

**A CGIAR CENTER PERSPECTIVE TO 2020: EMERGING
CHALLENGES AND NEW OPPORTUNITIES FOR ADDRESSING THE CGIAR
GOALS OF ALLEVIATING POVERTY, HUNGER AND MALNUTRITION
THROUGH AGRICULTURE, FORESTRY AND FISHERIES (AFF) RELATED
ACTIVITIES**

**PRESERVING THE CORE: STIMULATING PROGRESS
THOUGHTS FROM THE INTERNATIONAL POTATO CENTER**

P.K. Anderson

Deputy Director General for Research

The International Potato Center (CIP) was formally established in 1971 and accepted into the CGIAR in 1972. Originally, CIP was conceived and operated as a single commodity Center; its operational mandate included potato alone. In 1985, CIP's Board of Trustees added sweetpotato to the Center's research agenda. The mandate was extended further to include lesser-known Andean root and tuber crops (ARTCs). CIP is one of the CGIAR's in-trust germplasm banks. The Center currently holds, in-trust for future generations: cultivated landraces, wild species, and advanced breeding lines of potato and sweetpotato, and 9 species of other wild and cultivated ARTCs. Through CIP's the breeding program, 107 varieties that have used CIP's genetic materials have been released in 26 countries in the developing world. Crop protection research has emphasized IPM for potato late blight, potato bacterial wilt, potato and sweetpotato viruses and root and tuber insect pests. Research on post-harvest utilization aims at adding value to the commodities as pathways out of poverty.

CIP's mission (Box 1) contributes to the overall mission of the CGIAR, in research areas defined by the commodities (potato, sweetpotato, and ARTCs). In 1992 CIP's mission was expanded to explicitly include natural resource management, with initial attention focusing on highland or mountain environments in the Andes. CIP also serves the CGIAR as the convening center for Strategic Initiative on Urban and Peri-Urban Agriculture, the Consortium for Sustainable Development in the Andes, and the Global Mountain Program.

Box 1. CIP Mission Statement

The International Potato Center (CIP) seeks to reduce poverty and achieve food security on a sustained basis in developing countries through scientific research and related activities on potato, sweetpotato, and other root and tuber crops and on the improved management of natural resources in the Andes and other mountain areas.

VISIONING AND STRATEGIC PLANNING

We are in times of dramatic change: e.g. globalization, free-trade and increasing control of agricultural trade by multinationals are redefining needs and opportunities in agriculture; funding from traditional public sector donors is declining; investment by the private sector in agricultural R&D is growing dramatically; there is growing concern over rural-urban linkages; a new biotechnology revolution is underway, with proponents and opponents highly polarized; and, issues of proper governance, transparency and broad participation are becoming fundamental concerns. As research centers of excellence, one of the primary challenges that we face is maintaining a relevant, coherent and high-quality research agenda within the context of an increasingly complex, complicated and dynamic external environment. A well-articulated vision is critical in order to provide guidelines for decision-making and to avoid compromising long-term strategic needs and responsibilities in the face of immediate, external pressures.

With the endorsement of the Board of Trustees, a CIP-Vision and Strategic Planning Exercise was launched in October 2002. Past priority-setting exercises have primarily been internal exercises. In order to open up the process and make it more participatory, we created a CIP-Vision Plenary. The Plenary consists of CIP's the Board of Trustees and the CIP Staff but also stakeholder representatives from our donors, international organization, advanced research organizations, regional research networks and organizations, national research systems, and non-governmental organizations. In October and November 2002, we conducted the 1st Plenary Consultation. The objectives were to explain the process we were using for the Visioning exercise; propose boundaries for the Exercise, and either accept and/or modify the boundaries; and, if those boundaries were accepted, then to generate a map of CIP's general development challenges.

In the year 2000, 192 countries (after several years of meetings and discussions) ratified the Millennium Development Goals and Targets. These are 8 broad Goals and 18 Development Targets that indicate (in quantitative terms) what should be accomplished by 2015 or 2020. We proposed the Millennium Development Targets (MDTs) as the boundaries for the Vision Exercise, based on the logic that CIP is a Research Center within a Research System that is part of the broader International Development Community, which had already accepted these Goals and Targets.

The MDTs were accepted by the CIP-Vision Plenary as the boundaries for the Vision Exercise and within those boundaries the Plenary defined 8 general Development Challenges for CIP (Box 2).

Box 2. THE DEVELOPMENT CHALLENGES TO CIP

CIP can contribute to halving the proportion of population in extreme poverty between 1990 and 2015 – that the population living in **poverty** be less than 15% by 2015 (Target 1).

CIP can contribute to halving, between 1990 and 2015, the proportion of people who suffer from **hunger** (Target 2).

CIP can contribute to reducing by two thirds, between 1990 and 2015, the **under-five mortality rate** (Target 5).

CIP can contribute to reduce by three quarters, between 1990 and 2015, the **maternal mortality ratio** (Target 6).

CIP can contribute to integrating the principles of **sustainable development** into country policies and programs and reverse the loss of environmental resources (Target 9).

CIP can contribute, by 2020, to have achieved a significant improvement in the lives of at least 100 million **slum dwellers** (Target 11).

CIP can contribute to addressing the **Special Needs of the Least Developed Countries** (Target 13).

CIP can contribute, in cooperation with the private sector, to making available the benefits of **new technologies**, especially information and communications (Target 18).

These Challenges are being converted into a CIP Vision Statement, which will form the basis for our Strategic Research Plan and Implementation Plan. The next steps in the Strategic Planning process will be an exercise on Impact Targeting and Assessment, a Needs and Opportunities Evaluation, and a Re-alignment Analysis. These steps are expected to answer the questions, WHERE should we be working, WHAT should we be doing and HOW do we re-align to get there. The CGIAR Priorities and Strategy Exercise being led by the Science Council will provide critical input to our Needs and Opportunities Evaluation and Re-alignment, assuring that our new vision and strategy continue to contribute to and support the overall vision and strategy of the CGIAR System.

For the CGIAR Exercise, we would encourage the Focus Group participants in the course of their deliberations to consider three broad areas of Challenges and Opportunities: 1) Conceptual Challenges and Opportunities, 2) Technological Challenges and Opportunities; and 3) Partnership Challenges and Opportunities.

CONCEPTUAL CHALLENGES AND OPPORTUNITIES

When our System and our Centers were created, our mission and context were relatively simple. We were expected to do research to increase basic food production. Anticipated impact was based on what was also a relatively simple, and linear, logic that: If we increased staple food production, then we would automatically increase the well-being of poor farmers, which has always been the spirit underlying and driving our work. However, over these 3 decades we have come to realize that the relationship is not as simple and linear as we had assumed. There is no doubt that there are less poor and hungry people in the world today, than there would be if the CGIAR had not been working over the past 30 years. But, in order to meet the development challenges that still exist we have to be willing to take on, and crack, the hard poverty and hunger in marginal environments in such a way that the solutions are sustainable and do not erode human and ecosystem health.

One challenge in that process is to improve our capacity to undertake impact targeting, monitoring and assessment. We need to develop and refine methodologies that will allow us to target specific areas and populations that should be prioritized for poverty and hunger alleviation given the vehicles that we have to contribute to impact. Frameworks need to be adopted to study and understand poverty, hunger and environmental degradation. Impact monitoring and assessment needs to go beyond productivity measures to consider a wider set of measures of individual and community well-being, including impacts of individual capacities in decision making, access to decision making processes, empowerment, and enhanced capacity for taking collective action. This multi-dimensional approach to impact assessment will require inputs from disciplines including economics, anthropology, political and health sciences. And, it will require new paradigms.

Another challenge is to develop frameworks that allow us to study and understand complex systems. The challenges of the fragile, marginal populations and environments that we need to target could be characterized as challenges in dynamic complexity. We are attempting to impact upon systems that are biophysically, ecologically, socio-economically and culturally diverse and complex. And, they are constantly changing. In this regard, the definition of modern science cannot be confined to upstream molecular biology and biotechnology. Modern science must include the development of intellectual/conceptual frameworks that will allow us to study and understand complex systems in agriculture, forestry and fisheries.

Most CG scientists have accepted that this more complicated research agenda is necessary if we are going to continue to have impact, especially in the longer term. However, it is worrisome that in this process of accepting our necessarily more complicated mission, as a System, we are jeopardizing our original and fundamental mission. It is common to see resources, both economic and human capital, being diverted into new areas (natural resource management, GIS,

participatory research) that are then compartmentalized or ghettoized – essentially dis-integrated from the core business of the Centers. The challenge is to protect the core that our Centers have built up over the last 30 years of work and build upon that foundation. We do not want to re-define the problem and de-prioritize our traditional areas of endeavor, e.g. breeding, IPM, rather re-define the boundaries around the problem – shifting the boundaries outward to incorporate these new issues and integrate them into the new definition of our core business.

One of the emerging challenges, then, is the need for new conceptual frameworks and paradigms to enable us to study and manage complex systems. At the field level, we need frameworks to move us from compartmentalized disciplinary studies and technologies towards integrated crop/forest/fisheries management. We need frameworks that will help us scale up our research from a focus on the “commodity” to a broader systems analysis of the complex systems in which those “commodities” are imbedded. And, we need frameworks that will help us reach out to integrate across sectors, e.g. integration of agriculture and health. We are beginning to see new models; one example is CIP’s work on TradeOff Analysis to integrate understanding across production economics, environment and human health. But, if these frameworks are to become institutionalized and mainstream, then they need to become the subject of research. The new research agenda should prioritize the development of (or adoption/modification of) complex systems frameworks, with the validation and modification that is necessary for application to resource-poor marginal environments of the tropics.

TECHNOLOGICAL CHALLENGES AND OPPORTUNITIES

Technology is understood here as any combination of techniques, protocols, or procedures used to achieve one’s purpose. Generally, technologies have been developed in agricultural research to generate tangible products and methods such as plant varieties, seed technologies, diagnostic kits, pest and disease management methods, or post-harvest products. Increasingly, information and communication technology (ICT) is being developed and applied to improve generation and communication of information relevant to agricultural production, crop utilization and natural resource management. ICTs can be categorized as transaction technologies because they facilitate coordination, foster information sharing and reduce transaction costs.

Technology has played a primordial role in agricultural development and is expected to continue to deliver solutions to problems associated with crop production and utilization systems as well as natural resource management. There is a growing demand for new technologies that add value to the agricultural products produced by the poor and offer pathways out of poverty.

Access to and delivery of new technologies are also changing due to the growing involvement of the private sector in agriculture. Indeed, the ability to protect one’s ownership of technology outputs (e.g. genes, plant varieties, diagnostic kits,

databases) has promoted private sector investment in agriculture products. Interaction with the private sector is bound to become controversial if there is no clear definition of how to share the benefits derived from new technologies. In this context, we are rethinking the type of technologies, which are currently not used or underused, and that could be acquired in cooperation with the private sector to benefit CIP's target groups. The private sector may also have comparative advantages in delivering new technologies.

Different roles are envisioned for CIP depending on the nature of the new technology and the parties involved in its development, transfer or application. These roles include: a) generating new technologies, b) adapting new technologies, and c) facilitating access to new technologies.

Some of technologies that would be relevant for further development include: high-throughput genotyping of germplasm collection, and variety identification/fingerprinting for tracking germplasm in exchange and breeding programs; genetically engineered potato and sweetpotato resistant to pests, diseases, resistant to abiotic stresses and possessing desired nutritional qualities; genetic engineering for carbohydrate quantity and quality and partitioning modification; frontier science technology for gene discovery for disease resistance and health traits as well as better utilization of gene banks; apomictic botanical seeds; bio-rational pesticides (pheromones, bio-repellants, bio-pesticides, botanical pesticides) for IPM programs; pathogen detection strips and DNA or Peptide chips; and new technology for extensive molecular characterization of pest and pathogen; conservation agriculture technologies; seed systems for developing countries; post-harvest processing technologies for adding value, minimizing loss and stabilizing prices; low-input storage technologies; geospatial tools for ex-ante impact assessment; bioinformatics; decision-making tools for technology deployment; genomics for host-pathogen/pest interaction; tools and methods for understanding problems and implementing solutions in targeted systems, which are complex, dynamic and/or spatially heterogeneous; and decision support tools for policy decisions.

The general challenge is to identify and prioritize the specific technological needs and opportunities for the resource-poor in the target systems and define which of those technology needs and opportunities are most appropriate for CIP to address, as a public goods research institution. The specific challenge is a research and implementation plan for short-, medium- and long term technological development.

PARTNERSHIP CHALLENGES AND OPPORTUNITIES

Strategic planning should also consider challenges related to HOW we organize ourselves to create and capture synergies that increase our development impact? These challenges extend to identifying core values and guiding principles for how we conduct our research. For example, the working group for integration of CGIAR and partner activities in Eastern and Southern Africa has endorsed a set of core values as the basis for collaborative research efforts:

commitment to farmers and other ultimate beneficiaries; multiple pathways to excellence accepted and recognized; commitment to capacity building for all scientists, irrespective of their institutional affiliation; cooperation amongst all partners; and shared credit and recognition. They propose that guiding principles should include building incentives for enhanced cooperation, placing competence before resources, forging strategic alliances in full knowledge of what each partner does well and does not do well, and defining clear roles, responsibilities, timeframes and expectations among partners.

The opportunities associated with re-defining how we do our business include creating and capturing synergies that will lead to more efficient, effective and sustainable impacts. It is interesting that the critiques of our new partnership modalities, e.g. Systemwide/EcoRegional Programs, Challenge Programs, almost always include the comment that the transaction costs are too high. Yet, there has been no analysis of the benefits of these Programs. What are the benefits that arise from working in partnership, and do they justify the “transaction” costs? And, what can we do to increase the benefits relative to the costs? Our research agendas will increasingly involve creating and sustaining partnerships that include donor partners, international/regional/national research organizations, the private sector, NGOs and CSOs. How do we define strategic alliances and construct partnerships that maximize benefits and that can be sustained until the partnership goals have been realized? For these new partnerships to be successful we must set up mechanisms, which do not yet exist, to document and capture lessons learned from the existing partnership projects. Priority should be given to research efforts to develop process and partnership models.

CONCLUSIONS

There is no doubt that the Centers and the CGIAR System have made significant contributions to poverty and hunger alleviation over the 30 years of our existence. The overarching challenge as we move forward is to increase our impact on poverty, hunger and human/ecosystem health in less-favored environments, and to do so with increasing efficiency. We believe that to move in this direction will require: 1) prioritizing the development and validation of new conceptual frameworks and paradigms to improve our impact targeting, monitoring and assessment, and our ability to understand and intervene in complex, dynamic systems; 2) prioritizing the development of technology specifically targeted populations and systems in less-favored environments, and 3) prioritizing the development and validation of process models and methodologies for constructing and maintaining strategic, participatory partnerships to collectively tackle the complex, dynamic problems we are facing in agriculture, forestry and fisheries.