association, which will be held in Ethiopia in 2016.

CIP and EIAR are scaling up their work together, as evidenced by the construction of two new screen houses at Holetta and another research center in northern Ethiopia. They will be used for varietal development under the supervision of Asrat Amele, CIP's regional potato breeder for Eastern Africa.

"The collaboration between EIAR and CIP has been exceptionally fruitful and productive, leading to visible changes on the ground among Ethiopian potato farmers," confirms Steffen Schulz, who heads CIP's Ethiopia office. "This can be attributed to the strength and dedication of the staff of the National Potato Program and the willingness of the Ethiopian government to invest in agricultural research and development."

"The potential of root and tuber crops in general, and potatoes in particular, for improving food security and incomes was long overlooked in this cereal-growing country," Schulz explains. "Having demonstrated the impact that roots and tubers can generate, this is now changing. Roots and tubers are increasingly recognized as priority crops."

"It has been a most successful cooperation with CIP," says Gebremedhin

Novel technology with great potential for significant impact on food security.

Investing in Science for the Breakthroughs Needed to Meet the World's Growing Food Needs

Jan Kreuze holds a small, tube-like container between his thumb and forefinger. It is a mini-array that a seed producer or phytosanitary agent can use to identify pathogens present in sweetpotato seed by placing tissue in it and taking a photograph with a smartphone camera. The image is read by an app that analyzes the intensity of spots, and can let the farmer know whether or not seeds have viruses in real time. "This is an innovation that provides farmers with information that is extremely valuable to their success," says Kreuze. "It's also not costly to the user, which is critical because cheaper overhead costs mean cheaper virus-free products."

The technology is an example of CIP's efforts to develop next-generation diagnostics that can be used by smallholder farmers and extension agents to quickly and inexpensively identify crop diseases or pests in the field before they become a problem. Such diagnostic tools are one of five game-changing solutions that CIP scientists have identified under objective four of the strategic plan: to "Accelerate the Discovery of Game-Changing Solutions for Enhancing Food Security."

CIP's Strategic Objective 4

This Strategic Objective expands on CIP's decades of knowledge and practice as a research and development organization committed to scientific rigor and inquiry. It exploits recent, evolving discoveries in genetics, molecular biology, genomics, bioinformatics, nanotechnology, plant-pathogen interactions, disease control, developmental biology, and cellular biology. By taking advantage of multidisciplinary approaches, this Strategic Objective will achieve five game-changing solutions: research outputs that respond to a major agricultural problem and are delivered as a novel technology with great potential for significant impact on food security. Two of the solutions—a potato with durable resistance to diseases, and a sweetpotato with pest resistances—offer the potential of massive productivity gains through the use of the most elite germplasm and the introduction of multiple genes. Strategic Objective 4 will explore three other game-changing solutions: (1) expanding the cultivation of potato toward warmer and drier land, (2) next generation of pathogen diagnostics and disease risk prediction, and (3) new true potato seed technology. These efforts build on "discovery" research that aims at reaching a proof-of-concept (PoC) stage in these game-changing solutions after which new Strategic Objectives will be developed. Collectively, such solutions will position CIP with new flagship products well into the next decade. Strategic Objective 4 will play a role in prospecting new discoveries to add new game-changing solutions if supported by sufficient scientific evidence.

RTB Connection

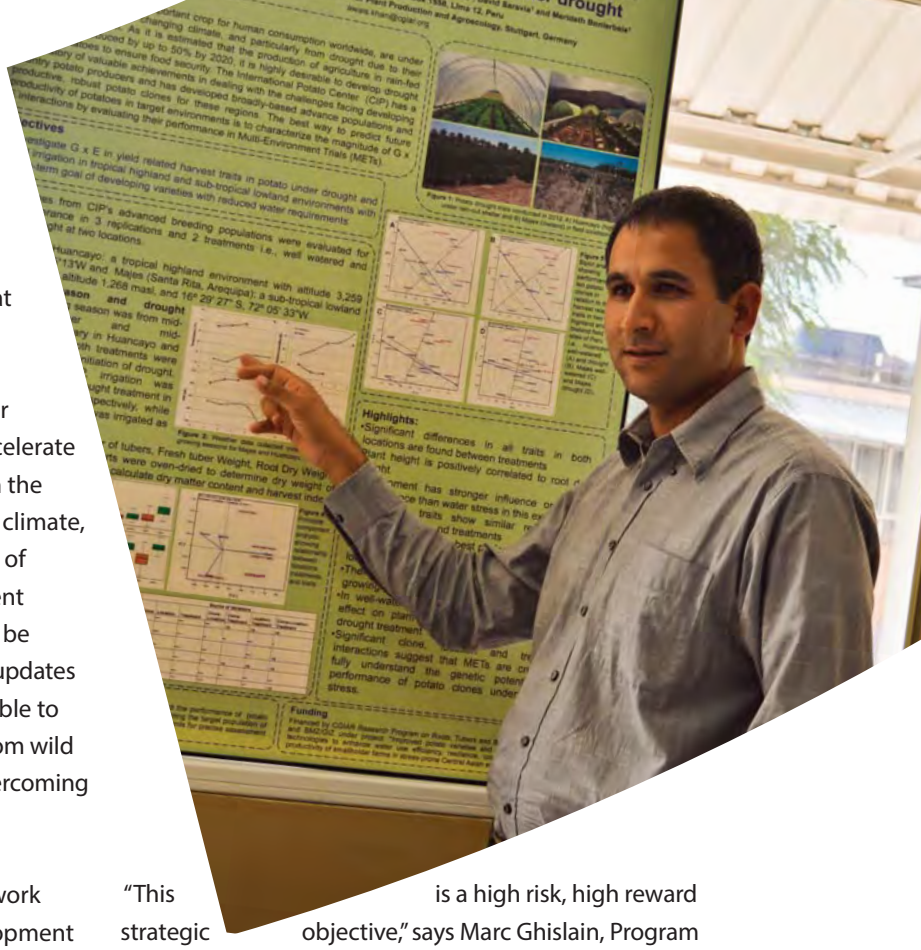
In 2013 the RTB team developed the concept of "discovery flagship" to foster longer-term, more upstream research that could potentially have dramatic positive impact on food security. One flagship seeks to build an RTB transformational breeding platform utilizing genomics, metabolomics, and phenomics; the other aims to develop genetically improved RTB varieties with game-changing traits based upon genetic modification and gene editing. So a substantial part of this strategic objective can be mapped into the RTB flagship of game-changing traits. There are issues common to game-changing traits in all RTB crops such as managing intellectual property and stakeholders' perceptions, and supporting biosafety regulatory frameworks. In some cases, such as developing RTB crops with resistance to bacterial diseases, there are gene constructs and gene targets for mutagenesis common across different crops. So RTB planning and CIP planning are mutually reinforcing.

The mini-array is just one of various innovations that Kreuze and his team are working on to improve field diagnostic capabilities in the developing countries and remote areas where CIP works. Most of these technologies are developed keeping in mind using easy to find, cost effective materials to ensure sustainability. Even smart phones have become more common in the regions where CIP is active, and they have become cheaper as well. CIP also supports laboratory and distribution-hub diagnostic needs and tools, but the current focus on field-based diagnostics that are inexpensive and accessible to users with minimal knowledge of technology is a priority for Kreuze.

In its 42-year existence, CIP has used basic science research to achieve important innovations and discoveries for controlling pests and diseases and increasing productivity of potato and sweetpotato in many developing countries. But science is changing rapidly, and CIP needs to keep up with that change, and harness the latest developments for the purpose of its mission. While the encyclopedia of knowledge compiled at CIP is vast and valuable, innovations in bioinformatics, genome sequencing and genetics have accelerated the potential for discovery in ways unimaginable until a few years ago.

"This is a high risk, high reward strategic objective," says Marc Ghislain

"CIP's strategic plan depends on our ability to stay current with innovations going on outside of CIP and to adopt those that can be applied to our crops and new objectives," says Awais Khan, a CIP geneticist



on adaptation and abiotic stress tolerance based in Lima, Peru. Khan stresses the role that scientists must take as they look outside their organization to discover who has expertise in genome sequencing or bioinformatics or other fields, and build partnerships with them to accelerate CIP's research and development pipeline. With the drastic effects on production from a changing climate, it will be increasingly important to stay on top of new research findings to allow the development of potatoes with a broad adaptability that can be brought directly to the field. "Using the recent updates in genomics and biotechnology, we are now able to quickly introduce traits of consumer interest from wild potatoes into preferred cultivated varieties, overcoming the long time traditional breeding requires."

Other game-changing solutions that CIP will work toward in the coming years include the development of disease-free, ecosystem-flexible potatoes and pest-free sweetpotatoes – technologies that could make major contributions to food security and nutrition. All agricultural scientists have contemplated such holy grails as a disease-free potato, but pragmatism forces them to focus on discreet issues such as drought tolerance or late blight resistance. However, CIP has taken on these challenges because its leaders recognize that success in achieving them would vastly benefit smallholder farmers, whereas advances along the way to those goals will strengthen other aspects of CIP's food security agenda.

While some of the technologies that CIP researchers focus on are quick wins, CIP realizes that a long view is also required to face the vast challenges posed by trends such as population growth and climate change. As Hannele Lindqvist-Kreuze observes a "truly disease free potato could take decades to achieve," but it is nevertheless worth working on. As she explains, "we are focusing on the most important potato diseases: late blight, bacterial wilt and the most common potato viruses, and the idea is to combine the resistances that one particular locality requires." The focus is to develop disease-free varieties for targeted areas where achieving food security is a priority.

"This is a high risk, high reward strategic objective," says Marc Ghislain, Program Leader for Genomics and Biotechnology Global Science, as he explains why CIP's focus on these aspects of basic science are so different from the other agriculture and development objectives in the Strategic and Corporate Plan. "This is needed, because we cannot sit back and wait for the rest of the world to develop the technology that we need for our end users because this may never happen."

Nevertheless, Ghislain observes that to be successful, CIP will have to partner with academic research institutes and private companies at the forefront of genomics, bioinformatics, transgenics, and genome editing. "Certainly, the local private sector will be needed to deploy our technologies when they are ready, but in the meanwhile, there are some high-tech companies in developed countries that can help us accelerate the discovery of our future products."

Ghislain goes on to explain that CIP is uniquely positioned to be successful in these efforts. Few other organizations focus on smallholder farmers and even fewer focus on potato and sweetpotato. Moreover, CIP has been very selective in the choice of products to focus on.

"We have solid evidence that we can be successful," says Ghislain.

Identifying "hotspots" of food vulnerability.

The Chirapaq Ñan Initiative: Monitoring Potato Genetic Diversity in the Field

Following the domestication of the first potatoes some 7,000 years ago, indigenous farmers across South America's Andes and the Chiloé Islands selected thousands of landraces that continue to be grown and consumed today. While a few of them have been used in crop improvement, resulting in bred varieties that are grown around the world, most landrace potatoes and proximate wild crop relatives are found only in or near their region of origin. Trends such as global warming, globalization and consequent changes in pest and disease pressure, rural-urban migration and other factors are commonly believed to threaten genetic diversity, but without baseline information about diversity in the field, it's impossible to know whether loss of genetic diversity (genetic erosion) really occurs.

Scientists in CIP's Genetic Resources Global Science program have launched an innovative initiative to document potato genetic diversity at a series of hotspots (areas of high landrace diversity) scattered across the Andes and Chiloé, and to work with local NGO's, national programs, universities, municipalities and farmers to systematically monitor the species,

CIP's Strategic Objective 5

Strengthening food security is the most recent addition to CGIAR's new set of high-level objectives, an emphasis that stems largely from recent crises in both food prices and global food security. Yet the dimension that has been least explored or operationalized is stability or vulnerability—that is, changes in food availability, food access, and food utilization caused by socioeconomic or environmental stresses and shocks. This Strategic Objective seeks to operationalize the dynamic concept of food vulnerability in the context of agricultural research and development, develop a framework for its analysis, and design resilience interventions. The Strategic Objective analyzes food vulnerability and assesses and designs intervention research to reduce vulnerability through the five stages of the pro-poor research and development cycle. The model also includes crosscutting products related to gender, partnerships, capacity development, monitoring and evaluation, and learning. Initially, Strategic Objective 5 will focus interventions in the Andes and in Asia. In the midterm, and following advances in the proof-of-concept stage, these system-level approaches will be applied to the many vulnerable systems confronted by CIP's region-wide programs in Africa.

RTB Connection

In 2013, RTB supported a meeting of scientists working on *in-situ* conservation of potato, cassava, sweetpotato, yam and bananas in their centers of origin. They developed a research proposal for a "Global network of RTB in situ conservation monitoring sites". This global initiative, which aims to generate evidence about the conservation status of landraces and wild relatives, and sustain ecosystem services and benefits for custodian farmers, will involve the participation of all research centers in charge of implementing RTB (CIP, Biodiversity International, CIAT, CIRAD and IITA). This will form an important element of both the strategic objective of CIP and the discovery flagship on *in-situ* conservation of RTB.

landrace, genetic and spatial diversity of potato, and related collective knowledge. Called Chirapaq Ñan ("Rainbow Route" in Quechua), the initiative aims to systematically monitor potato agrobiodiversity in situ (in the field) and to develop a platform for studying the long-term conservation dynamics and model what might happen to that biodiversity in the future. At the same time, the initiative seeks to improve the well-being of the smallholder families that are the custodians of ancestral varieties through benefit-sharing practices.

"In the era of globalization and climate change, the idea is to take the pulse of the genetic diversity of native species and varieties, something that has already been done for wildlife flora and fauna, for example, by the International Union for Conservation of Nature, but which has not been done for such an important specific food crop as the potato," explains Stef de Haan, CIP's leader of Genetic Resources.

So far, de Haan and his team have identified eight potato diversity hotspots in six South American countries where CIP will work in partnership with local organizations and farmers to monitor agrobiodiversity conservation dynamics. Potato farming communities are the main protagonists in this process, especially the 'potato custodian' or 'guardian' farmers who cultivate and conserve the landraces they inherited from their ancestors.

CIP and partners began work at four hotspots in 2013: two in Peru, one in Bolivia and one in Chile. The plan is to include hotspots in Argentina, Colombia and Ecuador in 2015, in order to extend the Rainbow Route across the Andes. The selection of hotspots was made taking into account the geographic distance between them, thereby increasing the possibilities of obtaining greater and more distinct diversity. Other factors considered included the presence of diverse landraces, crop wild relatives, different language groups (Quechua, Aymara, Mapuche, Spanish), perceived threats, and strong grassroots partners.

The Chirapaq Ñan Initiative depends on the participation of multi-stakeholder networks that include public institutions, scientists, local professionals, and the farmers themselves. Eight local

consortia have been identified in six Andean countries that will work with small groups of approximately 150 families each. Although potato diversity is expected to differ widely among the different countries and consortia, de Haan hopes that long-term partnerships will be formed among the participating organizations and communities to share experiences and information, such as robust and practical methods, distribution ranges, and red lists of fingerprinted landraces. The initiative publishes newsletters to facilitate stakeholder communication within the network and is producing an educational DVD.

One of the first steps for each hotspot is to establish a baseline of potato diversity, abundance and distribution. The research methods to be used in the communities were developed at a meeting in Huancayo, Peru, in November of 2013. Local youth were trained, and they conducted participatory mapping in six communities in Huancavelica, Apurimac and Pasco, Peru. The landrace distribution was measured and farmers' potato plots were located on high-resolution satellite images. Baseline catalogues with photographs, morphological descriptors, genetic fingerprints and ethnobotanical information are generated for each hotspot.

While germplasm from species and landraces growing in the hotspots was collected years or decades ago and is preserved *ex-situ* in the CIP genebank, de Haan and his team are analyzing genetic data to identify gaps in that collection. A single DNA sample was taken from one representative plant from each farmer-recognized landrace. Germplasm from 21 participatory on-farm characterization trials in Bolivia and Peru was evaluated morphologically and genetically and photo-documented. Between 15 and 120 landraces were registered per trial for a total of 1,021 accessions in 2013. In 2014, this amount will be doubled.

At the same time, Chirapaq Ñan is documenting collective knowledge of landraces, and promoting knowledge-sharing among participants. Rural schools are involved in documenting local knowledge with community elders and in incorporating it into a formal curriculum, which will facilitate monitoring future loss

LA RUTA DEL ARCOIRIS
CHIRAPAQ ÑAN

Farmers in the Andes sort the 2013 harvest of native potatoes.

or enrichment. The NGO partners CADEP José María Arguedas, HoPe, Foundation Peru-Netherlands and Yanapai are collaborating with three communities in the Peruvian departments of Apurímac, Cusco and Huancavelica on the development of an interactive, bilingual education guide for local schools under an agreement with Peru's Ministry of Education.

"The idea is to promote the transfer of knowledge from one generation to the next," explains Severin Polreich, an Associate Scientist in Genetic Resources who coordinates the initiative with de Haan. "We seek to ensure that the collective knowledge remains there, at the local level, and that the young people are actively involved."

In addition to the Peruvian partners mentioned above, the Chirapaq Ñan stakeholder network currently includes the Colombian government institution CORPOICA, Ecuador's INIAP, Bolivia's Universidad del Alto and INIAF, the Universidad Austral de Chile and the Chilean institutions INIA, CET and PRODESAL.

The Chirapaq Ñan team has prioritized making their research gender-responsive, with help from CIP's gender experts. De Haan observed that there are strong gender roles in the conservation, use and transfer of knowledge of potato landrace diversity. He explained that while traveling through the island of Chiloé, Chile, in March of 2013, he noticed gender differences in attitudes toward potato landraces. Chiloé is the place of origin of the diverse and commercially important *Solanum tuberosum Chilotanum* group, yet many farmers are planting improved varieties there. De Haan noticed that whereas the men were in favor of replacing native potatoes with improved varieties, the women didn't want to abandon the native species because of the flavor and their experience cooking them. Some women farmers opted to grow improved potatoes in one furrow and landraces in another.

For María Scurrah, a member of the Peruvian NGO Yanapai, one of the many Chirapaq Ñan partners, the initiative's approach to cultural and social factors is just as important as its focus on genetic diversity. "I believe that at the end of the day, we are trying to help the poorest sector, since it is the poorest people who are conserving the biodiversity," she says.

In the future, Chirapaq Ñan plans to improve the well-being of smallholder potato farmers through options such as facilitating access to health insurance or scholarships for school children. Researchers won't manipulate potato biodiversity, which is the research subject, but will provide indirect incentives for households participating in the initiative.

"The International Treaty on Plant Genetic Resources for Food and Agriculture sets down the rights of farmers, but implementing them has always been the most complicated part," de Haan observes. "Chirapaq Ñan is looking for positive changes."

So far, de Haan and his team have identified eight potato diversity hotspots in six South American countries

Conserving genetic diversity with CIP's genebank.

Representatives of Potato Park Community visit CIP's Lima Campus

Pachamama, or Mother Nature, plays a dynamic role in Andean culture, and the vitality of this tradition was on display at CIP's Lima Campus on October 25, 2013, when 30 farmers from Pisac, a town near the ancient Incan capital of Cusco, Peru, arrived in their traditional dress to celebrate Pachamama, and CIP's contributions to ensuring that future generations benefit from her bounty.

The main reasons for the group's visit were to exchange native potato germplasm and to celebrate their long-standing relationship with CIP. Pisac is one of six Quecha-speaking, indigenous villages in the Potato Park: a unique, community-managed protected area that covers more than 12,000 hectares where about 600 native potato varieties are grown. CIP has been collaborating with the Potato Park communities since 2004, and during that time, CIP scientists have helped them to repatriate native potato cultivars that had disappeared from their area, but were preserved *in vitro* in CIP's state-of-the-art Genebank.

Over the past decade, CIP and the Potato Park communities have developed a relationship based

CIP's Strategic Objective 6

Conserving genetic diversity, with CIP's genebank as a central element, is essential to the success of all other CIP Strategic Objectives. It supports and enables the expedient use of diverse genetic building blocks and associated information to ensure global productivity of healthy, abundant, and secure food. It facilitates the impact-oriented release of strategically placed CIP innovations and products by the conservation and use of the rich global biodiversity of potato and sweetpotato. The genebank holds more than 21,000 accessions of potato, sweetpotato, and Andean root and tuber crops (ARTCs) and includes cultivated, wild, and breeding lines. Our collection of ARTCs (i.e., oca, ulluco, mashua, achira, yacon, arracacha, ahipa, maca, and mauka) represents the only secure long-term global collection of these crops that could hold unique invaluable genetic, physiological, and biochemical attributes. These collections serve as a model for global and national genebanks through innovative research, advanced public database designs, and interactive genomic use of the collections. Genomic fingerprinting allows scientists to identify the diversity of these accessions rapidly and conclusively. Similarly, complete characterization of every accession provides an assessment of diversity and use through genetic and phenotypic correlations. The capture, generation, discovery, and compilation of trait-associated information will greatly aid in food security in a changing environment through disease and insect resistance as well as drought, cold, and heat tolerance. Use of next-generation sequencing will provide the baseline information needed to facilitate the identification of genes and quantitative trait loci, and to develop marker-aided selection options in order to better mine and use the diversity in the collections.

The genebank will enhance the conservation and availability of valuable diversity through further rationalizing of global national collections. It will facilitate the use of germplasm currently not under the International Treaty for Plant Genetic Resources for Food and Agriculture (PGRFA). This Strategic Objective supports strategic collecting to supplement the collection and the building of on-farm conservation through partnerships with farmers for *in-situ* conservation. Through collaborations with a wide spectrum of next and end users, CIP's genebank will maintain its world-class reputation for excellence, transparency, expertise, and germplasm management to sustain future global food productivity and security.

Genebank CRP Connection

The Plan for Partnership for Managing and Sustaining CGIAR-held Collections resulted in the signing of an Agreement between the Global Crop Diversity Trust and the CGIAR Consortium to form Genebank CGIAR Research Program (CRP). The genebank CRP supports the maintenance and distribution of the In Trust potato, sweetpotato and Andean Root and Tuber collections. Included also is the collection of data about the accessions and the development of systems to aid users in utilizing these accession-specific data to support research and breeding programs aimed at increasing food productivity and security. A major portion of this strategic objective aims at increasing the level and accessibility of information for potato and sweetpotato collections globally.

on mutual respect and dedication to Pachamama. CIP scientists have provided the farmers with germplasm and training while learning from their traditional knowledge and spiritual relationship with Mother Nature.

> The farmers from Pisac were happy to receive their most precious potato lines.

The group from Pisac traveled to Lima by bus and arrived at CIP in rainbow colored ponchos and intricately decorated skirts, lending the research center a festive air. They toured the CIP Genebank and partook in day-to-day activities such as recording potato samples and preparing cultivars for storage, then they participated in workshops on pollination and true potato seed production. Spanish and Quechua were spoken in unison as the farmers and scientists discussed subjects ranging from potato pests and diseases to the most delicious potato varieties. To watch the colorful group of visitors interacting with the research center staff was to witness two different potato realities drawn harmoniously together.

The main reason for the group's visit was to deliver some of their most precious potato cultivars for virus cleaning and safekeeping at the CIP Genebank, and to pick up virus-free plantlets of other native varieties for cultivation at the Park. CIP has helped communities throughout Peru over the past 15 years with its dynamic potato repatriation program. This includes the conservation of cultivars and the reintroduction of lost potato lines, disease free, to communities in the Andean highlands. Due to the terrorism that Peru suffered in the 1980s and '90s, vast potato-producing areas were abandoned, leading to the loss of numerous native potato lines. Since CIP began collecting potato cultivars for the Genebank in 1971 many of those potato varieties "lost" to Andean communities have been returned.

CIP ensures the conservation of diverse cultivars in the Genebank, and gives communities the chance to deposit their precious potato lines in the bank, and to request disease-free plantets of those varieties when needed. Potato Park communities gave CIP 150 cultivars two years ago, and the success of that experience led to them to deliver another 100 cultivars in October for safekeeping and cleaning.

The process of cleaning potato cultivars of viruses can take up to four years from *in vitro* growth to virus eradication. It begins with the reception of materials, after which scientists analyze the genetic traits of each cultivar to ensure they aren't replicates of accessions already housed in the Genebank. The scientists then grow *in vitro* plantlets from the accessions and screen them for viruses.

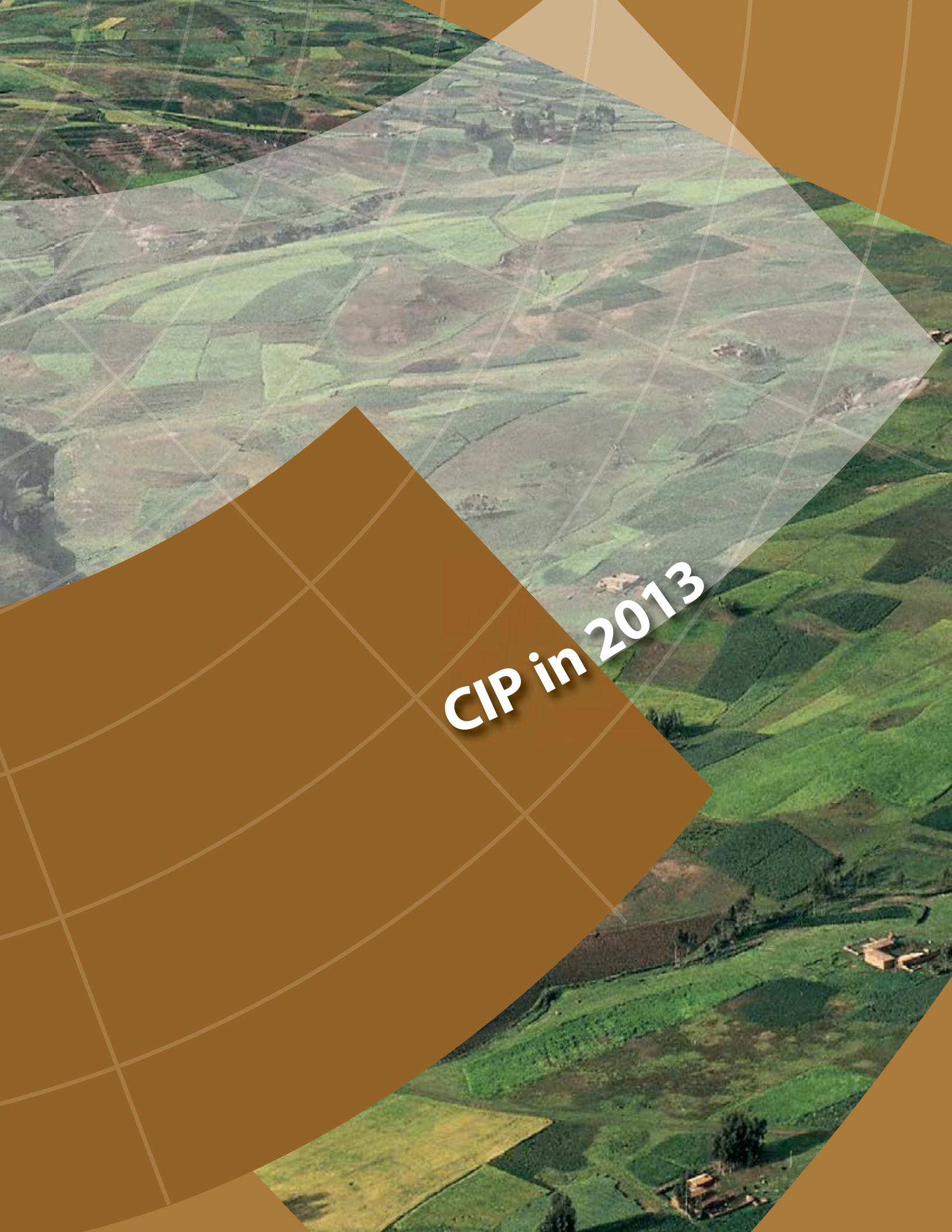
"The vast majority of potato plants grown in the field contain viruses, and these viruses are painstakingly eliminated using thermotherapy," explains Rene Gomez, the native potato curator at CIP's Genebank. Thermotherapy exposes an infected potato plantlet to increased heat, which halts virus reproduction but allows the potato plantlet to grow. After two or three months, specialists cut off disease-free shoots – often measuring 1/5 of a millimeter – from the plantlet and grow them *in vitro*.

Scientists then retest these for viruses, and store clean *in vitro* plantlets in the Genebank for safekeeping and eventual return to the community that supplied the cultivar.

The farmers from Pisac were happy to receive virus-free versions of their most precious potato lines, and their enthusiasm was evident during the ceremony held in the CIP auditorium. The event began with an offering to Pachamama by a Shaman from the potato park. A community leader then officially handed over the native cultivars for preservation to CIP Director General Pamela Anderson, who then gave the community a number of clean, *in vitro* plantlets of cultivars collected by CIP over 40 years ago. The ceremony closed with folk music and dances, as Anderson and a number of CIP scientists took turns on the dance floor with the visitors.

For this group, potatoes represent not only the basis of their livelihood, but also an intrinsic part of their cultural identity. While the community is thankful to CIP for its support, CIP is also grateful to the community for their trust and for helping to ensure that their prized potato lines are never lost.

Traditional knowledge preserved through community efforts.



CIP in 2013

CIP is a progressive, responsive and formidable agricultural research and development organization.

Dr. Rodney Cooke - Chair Board of Trustees

Board of Trustees and Executive Committee

From left to right: Dr. Simon Best, Dr. Bir Pal Singh, Dr. Peter VanderZaag, Dr. Stella Williams, Dr. Pamela K. Anderson, Dr. Rodney Cooke, Dr. Arturo Flórez, Mr. Patrick Murphy, Mr. Andrés Casas

1. Amalia Perochena • 2. Oscar Ortiz • 3. Xiaoping Lu • 4. Michael Gerba • 5. David Theriault • 6. Pamela K. Anderson • 7. Ulrika Martinius

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Xiaoping Lu

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CCCAP

Xiaoping Lu, Deputy Director General, CCCAP
Jim Gradoville, Deputy Director, CCCAP

Roots, Tubers and Bananas

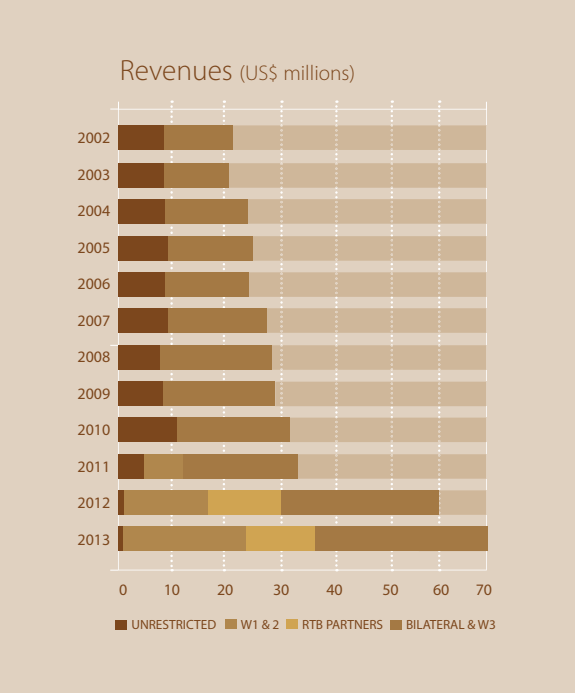
Graham Thiele, Director, CRP

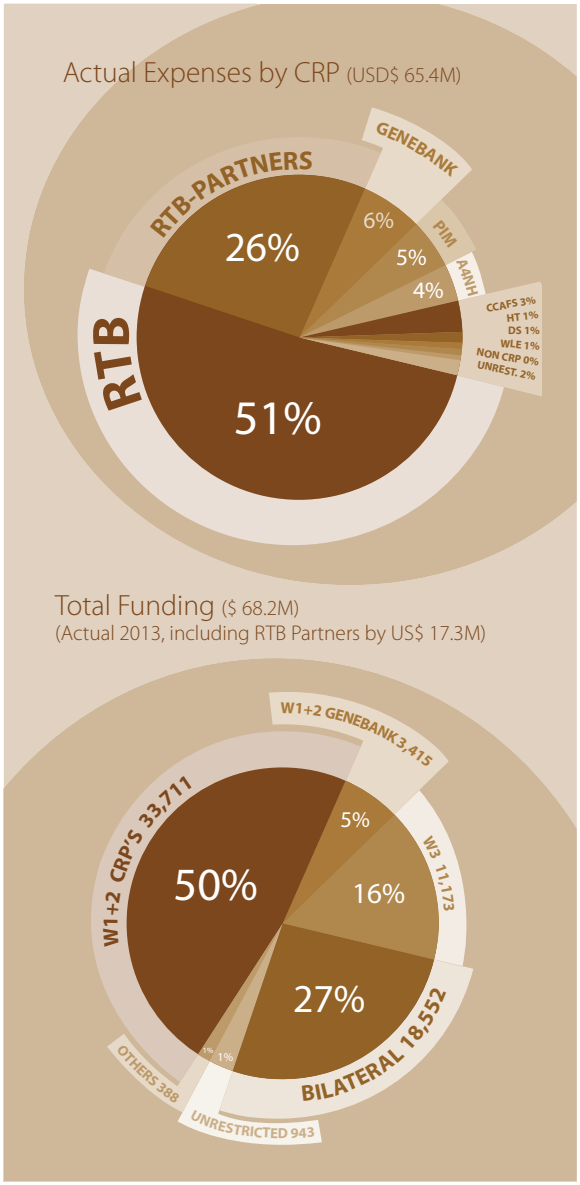
Financial Report

The International Potato Center's good financial health and impact on the ground continued in 2013. The established internal controls and risk management framework across the organization earned the International Potato Center an unqualified audit opinion from Ernst & Young, Peru.

Revenue in 2013 increased 18% from 2012 to $68.2 million (2012: $57.3 million). Financial support for our research portfolio encompasses a wide variety of donors including; governments, foundations, corporate and private supports with the majority of our research funding coming now through our participation and membership in the CGIAR Research Programs.

The International Potato Center during the course of 2013 approved a new 10-year Strategic and Corporate Plan which calls for substantial growth over the next 5-10 years. This growth will be realized through innovative research and the scaling out of existing technologies.





CIP's Statement of Financial Position and Statement of Activities as of December 2013 is presented in the table below. A copy of the complete audited financial statements may be requested from the office of the Chief Financial Officer at CIP headquarters in Lima, Peru.

Statement of financial position year ended 31 December 2013 (US$ 000)

ASSETS	2013	2012	LIABILITIES AND NET ASSETS	2013	2012
Current Assets			**Current Liabilities**		
Cash and cash equivalents	3,166	11,003	Accounts Payable		
Investments	18,857	21,132	Donors	11,337	15,750
Accounts Receivable:			Other - CGIAR Centers	6,471	15,253
Donors	1,582	2,701	Employees		263
Other - CGIAR Centers	6,040	8,199	Others	4,759	5,321
Allowance for doubtful accounts		(1,336)	Accruals and Provisions	92	194
Employees	394	148	**Total current liabilities**	**22,659**	**36,781**
Others	713	268	**Non-Current Liabilities**		
Inventory	519	475	Employees	2,006	1,454
Advances	3,575	3,969	Accruals and Provisions	599	527
Prepaid Expenses	690	379	**Total non-current liabilities**	**2,605**	**1,981**
Total current assets	**35,536**	**46,938**	**Total liabilities**	**25,264**	**38,762**
Non-Current Assets			**Net Assets - Unrestricted**		
Investments	63	51	Designated	5,778	5,778
Property and Equipment, net	6,393	5,675	Undesignated	10,950	8,124
Total non-current assets	**6,456**	**5,726**	Total net assets	16,728	13,902
TOTAL ASSETS	**41,992**	**52,664**	**TOTAL LIABILITIES AND NET ASSETS**	**41,992**	**52,664**

Statement of Activities year ended 31 December 2013 (US$ 000)

	Unrestricted	Restricted - CRPs CGIAR Fund				Restricted - Other		Total	Total
		Windows 1&2	Window 3	Bilateral	Total	Bilateral	Total	2013	2012
Revenue and Gains									
Grant Revenue	4,412	37,126	7,704	18,495	63,325	57	57	67,794	56,545
Other Revenue and Gains	388	-	-	-	-	-	-	388	761
Total Revenue and Gains	**4,800**	**37,126**	**7,704**	**18,495**	**63,325**	**57**	**57**	**68,182**	**57,306**
Expenses and Losses									
Research Expenses	792	33,301	6,772	16,525	56,598	49	49	57,439	49,737
General and Administration Expenses	7,891	-	-	-	-	-	-	7,891	6,104
Other Losses	26	-	-	-	-	-	-	26	1,336
Subtotal Expenses and Losses	8,709	33,301	6,772	16,525	56,598	49	49	65,356	57,177
Indirect Cost Recovery	(6,735)	3,825	932	1,970	6,727	8	8	-	(72)
Total Expenses and Losses	**1,974**	**37,126**	**7,704**	**18,495**	**63,325**	**57**	**57**	**65,356**	**57,105**
NET SURPLUS/(DEFICIT)	**2,826**	**-**	**-**	**-**	**-**	**-**	**-**	**2,826**	**201**
Expenses by Natural Classification									
Personnel	9,381	7,348	1,971	5,128	14,447	-	-	23,828	18,763
Supplies and Services	(2,097)	6,870	1,682	5,537	14,089	33	33	12,025	13,276
Collaborators - CGIAR Centers	-	17,306	-	-	17,306	-	-	17,306	13,218
Other Collaboration	-	428	2,465	4,168	7,061	-	-	7,061	6,038
Travel	802	1,168	602	1,390	3,160	16	16	3,978	3,473
Depreciation	613	181	47	286	514	-	-	1,127	2,399
System Cost (CSP)	10	-	5	16	21	-	-	31	10
Sub-Total	8,709	33,301	6,772	16,525	56,598	49	49	65,356	57,177
Indirect Cost Recovery	(6,735)	3,825	932	1,970	6,727	8	8	-	(72)
Total	**1,974**	**37,126**	**7,704**	**18,495**	**63,325**	**57**	**57**	**65,356**	**57,105**

Donor List

STATEMENT OF GRANT REVENUE For the Year Ending December 31, 2013

Accion contra el Hambre

Asociación Pataz

Australian Centre for International Agricultural Research (ACIAR)

Austrian Development Agency (ADA)

Bill and Melinda Gates Foundation

Bioforsk (Plant Health and Plant Protection)

Branston Ltd.

Cabinda Gulf Oil Company Limited (Chevron)

Canadian International Development Agency (CIDA)

Centro Agronomico Tropical de Investigacion y Enseñanza-CATIE

CGIAR Centers

CGIAR Research Program: Climate Change, Agricultural and Food Security

CGIAR Independent Science and Partnership Council (ISPC)

Commission of the European Communities

Danish International Development Agency (DANIDA)

Directorate of Horticulture, Government of Odisha

Fondo Regional de Tecnología Agropecuaria (FONTAGRO)

Global Crop Diversity Trust

Government of Belgium

Government of China

Government of Finland

Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH on behalf of the Government of the Federal Republic of Germany

Government of India

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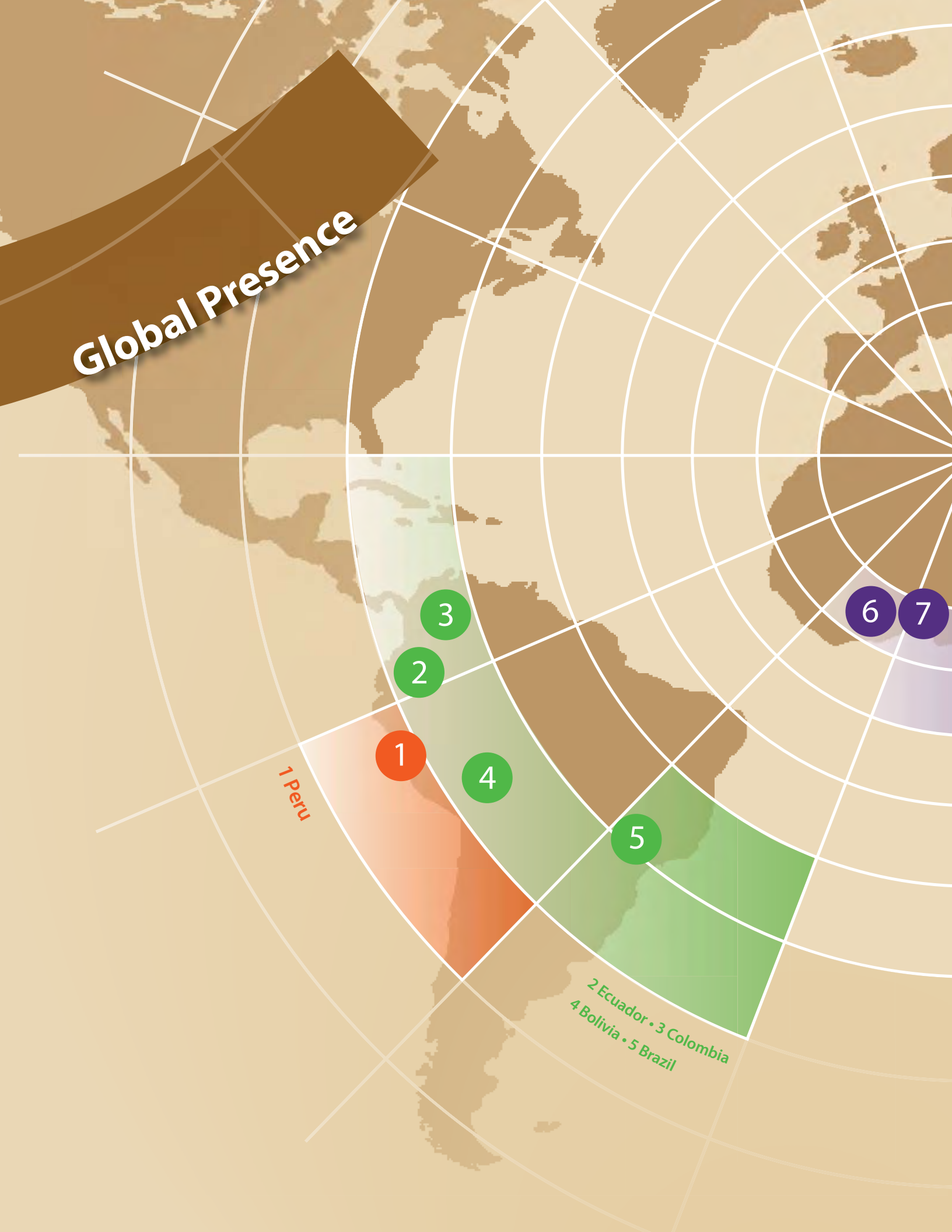

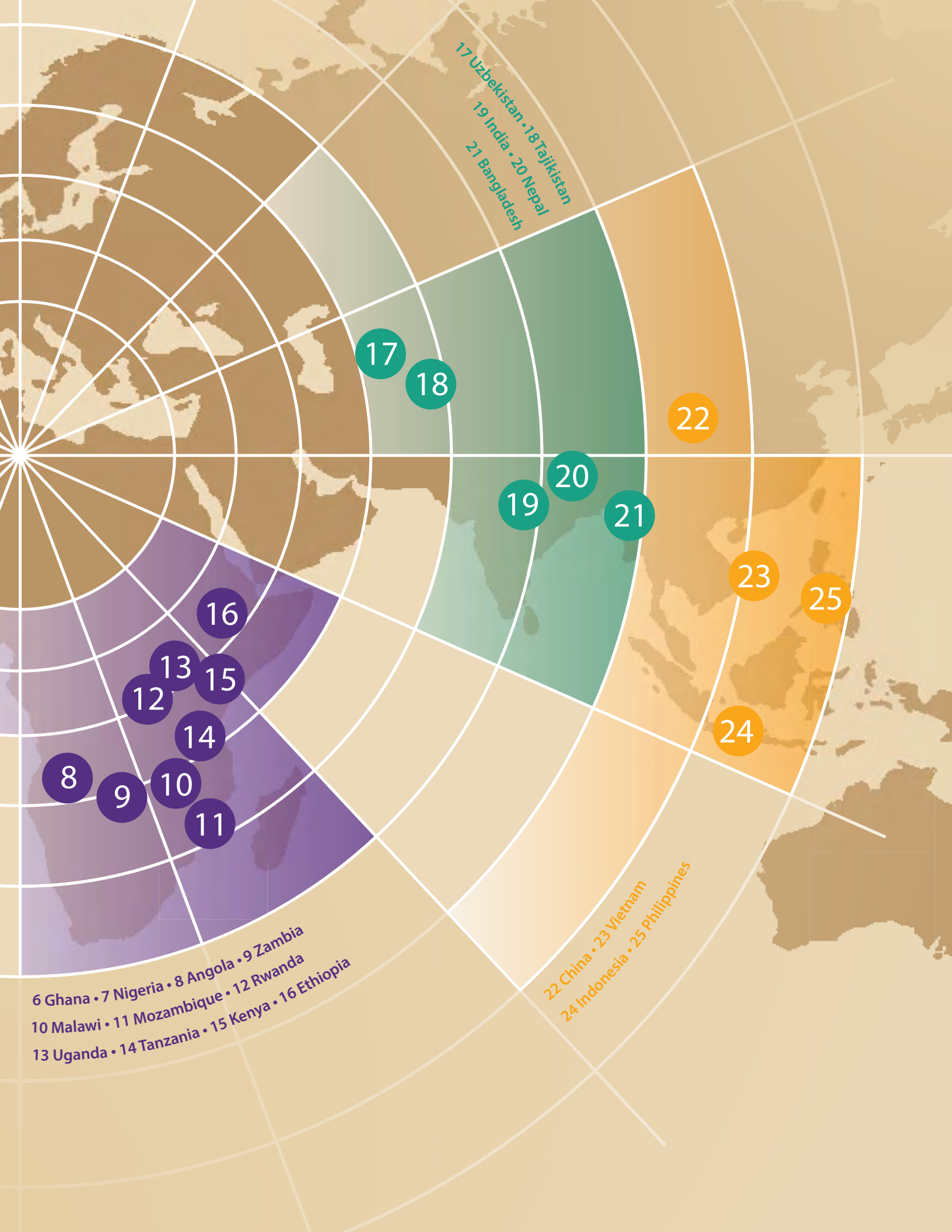
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IFPRI
International Food Policy Research Institute
USA

CIMMYT
Centro Internacional de Mejoramiento de Maíz y Trigo
Mexico

IITA
International Institute of Tropical Agriculture
Nigeria

ILRI
International Livestock Research Institute
Kenya

World Agroforestry Centre
Kenya

Africa Rice
Benin

Bioversity International
Italy

ICARDA
International Center for Agricultural Research in the Dry Areas
Syria

ICRISAT
International Crops Research Institute for the Semi-Arid Tropics
India

IWMI
International Water Management Institute
Sri Lanka

IRRI
International Rice Research Institute
Philippines

CIFOR
Center for International Forestry Research
Indonesia

WorldFish
Malaysia

International Potato Center

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