

THE MCKNIGHT FOUNDATION



Collaborative Crop Research Program

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Collaborative Crop Research Program
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Preface

For over 30 years, The McKnight Foundation's Collaborative Crop Research Program (CCRP) has explored solutions for sustainable local food systems through agricultural research. The program grew out of the Foundation's Plant Biology Program, which was founded in 1983, and reflects the Foundation's long-time commitment to place-based grantmaking and learning from those working on the ground. Since its founding, the CCRP has committed over \$100 million through grant and non-grant assistance to further collaborative crop research between smallholder farmers, leading local researchers, and development practitioners. The CCRP's participatory community based approach has been captured in two recent case studies that demonstrate the significant impact this work has had on the field of sustainable food systems.^{1,2}

In 2014, the Foundation engaged The Philanthropic Initiative (TPI) to develop a historic overview of the CCRP to capture its origins and evolution over the last 30 years. To develop this narrative, TPI interviewed past and current Board members, staff, consultants and grantees who had been involved at various stages in the lifespan of the program, and reviewed existing documents, reports and meeting notes.

The report that follows is to serve as part of the "institutional memory" of The McKnight Foundation's Collaborative Crop Research Program. Its heavy reliance on individual recollections may detract from its precision, but such reflections bring to life the program's three decades of commitment, collaboration, and adaptation in an effort to contribute to a world where all have access to nutritious food that is sustainably produced by local people. While not an evaluative document, key moments of influence and impacts are noted along the way.



East & Horn of Africa regional team site visit, 2013

1. Christinck, A; Diarra, M. and Gottfried Hornber. 2014. Innovations In Seed Systems: Lessons from the CCRP-Funded Project “Sustaining Farmer-Managed Seed Initiatives in Mali, Niger, and Burkina Faso”, The McKnight Foundation, Minneapolis.

2. Douglas Horton. 2014. Case Study: Collaborative Crop Research in Action: The McKnight Foundation Support for Andean Grains Research and Development in Bolivia and Ecuador, The McKnight Foundation, Minneapolis. http://www.mcknight.org/system/asset/document/595/CCRP_Horton_Jul2014.pdf

Executive Summary

In the mid-1980's, the Board of The McKnight Foundation became increasingly concerned about the world food crisis. Millions of people in developing countries were starving due to a combination of poor crop production, increasing population, an economic downturn and political conflict. Food production and distribution systems did not reach the growing number of mouths to feed. In response, the Foundation launched a Plant Biology Program to promote interdisciplinary research in plant science that could produce breakthroughs leading to greater crop yields to help to reduce world hunger.

While the first several years of the program achieved its short-term goal of strengthening the field of plant biology, the Board reassessed and refined their strategy to more directly impact food security. Building on The McKnight Foundation's strength of supporting local efforts, the Board shifted the focus to enhancing the human and research capacity of developing world scientists to address food security in their regions. In 1993, they committed \$15 million over five years to the newly created the Collaborative Crop Research Program (CCRP).

After five years of funding, the Board commissioned a mid-term evaluation and learned that, to achieve its goals, the CCRP needed to better connect research to on-the-ground agricultural practices. They focused on integrating farmers and communities into their research and making research more relevant to practice. They also concentrated on under-researched crops and smallholder farmers, both critical components of agricultural production in areas with severe food insecurity. In 2000, the Board announced a 9-year, \$41.5 million commitment to the CCRP, focusing on Sub-Saharan Africa and the Andean Region of South America.

To foster more collaboration and shared problem-solving among the researchers, farmers and NGOs in the region, the CCRP piloted a Community of Practice (CoP) model in the Andes in 2004. After two years, the CCRP launched CoPs in West and Southern Africa, modelled on the Andes, as a mechanism for exchanging knowledge among grantees, leveraging synergies and communicating direct feedback.

In 2008, the Bill & Melinda Gates Foundation awarded The McKnight Foundation a five-year, \$26.7 million grant, which enabled the CCRP to formalize several programmatic changes. The Foundation designed a professional organizational structure with regional consultants serving as the local face of the CCRP, and realigned the governance structure to better leverage expertise through the Advisory Committee. It also partnered with Reading University to provide research methods support to every CCRP grantee, and developed an integrated monitoring, evaluation and planning framework to use feedback, data, and discoveries from grantees to inform the ongoing strategy and action. The McKnight Foundation came to use this adaptive action approach that has been incubated in the CCRP, building it into a Strategic Framework to guide all of the Foundation's work.

Over time, the CCRP strengthened its focus on agroecological intensification (AEI), which aims to improve agricultural performance through integration of ecological principles into farm and system management, as a framework for research and development for smallholder agriculture, and formalized this into an updated Theory of Change in 2011. In 2013, the Foundation received a renewal grant from the Gates Foundation, which combined with McKnight's funding, enabling the CCRP to channel approximately \$11 million per year into agricultural research for smallholder farmers through 2018.

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A Global Food Crisis and Plant Biology

In the early eighties, a rapid growth of assets prompted The McKnight Foundation to explore additional funding priorities that would complement existing grantmaking programs. The Foundation's Executive Director, Russell Ewald, wanted to find a critical issue area where the Foundation could have an impact while also engaging a new generation of family members that were beginning to take leadership positions on the Board. Upon polling Board members, food and agriculture emerged as a potential priority: it complemented some of the existing strategies while also honoring William L. McKnight's roots in farming.

The McKnight Foundation's decision to focus on food and agriculture was timely, as in 1984 famine swept through Ethiopia, raising national awareness to the growing food crisis. Between 1984 and 1985 the famine claimed the lives of an estimated one million people and made millions more destitute. Low rainfall and disease had destroyed crop production, which exacerbated the existing issues including a growing global economic downturn, rapidly increasing population, and political conflict. By late summer and early fall millions of people were starving. As the crisis grew, growing awareness of the famine led to a large scale emergency relief effort. Providing food and medical care saved many lives, but the underlying factors that contributed to the situation remained. Food production and distribution systems did not reach the increasing number of mouths to feed. The problem was not confined to Africa, but was a growing reality for millions of people across almost all developing regions of the world.

James "Mac" Binger recalled thinking at the time: "For me it was a real concern about [the world's] food supply. Where are we headed with five billion people then, seven billion now, and nine billion projected in the years to come? How are we going to feed those hungry mouths under the agricultural system we're operating with? In a nutshell, we needed more efficient and scientific ways of producing food for hungry mouths around the world." Given their interest and a clearly demonstrated need, the Board chose to initiate a new grant program centered on the global food crisis. However, given the scale of the problem, a large question remained: how could and should a small mid-western foundation meaningfully contribute solutions?

“For me it was a real concern about [the world’s] food supply. Where are we headed with five billion people then, seven billion now, and nine billion projected in the years to come?”

The Board worked with Russell Ewald to gather a group of leading policy and agricultural experts to consider a long-term plan of action. Gathering for a weekend symposium at Spring Hill Conference Center in Minneapolis, one factor resonated with the Board – that food was not being produced efficiently. There were myriad reasons for this reality, from geography and crop choice to pests and poor farmer health. In addition, efforts to address the problem scientifically were mainly conducted within issue-based silos. Some cross-talk existed within disciplines but not across disciplines even if the research was related. Symposium attendees felt that encouraging these scientists to work with one another could have a great impact.

These discussions inspired the Board to launch the Plant Biology Program, to support interdisciplinary research in plant science that could produce breakthroughs leading to greater crop yields. The Plant Biology Program was comprised of two components: the McKnight Awards for Interdisciplinary Research in Plant Biology and the McKnight Awards for Individual Research Projects in Plant Biology. The interdisciplinary research projects in plant biology provided annual funding over three years to graduate students and post-doctorates who worked across multiple scientific disciplines, while the individual research projects supported individual young scientists engaged in basic research. The program hoped to stimulate increased interest in interdisciplinary research and attract more young and talented scientists to the field of plant biology. The timing was especially important as the United States (USA) federal funding for plant research had undergone cuts and was at risk for additional cuts in the future.

With no scientific expertise on staff, Russell Ewald tapped many of the field's leading experts, who participated in the initial gathering, to serve on a grantmaking oversight committee. The committee was responsible for spreading the word to colleagues, reviewing proposals, and recommending projects

they felt deserved funding. The first grants were made in 1984 and over the next eight years, McKnight would come to distribute 50 grants totaling about \$18.5 million dollars to plant scientists at universities across the USA. This funding included \$15 million for 15 interdisciplinary projects and \$3.15 million for 30 individual awards.

Expanding Beyond USA-led Research

In the late 1980s, the Board undertook a strategic review of the Foundation's entire body of work. They wanted to be sure that the growing number of programs were focused and strategic. While the Foundation's endowment had grown, the Board recognized that their programs sought to have a large and lasting impact on problems that required vast sums of money to truly solve. It was therefore key to strategically focus the relatively small grantmaking dollars on targeted parts of the larger problems to bring about lasting change.

To better understand how the Plant Biology Program was working, the Foundation contracted Abt Associates (a policy research firm) and Computer Horizons Inc. (a bibliometric analysis firm) to conduct an independent evaluation. The Board wanted to better understand: 1) the validity of their intellectual premise of the long-term link between the global food crisis and interdisciplinary research in plant biology; 2) the efficacy of the program in achieving its objectives; 3) the effects of the program on researchers, universities, and the field of plant biology; 4) the suitability of the program's structure; 5) the notoriety of the program; and 6) if the program required any modifications.

The evaluation's findings, released in 1991, revealed that the Program had been successful in achieving its short-term goals. Grant funding allowed a number of highly qualified scientists to produce leading research that was actively contributing to the field of plant biology. Furthermore the program provided training and education for young scientists allowing them to pursue a career in plant biology, thereby strengthening the field. Most importantly, the interdisciplinary focus was paying great dividends, raising the Program's visibility and receiving acclaim in academia.

The evaluation sparked a discussion among the Board about the future of the Plant Biology Program. The Board wanted to ensure that the Program impacted food insecurity facing many populations. After much deliberation, they agreed to refine

their focus to the more practical and direct links between plant-based research and the nutritional needs of people in developing countries.

Tapping the network of scientists that had helped to inform the Plant Biology Program, Michael (Mike) O'Keefe (then Executive Vice President of the Foundation) was referred to Robert (Bob) Goodman, a professor of plant pathology at the University of Wisconsin. Together with the Board, they agreed that to tackle world hunger through plant biology, they needed a deeper understanding of the connections between the two and the existing infrastructure that supported these connections. The Board commissioned Bob Goodman and his colleague Deirdre Birmingham to write a paper on this subject that could inform key stakeholders and frame a symposium to help the Board restructure the Plant Biology Program.

The second Spring Hill symposium in March of 1992 explored the relationship between plant biology research and the food needs of developing countries. It included the McKnight Board and staff and a team of 22 researchers and applied agricultural scientists with the goal of informing the structure of a research program that could make a significant contribution to solving the global food crisis. Bob Goodman, Vernon Ruttan (Professor of Agriculture and Applied Economics, University of Minnesota), and Clive James (former Deputy Director of the International Maize and Wheat Improvement Center) planned and facilitated the three day retreat.

Part of the symposium was spent looking at the approach of other private funders. At the time, private agricultural research and development funding was led by the Ford and Rockefeller Foundations. They were investing in large international



Millet harvest in Mali, 2014

research centers located in the developing world that met “developed world” scientific standards. Generally, this model focused on lessons learned from the Green Revolution, which emphasized increasing agricultural inputs such as fertilizers, pesticides, irrigation, and high-yield varieties of crops to improve productivity and increase crop yields.

The Green Revolution had led to an average annual increase in crop yields of 2.1 percent per year between 1950 and 1990 and was particularly successful in allowing countries in Asian and Latin American to produce a great deal more food than previously possible and increasing the calories available per person.^{3,4} Bob Goodman noted a fact that stood out to the McKnight Board: “The science currently being funded did not focus on local needs and rarely incorporated local sciences into their work.” Instead, the process was mostly driven by the developed world and focused on crops that were the most heavily researched and could therefore produce the highest yields, like wheat, and maize (corn).

In making improvements to the Plant Biology Program, the Board wanted to be sure to focus on the direct and personal connections that had become a hallmark of McKnight grantmaking. The Foundation prided itself on establishing relationships with communities, empowering them to identify problems, and providing the resources needed to begin solving them. Mike O’Keefe reflected that private funding for agricultural research at the time did not generally hold these principles:

“The scientific leadership, interests, and direction was principally being driven by scientists and centers funded by the developed world. Yet a significant number of talented scientists from developing countries had trained in the North and returned to their home countries in an effort to tackle these same problems. If they chose to work on a localized problem, they were likely housed at a national center or academic institution that lacked the resources for even the most basic of laboratories. We also discovered that these researchers had challenges

staying in touch with any network of peers – they didn’t have resources for travel, and had therefore fallen behind current thinking in their scientific field.”

Mac remembers learning this reality as a turning point of the discussion: “A leading USA university scientist said that if we really wanted to feed third world countries, we had to go there and see what they say the problems are and how they would go about solving them.” There was agreement that this funding approach was rare, but key to addressing the root causes of a global problem. It also closely aligned with the way the McKnight Foundation approached almost all of its other work. “We always try to have this approach,” recalls Pat. “People themselves know what they need best, instead of us coming in and saying – you need this or we’ll give you this. We want them to be in a discussion with us instead of a top down solution. That is the approach we took to everything, so why not to the Plant Biology Program too?”

The Board came out of the symposium with a broad consensus on how they could refine the Plant Biology Program. Mike O’Keefe recalled the excitement that built over the course of the three days: “We started to see a wedge that could be carved out to create an entirely different paradigm in the way agricultural research could be conducted and funded by focusing on problems that are highly specific to the food needs within developing countries, that would draw on talents of scientists in those countries while still leveraging the expertise of developed countries.” The idea was to focus on the professional development of the developing world scientists by funding their projects and connecting their affiliate university or national research institute to a USA-based partner. The goal was to move away from research led by the developed world and instead enable the developing country scientists to take the lead and set the research agenda. The Foundation had a report drawn up describing a potential framework based on this consensus and circulated it to scientists around the world for additional feedback. While they received some pushback from scientists who questioned this shift away from developed countries setting the agenda, the large majority of people confirmed that an approach focused on local scientific leadership was novel and had a chance to make an impact.

The result was a proposal to the Board for a re-envisioned plant biology program that would keep the successful interdisciplinary approach and fund partnerships between

3. Richard Manning, *The Food’s Frontier: The Next Green Revolution*, University of California Press, 2001, p. 4.

4. International Food Policy Research Institute, *Green Revolution: Curse or Blessing?* 2002, p. 3. Available at: <http://www.ifpri.org/sites/default/files/pubs/pubs/ib/ib11.pdf>



Complimentary feeding training for mothers in Tanzania, 2011

developed and developing research institutions, led by those in developing countries with a focus on local food needs. Funding would allow the two to meet, conduct local, on-the-ground research, and supply equipment and staff for developing country laboratories. Understanding that research can't be done in a short amount of time, grants were small in number, but larger in size and spanned multiple years. The program would be overseen by a committee of researchers and applied agricultural scientists from the USA and abroad.

Mac Binger knew that the key to success would be getting the research “down to the ground.” Pat Binger continued: “Our emphasis – Mac and mine – was to have the research focus on practical applications that could feed families and increase their nutritional intake. Maybe some excess would be produced for family income, but at a small scale.” Mac explained further: “Doing research in a lab is one thing, but getting it implemented in the fields was another.” Mac Binger and Pat Binger both understood that the reality of this dichotomy was difficult, took many stages of evolution, and required time and patience.

The Board approved the new program with a total commitment of approximately \$15 million from 1993 to 1998. After a year of planning and forming the Oversight Committee (OC), The McKnight Foundation formally announced the new program in the fall of 1993 through mailings and advertisements in scientific journals. In early 1994, the program was renamed the Collaborative Crop Research Program (CCRP) and the first grants initiated. The overarching goal was “to make a contribution to the security of food production and human nutrition in less developed countries in Asia, Africa, and Latin America through sustained support of research that is closely and strategically linked to issues of food crop production in those countries.” This new program was seen as a strategic shift in the Foundation's approach to food security. Bob Goodman, who was tapped to chair the OC summed it up succinctly: “It was a bold idea.”

National Centers and Their University Partners

The call for proposals received a tremendous response from scientists around the globe, with 450 submissions. Together, the Board and the OC selected 18 research teams to develop full research and training proposals, based on the following

selection criteria: scientific soundness of objectives, potential for impact on food and nutritional needs in developing countries, leadership by developing country scientists, demonstration of an effective partnership between north and south research institutions, and a compelling training plan for developing country scientists to build a scientific infrastructure within the region. Nine of the full proposals were then selected for a three year funding cycle in 1994, and eight of those were renewed for another three years of funding in 1997.

The CCRP's initial selection process raised a number of considerations that would continue to be discussions for the program over the next decade. One of the first discussions was which crops the program should focus on. The larger and more established national centers, like those in India and China, had existing partnerships and focused on mainstream crops like rice. But a number of proposals were also submitted from less established national centers and their rural satellites. These received little attention from anyone and had few established partnerships. Pat Binger recalls one of the first selection meetings focusing on tef. "Tef was a major source of food for one population – a main dietary staple in Ethiopia – but it was not a major crop and wasn't much considered outside of that one country, so do we include it or not?"

The second major consideration focused on the type of science and research outcomes. An early OC member and agroecologist, Alison (Sunny) Power, recalls the OC's early conversations: "We had engaged discussions focused on a basic question – 'What's needed in world agriculture?' We knew the research was meant to be engaged collaboratively and led by developing country partners, but the visions of each member were broad and diverse." As diverse as their opinions were they were ultimately united by the Board's overarching vision to address poverty and hunger. The scientific approach to research did not matter as long as it would pay dividends. This realization would ultimately drive the composition of the OC, with staff inviting members that had different scientific backgrounds and would bring new ideas and ways of thinking to a program that had previously been dominated by plant biologists – breeders and geneticists in particular. Agricultural, ecological, and social scientists would go on to play a key role in shaping the program.

Finally, there were considerations about the proposed collaborations. The OC and Board understood that the project

could not be entirely driven by researchers in developing countries, due to their lack of research infrastructure. Therefore, they focused on projects that demonstrated sincere collaboration, with problem identification and defining characteristics coming from the global south and much of the knowledge base and technology coming from the global north. Mike O'Keefe explained that while collaboration was central, the proposals that really embraced it often required a tradeoff in the depth and quality of field-contributing research.

Ultimately, the nine-grant cohort would come to reflect a balanced risk portfolio that tended to "emphasize biotechnology and other up-stream approaches" where research advances could provide "spillover" that had practical application across crops by mixing both high- and low-tech approaches. This included crops like tef and sorghum as well as rice and wheat, disciplines spanning basic research focused on molecular biology to applied research such as farmer-participatory breeding, and a diversity of regions spanning Africa, Asia, and Latin America. The idea was to focus on agricultural development and crops while integrating the needs of smallholder farmers and stakeholders.

Measuring Impact of Research Partnerships

In 1998, The McKnight Foundation commissioned a midterm evaluation of the CCRP. Eight of the nine original grantees had been renewed for an additional three years of support, but the Board wanted to consider what impact they were having. The evaluation was to be conducted by a select team of outside reviewers, including Rebecca Nelson, who would later be hired as the Program Director and currently serves as the Scientific Director for the CCRP. Through this evaluation, the Board hoped to explore how well positioned the CCRP was to contribute to food security within the countries they were working. Pat Binger recalls: "I think there were some good partnerships developing – in that the USA scientists could work with developing country scientists probably providing more depth and rigor than was generally available to them; but, we still saw the USA scientists coming on too strong in terms of agenda setting. We wanted more collaboration and less of a teacher/student dynamic."

Pointing to a number of specific grant successes and concerns, the evaluation revisited many of the considerations that had been raised at the Spring Hill symposium. It provided an opportunity for the Board and the OC to see how the diverse

portfolio they had constructed held up to the principles they were striving for. The evaluators thoroughly examined all aspects of the CCRP through interviews with major stakeholders, visits to all CCRP project sites, and a review of proposals and other documents provided by the Foundation. The picture that emerged at the end of evaluation in July of 1999 was a broad program of high scientific quality that funded important contributions to basic research. However, while the collaborative partnerships provided important linkages, some ran more smoothly than others and the broad geographic range made it difficult to administer the grants without a greater level of oversight.

The Board wanted to ensure that they were having a measurable impact toward the goals outlined in 1993. While the Board understood that research alone could not solve the food crisis, the report demonstrated that the research was still too focused on knowledge generation and not on practical solutions that could be applied to the problem. In some ways the focus on research of the “highest quality” was taking away from the relevance of the end product, and while it is not impossible to have both, there are tradeoffs. As noted in the 1999 evaluation:

“A general look at the USA plant research establishment might suggest a negative correlation between scientific prestige and agricultural importance. The best and brightest are not, in general, tackling the issues that are most pertinent to food security; they are more preoccupied with the new, the fundamental, the publishable, and/or arcane. A researcher of only average creativity and advancement can have an extraordinary impact, particularly if he or she is passionately devoted to the cause.”

Taking in the report, the OC and the Board were proud of their scientific accomplishments in plant biology and agriculture, and yet realized they needed to think more about systems and context. The Board knew that it would take a substantial commitment to become more focused and deliberate, but the CCRP’s early scientific successes emboldened them around what could eventually be accomplished. The Board spent the following months working with the OC and evaluation consultants to better understand how their learnings since

1982 could be used to further connect the research to people who suffered from food insecurity going forward.

Integrating Farmers and Local Agricultural Research

Following a decade of slow growth in the 1980s and 1990s, global public spending on agriculture was finally on the rise. Despite this small success, the majority of the money continued to fund middle-income or high-income countries, and rarely focused on low-income countries and their needs. In 2000, the Board announced a nine-year \$41.5 million commitment to the CCRP. This commitment signaled the McKnight Foundation’s long-term commitment to agricultural research with a focus on developing countries. At that time, there were very few funders supporting this incredibly important area. Pat Binger explained: “We felt that it would require setting up deeper partnerships, helping to define relationships around who does what science, and conducting field trials. To do this, the Foundation would have to make a lengthy commitment.” Mac Binger remembered some of the thinking behind this rather unprecedented commitment: “[It was] a large figure for a long period, but the length showed that we were serious about the issue, we were committed, and we wanted to see successes. We intended to follow through on it.”

Sunny Power recalled how refreshing the shift was as a member of the OC: “It gave us the freedom to think about where the CCRP could be ten years from now. Most of us got funding for our own research with a max of three to five years. Having a program provide the opportunity to look ten years down the road allowed us to ask: What are the successes we’d like to see out of this program?” Along with the funding commitment, a determination was made to engage a consulting program director for the CCRP. Rebecca Nelson, one of the three authors of the 1999 program evaluation, was selected for the role. Rebecca would serve as a direct bridge between the Foundation staff and Board and the OC by collaborating closely with the OC on grantmaking and submitting quarterly reports to the Board to keep them apprised of progress.

To have the greatest impact, the CCRP would need to be much closer to on-the-ground agricultural practices. This meant a tighter focus on areas of the world where the needs were the greatest. Those suffering from the highest levels of food insecurity were often the poorest of the poor, living in some

5. Review of the McKnight Foundation Collaborative Crop Research Program, July 20, 1999.

Dr. Robert Mwanga



Dr. Mwanga in the field.

Photo credit Rebecca Nelson

CCRP first began providing funding for Dr. Robert Mwanga in the 1990s while he was working to complete his PhD in sweetpotato breeding at North Carolina State University. After completing his studies, Mwanga returned to Uganda and rebuilt the country's national breeding program. Since 1995 Dr. Mwanga and his team of researchers have released over 20 varieties of sweetpotatoes. This success spurred the Gates Foundation to provide funding for the Sweetpotato Action for Security and Health in Africa (SASHA) program in 17 different countries. USAID has also provided funding through the HarvestPlus Program.

Mwanga's research and programs have helped to highlight the importance of the orange-fleshed sweetpotato. In the last decade the crop has been the focus of an intense, coordinated, global effort to realize its full potential as a source of food, feed, processed products, and income for millions of small scale farmers and low-income consumers in Africa, Asia, and Latin America.¹ More than 95 percent of the global production is in developing countries, where it is mostly grown as a starch staple.² Africa produces 7.5 million metric tons of sweetpotatoes, accounting for 6% of the world production, 75% of which is in East Africa, mainly around Lake Victoria.³

1. Yanggen, D., Nagujja, S. 2006. The Use of Orange-fleshed Sweetpotato [sic] to Combat Vitamin A Deficiency in Uganda: A Study of Varietal Preference, Extension Strategies and Post-harvest Utilization. International Potato Center

2. FAO. 2008. FAO Statistical Yearbook. FAO, Rome.

3. Ibid.

of the harshest conditions for agricultural production. The context specific conditions that existed in these places meant that few, if any funders were working in these environments. Furthermore, the Foundation had learned, from continuing investments in the research of tef in Ethiopia and Andean root tubers in Peru, that culturally-important yet regionally-specific crops were often ignored by governments and researchers despite being dietary staples of the most food insecure. Dr. Robert Mwanga, a longtime CCRP grantee and scientist who led the national sweetpotato breeding program in Uganda and currently works for the International Potato Center in Africa, described the ripple effect inspired by McKnight's focus on these under-researched crops: "Their vision has helped to bring on board other donors to realize that these commodities are very important and support a large part of the population. That support could help alleviate some of the malnutrition."

Bob Goodman described the exciting shifts that CCRP began to slowly undertake: "The CCRP withdrew from advancing agricultural situations in Asia and focused on Sub-Saharan Africa and the Andean Region of South America. The idea was also to engage community and farmer groups and link them more tightly into influencing agricultural research practices. We wanted to bring social, technical, scientific, and cultural considerations together to actually change the situation on the ground. What I'm describing is not a revolution, but an evolution of the thinking behind the CCRP. It was entirely guided by the Board and their sense that the CCRP had been doing important stuff, but that stuff was not close enough to what happens on ground."

Making these shifts required patience and flexibility. Rebecca Nelson recalled feeling compelled by the job that lay ahead

“Most of us got funding for our own research with a max of three to five years. Having a program provide the opportunity to look ten years down the road allowed us to ask: What are the successes we'd like to see out of this program?”

for the CCRP. “Our agenda was to support smallholder agriculture, with a focus on people who were getting the short end of the stick. The research must benefit the people we say it is going to benefit. It must be able to drive toward the outcomes that represent McKnight’s key values of equity and self-determination. Ultimately, it is about the relevance of the research.” Achieving this agenda would require a deeper level of collaboration. Farmer groups would need to become a much more integrated part of the program, a concerted effort would need to be placed on trans-disciplinary discussions, and the flows between researchers and development practitioners would need to be improved. The Foundation had learned that these types of relationships were not common, and in order to achieve the impact they wanted to see, they would need to be driven, at least initially, by the CCRP and its grant requirements.

An example of one such CCRP-funded collaborative is the “Sustaining Farmer-Managed Seed Initiatives in Mali, Niger, and Burkina Faso” project. This seed systems grant began in 2006 and focused on engaging farmer cooperatives as key partners in the research and development of innovative seed systems. A key goal of the project was to not only make quality seed available to farmers, but also to empower local farmers to take ownership of the seed production chain. This process assured farmers’ access to a diverse array of good quality seeds of preferred varieties. Over the years, this meant that the adoption and utilization of new varieties of seeds was 25-50% higher in the villages where farmers led seed production than in other areas. Additionally, the farmers that used improved varieties and agricultural practices improved their yields by up to 50%.⁶

Communities of Practice and Increasing Localized Collaboration

In the early 2000s the OC began working toward the Board’s mandate: moving research and practice closer together. The first step was taking a more focused approach that would leverage a relatively small amount of grantmaking dollars into research outcomes. Under-researched crops, being grown and consumed by the poorest of the poor, in some of the world’s harshest environments, was a space where there were virtually no other private funders. Smallholder farmers battled food insecurity on a daily basis and small, highly specialized research gains had the potential to make an immediate impact.

Under-researched Crops



Peruvian farmers voting for “best potato”, 2009

Roughly 30 crops, of the world’s approximately 7,000 varieties, provide 95% of the world’s food energy.¹ Under-researched (also known as orphan, forgotten or minor crops) refer to a group of crops that are not widely produced, typically not traded internationally, and receive little attention from research organizations. Under-researched crops include tubers like cassava and sweetpotatoes, cereals like quinoa, millet, sorghum, and tef and other vegetables and fruits. Despite their lack of international presence, they are generally more nutritious and genetically diverse than staples like wheat, corn, and rice, and therefore can help reduce global nutritional deficiencies and increase caloric intake. Under-researched crops typically can grow in harsher climates and can be more resilient to climate change as they generally require less water and can tolerate higher temperature and droughts.² These crops are an integral part of many cultures and are important to preserving tradition. Many of the world’s under-researched crops are dietary staples in developing countries, yet they remain under supported and under researched.

1. Williams, J.T. and Haq, N. 2002. Global Research on Underutilized Crops: An assessment of current activities and proposals for enhanced cooperation. ICUCInternational Center for Underutilized Crops, Southampton, UK.

2. Pearce, Fred. Interview of Monkombu Swaminathan, “A Call to Remember Forgotten Crops,” December 20, 2013, Thomsonreuters.com. Available at: <http://sustainability.thomsonreuters.com/2013/12/20/executive-perspective-call-remember-forgotten-crops/>

Communities of Practice

Communities of Practice (CoP) are a group of people who share a collective passion or concern and engage in a continuous process of learning to improve their skills through their interactions. While the idea and phenomenon of CoPs is quite ancient, the term itself was first coined in 1991 by cognitive anthropologists Jean Lave and Etienne Wenger in their book *Situated Learning*. This idea became the basis for the social theory of learning. Three unique and important characteristics are required for a community or group to be considered a CoP. First the group must have a shared domain or core competency that distinguishes them from others. Second the group must continuously engage in joint activities and discussions to facilitate learning. Third the group must be a set of practitioners not merely people with a common set of interests. Through their interactions they develop a shared repertoire of resources and disseminate vital information both consciously and unconsciously.¹

1. Lave, J. and Wenger, E. 1991. *Situated learning: Legitimate peripheral participation*. Cambridge University Press, Cambridge, UK./



Recipe exchange for legumes in Kanungu, Malawi, 2009

In response, the CCRP shifted from awarding a limited number of large grants, to increasing the number of smaller grants being awarded to cross-sectoral teams working within the defined regions. These changes brought the CCRP program closer to achieving the Board's mandate, while also demonstrating that a closer relationship between researchers, nongovernmental development organizations (NGOs), and farmers through cross-sectoral teams would be required to improve the link between science and application.

The CCRP had learned through this experience that if you could build relationships and trust, a collaborative, problem-solving culture could be developed. With research as the key value added by the CCRP, the OC – which had grown to include a diverse mix of social and biological scientists from around the world, including past grantees – and McKnight staff began to explore the idea of a Community of Practice (CoP) in which researchers and farmers could come together around a common problem. Ultimately, the Board would agree to roll out a pilot program for a CoP in the Andean Region of Latin America

Julio Kalazich, a former grantee and current Advisory Committee chair, explained how the OC and Board hoped it would work within the more focused framework of the CCRP: “If you're working in the Andes, in multiple countries that have rural areas with harsh environmental conditions and high poverty, and on a crop like quinoa that is common to the area but ignored from a research perspective, there will be some similarities in the agroecology – high altitude, poor soil quality, low temperatures, and crop fertility issues. By funding multiple projects in the region and bringing the researchers and stakeholders together in a community you have a better way to adapt technologies, learn lessons, and change people's knowledge base. You would be able to better identify research gaps that would more broadly benefit the farmers living there.”

Developing a CoP and building the necessary trust and relationships could not be done overnight. It required detailed planning and cajoling to start. A pilot CoP would officially launch in the Andes in 2004, and a regional grantmaking focus was placed on Southern and West Africa. The pilot program was a bold move as it both empowered grantees at the local level and

6. Christinch, A., Diarra, M. and Horneber, G. 2014. *Innovations in Seed Systems: Lessons from the CCRP-funded project “Sustaining Farmer-Managed Seed Initiatives in Mali, Niger, and Burkina Faso”*. The McKnight Foundation. Available at: https://www.mcknight.org/system/asset/document/743/original/CCRP_SeedSystems_Nov2014.pdf

decreased the influence of the northern partner institution. The OC and the Board were concerned that this shift could decrease the quality of the research produced. The CCRP took two approaches to address these concerns. First, the formal linkages between northern and southern research institutions were retained in some cases where the southern regions had limited support and infrastructure. Second, the Foundation focused on communication and collaboration between programs at semi-regular regional and program-wide gatherings to build up capacity and transfer knowledge.

From the start, CCRP focused much of its efforts on under-researched crops of local importance in developing countries. Overtime, the program increasingly focused on linking research on crop production with nutritional outcomes based on the consumption of these diverse, nutritious and locally adapted crops. The program asked itself: what would we do differently if our goal was the well-nourished child rather than a bigger pile of grain? When the program began using a CoP approach, the CoPs were oriented toward outcomes that included increased production, nutrition, livelihoods, and sustainability. In 2004, the first annual Andes CoP gathering the participants looked closely at the theme of nutrition. Rebecca Nelson explained some of the thinking behind this:

“It was considered a radical move to focus the first CoP meeting around nutrition because, while it has subsequently become fashionable, it was then unusual for nutritional outcomes to be explicit goals for an agriculture program. It wasn’t that the gathering was only about nutrition, but it was taken as the meeting’s key theme to send the message that our work on agriculture is aimed at helping that malnourished child to develop to her full potential. Crop research for nutritional outcomes forced the program to more explicitly target those who are struggling with food insecurity. It encouraged work on the production and consumption of diverse crops. A focus on higher crop yields of potatoes might or might not benefit that undernourished child. Nutrition was a helpful lens for moving the research towards system diversification and outcomes that benefit smallholders.”

Held in Bolivia, the Andes CoP meeting included scientists, NGOs and leaders from local farming communities deliberately

coming together to find a way to work together on a shared goal. Carol Berde, Executive Vice President of the McKnight Foundation at the time recalled the experience: “I began to see how important it was to make the connection between farmers and scientists while at the same time realizing that it would be very, very difficult. Not just in terms of working collaboratively, but things as simple as language barriers since most researchers spoke Spanish and the local farmers spoke Quechua.” Despite these challenges it was evident that the CoP could have a huge effect on the program by maximizing impact.

In 2006, CoPs were launched in West and Southern Africa modeled on the Andes. They would serve as a mechanism to share principles with and between grantees, while also providing direct feedback on what was working and what was not. While grants had been made in loosely defined regional clusters in sub-Saharan Africa until that time, the CCRP was ready to build on the collaborative experiences along the same model. Bettina Haussmann, a grantee based in Niger at the time, recalled thinking about how a CoP would change her work: “We realized that the individual projects were not so big, but once you see the other projects in the CoP, you could see the complements and potential overlaps to be leveraged to bring up a bigger picture that was community-based and could also be along the entire value chain of a crop like sorghum or millet.” In addition to the bigger picture, the grantee forums provided a chance to exchange knowledge, watch others’ progress, and exploit synergies. The incredible value of these gatherings stood out to many grantees who otherwise struggled to initiate similar interactions on their own. In 2013, McKnight commissioned a study on the influence and added value of the CoP model in the Andes, then entering its 10th year. In this study, grantees reported that the CoP helped improve their professional and leadership skills, while also exposing them to new perspectives on how holistic research and collaboration can improve development strategies.⁷

Evolutions in Program Leadership and Partnership

As the CCRP shifted to a more localized approach, the Board commissioned the TCC group (formerly The Conservation Company) to evaluate the CCRP’s central governance structure. The Board hoped to understand how to improve the current organizational structure to support a growing international program. The evaluation team reviewed documents, conducted

stakeholder interviews, and profiled three similar foundations to inform their recommendations. The final report in October of 2005 celebrated the visionary nature of the program, while offering small operational recommendations to improve efficiency and increase accountability. Recommendations included clarifying roles and responsibilities, instituting a formal monitoring and evaluation program, developing regional capacity, and increasing communication channels. While many of these suggestions were not immediately implemented, they helped to inform and guide the discussions and transitions that came in subsequent years. Most importantly, the report highlighted a larger consistent theme throughout the life of the CCRP program—its ability to adapt and evolve in response to constantly changing internal and external complexities.

The adaptive learning that had come to define the CCRP was driven by The McKnight Foundation's approach to grantmaking and in 2006 the Foundation was in the process of undergoing its own transformation. Kate Wolford reflected on what she saw upon her arrival after she was hired as President of The McKnight Foundation: "Individual projects and researchers tied their success to the nature and longevity of McKnight's funding. The Communities of Practice were building bridges and learning across disciplines. And, more focus was needed on authentic farmer involvement so that research would be relevant, as well as scientifically sound. The Foundation needed in-house leadership with international research and evaluation experience."

Soon after, Jane Maland Cady was hired to be McKnight's International program director, marking the first time that direction and leadership of the Foundation's three international programs (CCRP, East Africa Women's



Cattle and grain storage units in Bokki, Niger, 2004

Economic Empowerment, and Southeast Asia) would be a combined portfolio and overseen by a common director. All three programs could be traced to a desire to improve and sustain livelihoods of the most vulnerable people with a focus on building local capacity. Each program also referenced subsistence agriculture, even if minimally. However, the strategic approaches, management styles, and emerging issues varied greatly. The most common thread was taking a humanistic approach; looking at the issues through the lens of the people they are affecting and not just as economically-based problems that have a formulaic answer.

Concurrently, in 2006 the Bill & Melinda Gates Foundation launched an Agricultural Development Initiative with a commitment of \$100 million and reached out to the Foundation to explore a potential partnership. At the time food prices were rapidly rising at rates not seen in decades. Between 2005 and the summer of 2008 the price of wheat and corn tripled and the price of rice increased fivefold.⁸ These prices hit the poorest billion the hardest since they typically spend the majority of their income on food. This was exacerbated by the decline in agricultural aid which fell from 17 percent of all aid in rich countries in 1987 to just 4 percent in 2006.⁹ The World Bank estimated that the food crisis pushed 130 to 155 million people into poverty in 2008, which spurred food riots across the world as demand began outstripping food supply.¹⁰

The Gates Foundation had been apprised of and interested in the work of the CCRP for a number of years and had been invited to attend a number of the CCRP gatherings. The McKnight Foundation's strong reputation, and solid organizational processes and structures also attracted the Gates Foundation. Kate Wolford reflected on her sense of their interest: "They had seen McKnight's willingness to commit to the agricultural development field for a long time without diminishing funding. Their program wanted to support research into hunger hot spots around the world, and they saw a partnership with the CCRP as a way to learn and inform their emerging strategies."

7. Ambrose, K.2014. Influence & Added Value of the Collaborative Crop Research Program in the Andes. The McKnight Foundation. Available at: https://www.mcknight.org/system/asset/document/594/CCRP_KaiaAmbrose_Jul2014.pdf

Those initial conversations quickly morphed into a discussion about whether McKnight would consider applying for funding from the new Gates Foundation program. The McKnight Foundation had never been in the role of being a grantee. While initially the Board felt that it would be a great opportunity, Pat Binger recalled that that the funding had the potential to also come with “a lot of baggage.” This was a decision that could not be made quickly; it required “several iterations” of thinking. Bob Struyk, a member of the McKnight Board, remembers some of those deep conversations: “We had a lot of discussions about whether this would change the focus of program. Could we retain the CCRP’s nature and quality? And there was a concern haunting us all along – sure, it’s nice to have a bump in funding, but you also must plan for what to do when the funding ceases.”

Prem Warrior, a Program Officer for the Gates Foundation, recalls where the synergies existed:

“We shared a common mission: to help the small holder farmer. While participatory research was at the core of the [CCRP] – having farmers participate in evaluating and developing technologies and having them spread the message – however, what it did not do was widely disseminate and scale them. CCRP communities were small and the message was delivered to thousands...at Gates Foundation, our target was to reach millions. At the same time they were using multiple technologies on multiple crops in multiple geographies. This presented a very good experimental approach from which Gates Foundation could learn and then develop programs that have the potential to be scaled up.”

In essence, The McKnight Foundation wanted to assure the integrity and standards of the CCRP as they had developed and designed them over two decades, and not be required to change their approach based on the Gates Foundation’s

8. The Global Social Crisis: Report on the World Social Situation 2011, United Nations, New York, <http://www.un.org/esa/socdev/rwss/docs/2011/chapter4.pdf> p. 62.

9. Gates Foundation: Annual letter 2012. Available at: <http://www.gatesfoundation.org/who-we-are/resources-and-media/annual-letters-list/annual-letter-2012>.

10. The Global Social Crisis: Report on the World Social Situation 2011, United Nations, New York, p. 63. Available at: <http://www.un.org/esa/socdev/rwss/docs/2011/chapter4.pdf>.

vision or opinions. The Gates Foundation wanted to ensure their funding would not cause the McKnight Board to reduce the resources they were committing to the CCRP, but instead strengthen them. With their nine-year commitment coming to a close, The McKnight Foundation Board had been closely monitoring the program’s transformation and results. Regardless of the Gates Foundation decision, in February of 2008 the Board decided to commit to funding the CCRP at \$47 million for an additional ten years. Shortly thereafter, following two years of discussion, The McKnight Foundation submitted a grant proposal to enhance existing CCRP efforts while also formalizing a fourth CoP in East and Horn of Africa, and was awarded a five-year \$26.7 million grant in October.

The grant from the Gates Foundation provided the CCRP with the ability to formalize many of the transitions the Board and leadership team envisioned and had been discussing for the past few years. They understood that to adequately support the local CoPs and advise the grantees it would require a large-scale programmatic transformation. The Gates grant enabled them to set in motion many of these changes to increase their impact on global food security as well as significantly ramp up grantmaking. From 2008 to 2009 total grants made increased from 27 projects at \$3.1 million to 44 projects at over \$5.2 million.

Reinforcing Regional Research Support and Capacity

As grantmaking shifted to CoP-based clusters, the CCRP now had the appropriate structure to address the areas of identified need at the regional level in a coordinated manner. The McKnight Board and CCRP stakeholders had learned through their experiences working in agricultural research that to create a sustainable system they could not import scientists or simply rely on a limited number of them. They reaffirmed that they would need to build the human capacity for agricultural research and development in each of the countries and regions where they were active. Many of the programs had graduate student researchers, and in a few cases the graduate students were principal investigators. Not only did the entire program need a place to turn for strategic advice on rigorous research trends, but many grantees needed assistance with the hard skills that their projects demanded.

In order to contribute to sustainable change, the Foundation

understood that they would need to contribute to strengthening the capacity of current researchers working in the national centers as well as support new scientists and development professionals. The Foundation dedicated even more funds to include educational support within existing grants to allow students, primarily from developing countries, to receive graduate and undergraduate degrees from local and regionally-based universities as well as USA and European universities.

The McKnight Foundation reached out to the Statistical Services Centre based at Reading University in the United Kingdom to explore potential collaboration and in 2008 made a grant to a small pilot program that included statistical training for the West Africa CoP.

Due to the success of the pilot program, in 2009 The McKnight Foundation made a larger grant to expand the partnership across the CCRP program. The University would provide research methods support and workshops to every grantee within the CCRP. Any researcher in the program could call Reading for feedback, guidance, or direct assistance at any point in their work. The University's experts were essentially on-call for any questions that arose around agricultural research methods, from general field-wide approaches to specific statistical analyses. Richard Jones explained how this partnership was made possible by the additional funds from the Gates grant. "The [Gates] grant allowed McKnight to fully implement the cross-cutting grants to Reading as envisioned, and afforded the investment in expanding regional teams. It acted as cement that could put all the bricks that McKnight had invested in building, together."

Project Impact on Students

Between 2008-2013 CCRP funding supported 242 students involved in project grants

The majority of funding supported study and research contributed to MSc degrees, followed by undergraduate and PhD degrees.

40% of PhD students were women

67% of all students studied at institutions in the global South

Revamping Governance Structure

The increase in grantmaking and the placed-based support strengthened the CCRP, while also adding to its complexity. It was necessary to outline how to design a professional supporting structure that could accommodate these changes. Since Jane Maland Cady's on-boarding, Rebecca Nelson's role had already shifted from Program Director to Scientific Director. It was now appropriate to rethink the role that the OC would play moving forward. For over a decade they provided thought leadership, grant recommendations, and program review to The McKnight Foundation Board and staff. They also served as de-facto grantmakers, conducting regular site visits and helping to navigate relationships and inform research decisions, and acting as an intermediary for the Foundation. With an increase in the number of grants and to ensure that the grantmaking focused on locally identified needs and research, it was evident that the professional support structure needed to be more closely aligned with each CoP. To meet these new needs, two important shifts would need to occur. The first change was to add a professional team to support the grantees. Previously, the OC had often acted in this capacity, but with the increase in grantmaking this was no longer within the members' capacity. Therefore now the grant selection, management, and oversight responsibilities would be the responsibility of the Foundation staff, the Scientific Director, and most importantly, increased support from a team of regional consultants with an understanding of the grant portfolio from a local perspective.

The second shift was to transform the Oversight Committee to the Advisory Committee (AC). By transferring the grantmaking and oversight work to a regional consultant team, the committee could focus on high level advising and framing where it was needed most. The new AC would operate much more as critical friends to program and regions, challenging assumptions, playing a strong role in the twice-annual CCRP Leadership Meetings, and be a sounding board for both grantees and staff. There would also be concerted effort for the make-up of the committee to reflect a deep knowledge of the new regional focus.

Kate Wolford noted, the time was right for a shift in the focus and composition of the Advisory Committee. "The AC now plays an important strategic role in situating the work of CCRP within a broad ecosystem of actors engaged in agricultural

research, honing our niche and approach, and identifying policies and relationships that extend the reach and impact of this program.”

With the strengthening of CCRP leadership within the Foundation, and a shift to the new AC, the program structure needed to better support the new grantmaking process and grantee organizations. Regional consultant positions were further refined, and dedicated scientific and regional team members were engaged in each CoP. The liaison scientist and the regional representative would focus on evaluating, informing, and supporting the research projects – both proposed and ongoing, while also being responsible for helping to build the local connections within and between projects both between and among scientists, NGOs, and farmers themselves. While McKnight’s international program staff attended regional meetings and occasionally made site visits, these dedicated regional team members would be the local face of the CCRP, coordinating regional gatherings, providing key input and feedback to CCRP leadership, and demonstrating a participatory system for grantmaking.

This transformation of the CCRP did not occur overnight, and represented a big move not only for McKnight but for some of the grantees whose research had been supported for over a decade. Claire Nicklin was contracted as the regional representative to the Andes CoP shortly after it was formed. Being the point of contact for many grantees she remembered the experience: “Some may have thought we shifted too far toward incorporating social sciences or farmers, but in general it was exciting to them too.” But with this new approach, Claire Nicklin also felt the stakes were higher. The new process had to maintain rigor while being more participatory.

Systems Thinking: Adaptive Action, Theory of Change and AEI

Though the CCRP required annual grantee reporting and the former-OC and staff would routinely check in on progress, a program-wide system for monitoring and evaluation (M&E) had never been implemented. Jane championed and led the build-out of a robust M&E program to track progress and inform future performance. The Foundation and the CCRP leadership team knew the value that M&E could bring to implementation and design of both specific projects and also the entire program.

Prior to coming to McKnight, Jane Maland Cady worked as an evaluator. She had focused on evaluation with a systems perspective and saw that, in the complex environment of CCRP, an operating framework that was both systems based and systems informed was essential for program planning, evaluation and management. With the help of three leading evaluators, McKnight developed an integrated monitoring, evaluation, and planning (IMEP) framework to be used both as an adaptive action framework at regional and program levels as well as at the project level as another form of non-grant support. This team of evaluators included Glenda Eoyang, the founding director of the Human Systems Dynamics Institute, who would later become instrumental in helping to apply this adaptive action across the entire Foundation. The framework built in six month interval loops of adaptive action at the project, region, and program level. Through this approach CCRP would be able to use feedback, data, and discoveries from grantees to inform their ongoing strategy.

The implementation was a complex process as most of the grantees were not familiar with the concept and the leadership team was perfecting the development of an iterative and adaptive system. As Jane Maland Cady articulated “it’s a system that’s maturing,” and the result, “was not just a monitoring and evaluation process, but an operating system for the entire program.”

While the funding from the Gates Foundation allowed the CCRP leadership to focus the work more closely on the communities themselves and incorporate and develop IMEP, it also sparked a conversation around the macro-themes of the



Researcher at Sokoine University of Agriculture, Tanzania, Botanical pesticides project, 2011

Agroecological Intensification

The goal of AEI is to improve the performance of agriculture through integration of ecological principles into farm and system management. Depending on the context, improved performance may mean any or all of the following: increased productivity, enhanced use of local resources, maximized returns from external inputs, improved stability and/or diversity of diets, with associated increases in resilience and environmental service provision from farmed landscapes. AEI is characterized by: 1) leveraging local and global knowledge to improve efficiency and effectiveness of crop, tree, livestock, pest and disease, and soil management; 2) enhancing soil health and fertility, increasing functional diversity, and reducing pre- and post-harvest losses; 3) contributing to the development of local value chains and diverse and nutritious human diets; 4) its flexibility and responsiveness to local conditions, including farmer' access to inputs and markets; 5) its evolving understanding of biophysical, socio-economic, cultural, gender, and other contexts; 6) reduction of risk and increases in production through enhanced resilience and adaptation; 7) its requirement of cross-sector, multilateral collaboration.



Farmers in sorghum field, Kola, Mali, 2003

program. While the term agroecological intensification (AEI) had never really been used formally as part of the program, the principles defining an AEI approach had long been a part of the CCRP. In 2001, as the CCRP underwent a transformation, agroecology was listed as one of the three key strategic foci. Rebecca Nelson remembers: “Agroecology was an important thing, but biodiversity and crop improvement were just as important. All three remain important to the program. They are all part of our approach to AEI.”

Thinking back to the formation of the OC in the mid-90s, Bob Goodman recalls a number of members who were “in the mindset of the agricultural ecosystem – be it economic, technical, or environmental. We were influenced by that type of thinking, which was foreign to most of the agricultural research field at the time.” The CCRP leadership team knew that to meet the needs of the ultimate beneficiaries of their research, the smallholder farmers, it was critical to formally apply the AEI framework across the entire program. When Jane Maland Cady joined the staff in 2008, she could see that AEI was a “stream running all the way through” the history of the program. “In some grants there was special attention paid to ecological approaches, but it was not clear or articulated through the entire program.”

Much of conventional agriculture research, while important, tends to be top-down and isolated from smallholder farmers and their local ecological, economic, and social realities. As a result, farmers can sometimes find the products of the research—from seed varieties and tools to policy recommendations—inaccessible, irrelevant, or non-functional. This disconnect between research and farmers can sometimes exacerbate hunger, poverty, and ecological degradation, as farmers are not empowered with the necessary agricultural inputs to be successful. While it is evident that agricultural production must increase to meet growing demand, how it should be done remains a contentious debate.

Beginning in 2008, the CCRP leadership team began considering a more intentional approach to AEI and a formalized theory of change. With an advisory committee spanning many scientific disciplines, it was a conversation that took time, inspired passionate discussion, and even caused some disagreement. Based on these discussions, in 2011, Richard Coe and Rebecca Nelson drafted a background paper on AEI and the program gathered stakeholders from both

inside and outside of the program to discuss how AEI could be incorporated into funding decisions for CCRP grants. The leadership team explored AEI as a framework for research and development for smallholder agriculture.

Over the course of two leadership meetings, the team worked to gain a common understanding and vision of what AEI meant to the program and how it could inform the grantmaking within each CoP. By doing this, the CCRP could have a stable approach at the leadership level.

The 2011 meetings helped to formalize an AEI framework that could provide a more systems-oriented approach for the program. Michael Patton, an evaluation consultant to the program succinctly summed it up: “AEI is an options-by-context model. Instead of just focusing on the front-end of grants, the system can help staff think about how to take the projects to scale. This was a big breakthrough for the CCRP’s Theory of Change.” AEI provided a flexible framework that can shift with the different communities and their changing needs. Being contextually-based had always been key to the program, but by emphasizing an agricultural approach based on this model, it became a program-wide approach to realize the CCRP’s vision and mission. The result was a clear and concise Theory of Change that identified a global diagnosis of need, how the CCRP was going to respond to this need, and what the program could contribute to solving it (see appendix).

The refined Theory of Change helped to translate the now-defined framework into an action plan “that helps to guide the selection of grants within an integrated portfolio.” John Lynam, an AC member who was involved in those discussions continued: “We also recognized that getting to a full-fledged portfolio, defined by an AEI rubric takes a long time and relates to the long-term funding that the CCRP is engaged in. Look at the transition from a commodity-based approach focused on north-south relationships in the old program to the wider and more integrated scope of activities and grants today. It is beginning to happen, but there is still a ways to go.”

This adaptive action approach undertaken by the CCRP’s leadership engaged McKnight’s Board and senior staff around how the principles could be embodied by the Foundation’s larger body of work. In 2012, they gathered to articulate how different stakeholders think about and execute their work across the Foundation’s diverse and differently structured

programs both domestic and international. They left with a Strategic Framework for McKnight as a whole. Simply put, the CCRP encouraged the Foundation to start discussions with three questions: (1) What? (2) So what? (3) Now what? Together, the questions help to focus discussions, keep them centered, and encourage deeper learning and collaboration. Kate Wolford observes: “our Strategic Framework is an institutional expression of an approach which was incubated in the CCRP?”

Grantmaking continued to grow through the first Gates grant and in 2013 the Foundation funded 56 projects for a total of nearly \$6 million in grants. 51% of that funding went to institutions based in the 12 focus countries and the remaining was split between international research institutes, NGOs and universities headquartered outside these countries. That year, the Gates Foundation made a second five year grant commitment to the CCRP. This grant was important to sustaining The McKnight Foundation’s commitment to agricultural research for smallholder farmers. While agricultural research had been steadily increasing since 2000, smallholder farmers in low income countries continued to be overlooked by most other funders of agricultural research. This was troubling as new threats emerged for these smallholder farmers. The past 10 years had seen the demand for food increase due to population growth, economic development and urbanization, and the supply of grain and food unable to keep pace. Additionally, climate change had increased global temperatures which threatened the productivity of crops and increased the likelihood of droughts and floods. Sam Dryden, of the Gates Foundation, reflected that “the commitment – the focus, the unique approach – to constructive engagement with grantees is great. The CoPs have had a large impact on the CCRP and helping to inform the Gates approach.” The continuation of funding allowed the staff to begin to think about the next iteration of the program. John Lynam elaborated:

“Research methods have started down that track and have been quite successful in developing a first generation of methods to capture the complexity in AEI research. But it is only the first generation and they are primarily applied in research programs. Now, we’re working on a next generation of methods that will be applied through the farmer research networks in terms of how AEI can be attained within whole

farming systems. If CCRP can do this, it will be well on its way to achieving something quite fundamentally important.”

Bettina Haussman underscores the shift towards conducting research at the farm level. “We have evidence that the research conducted on experimental stations is not always transferable to farmer. It is important to test options together with farmers and get their input. You can be a good scientist, but a farmer knows best on needs and fit.” The program has tracked this shift in research approach from 1995 to 2012. The projects funded from 1995-2000 were primarily using on-station research approaches only. By 2009-2012 that had shifted to a very small percentage using on-station research and over 80% using participatory research designs or co-created research designs.

To have an impact beyond each CoP, it has become clear that in addition to grant and non-grant support, CCRP stakeholders can help shape the conversation around agricultural research agendas worldwide. By working through a bottom-up approach to research, the program’s impact can be significantly broadened by participating in collaborations and using CCRP results as a resource to engage in change where others are struggling. Jane Maland Cady thought ahead: “Ultimately, we can be a place to help develop technologies, concepts, and solutions grounded in local context or reality. We can contribute our knowledge to policy questions, and help people do these things on their own. This requires advocating for and influencing research agendas, and hopefully through an

“Our formula for impact, our vision for impact, involves: adaptation, inspiration, and policy.”

open process, communities realize they have the chance to advocate for what they think should be funded by others, like the government.” Rebecca Nelson summed up the CCRP: “Our formula for impact, our vision for impact, involves: adaptation, inspiration, and policy. It’s not just about replicating things that work, it’s also about adapting good ideas from one context to the next, convincing each other that positive change can happen, and creating enabling environments for success.”

Reflections and Common Themes

The CCRP of today looks entirely different than the Plant Biology Program that was started thirty years ago, yet many underlying elements of the program remain the same such as the focus on collaboration, environmental sustainability, and building local research capacity. Erika Binger, fourth generation Board member, recalls the passionate debate and strong commitment present at the proposal review process in 1994, “It was affirming to see that we had the right people at the table to help us start CCRP. The passion and commitment of those involved hasn’t wavered since.” Over the past three decades, The McKnight Foundation has continued to learn from and improve grantmaking program, focusing on research that will fight world hunger. The continuity of the program was vital to its success, as Kate Wolford explained, “We’ve gotten clearer about our AEI focus and our willingness to do innovative early stage research and to stick with it long enough. Innovation doesn’t pay off in two or three year cycles. This goes back to the origins of a broader commitment, but we’ve stuck with it.”

The program can point specifically to many scientific advances that were derived from CCRP grants. In addition to crop advancements that could be adopted by farmers, the program’s history has helped to shape the entire field of agricultural research and development, as well as those working within it. Julio Kalazich, who served as both a grantee and is the current chair of the AC reflected: “I have been in research for over 37 years and the way that The McKnight Foundation has tried to



Erika Binger and participants at field visit to Kenya Agriculture and Livestock Research Organization field station, Kenya, 2014

solve these problems is unique. A lot of time and resources are used helping researchers on the ground so that the result can reach the farmers in a very applied way with a result that will have no doubt in quality, rigor, and application that represents the harsh environments where farmers work.”

One constant has been a focus on supporting interdisciplinary approaches to research. Carol Berde looked back: “the theme of unlikely bedfellows has carried through all iterations of this initiative as a common thread. Initially, in the Plant Biology Program that preceded CCRP, scientists in different disciplines who barely spoke to each other were brought together. In the CCRP, whether you are talking about scientific disciplines, scientists in the global north and south, or scientists and farmers, crossing lines is a hallmark of the program’s success.” Erika Binger continued: “Farmer participation, collaboration and a sharing attitude have always been important values in the program. The CoPs contribute to reinforcing these values and we are now seeing results. Research products, jointly produced by farmers and scientists, are more readily adapted and useful in the field and increased intellectual capital of researchers and development professionals, some who started as students in the program many years ago.”

McKnight’s long-term commitment to the program has been critical to its impact. Michael Patton describes: “In philanthropy you can’t overemphasize the importance of long term consistency. McKnight doesn’t come at problems with a huge amount of money, and they realize that they can’t go it alone. The consistency in style of work and building connections, this is where the Foundation has had as much influence as the direct programming.” This consistency has enabled the CCRP to evolve over time. New ideas are introduced, applied on the ground, reviewed at all levels, and revisited at annual meetings as they eventually become widely accepted, core elements of the program. “It’s a living construct.... Things continue to be revised over time through dialogue. It emphasizes the participatory and bottom-up nature of the CCRP.”

A unique feature of the CCRP is focus on the human dimension in science. Dr. Robert Mwanga, a longtime grantee of the program looked back on the support he received:

“The program had a big component on training local scientists. This is one of the most sustainable solutions possible in that even when the program ends you

Dr. Paul Kusolwa



Dr. Paul Kusolwa in a seed storage room.

Photo credit: Paul Kusolwa

Dr. Paul Kusolwa, is a bean breeder in Tanzania. The United States Agency for International Development (USAID) funded his PhD research. After the completion of his studies, the funding program was discontinued and the future of Dr. Kusolwa’s area of research in bruchid-resistant beans was in jeopardy. CCRP noticed the opportunity and began funding both the bean bruchid resistance project and the development of a molecular markers lab (bean breeding lab) at Sokoine University of Agriculture in 2009. From 2009 to 2013 Kusolwa focused on helping to create the molecular methods lab and through this work, attracted numerous research students to the program. Due to the success of these initiatives, Kusolwa received new recognition and funding from the USAID Innovation Lab in 2013 to continue his work in Africa and to collaborate with the University of Puerto Rico to develop pest-resistant beans in Latin America.

have these people who can continue to go a long way in helping to contribute to serving the food needs in their regions. Other donors do this for specific projects, but by funding capacity building beyond what was built into a grant, they were taking into account the long term benefits of leaving behind a cadre of high caliber scientists and technicians.”

Focusing on people and capacity is also complicated. Rachel Bezner Kerr, who worked with the program and eventually became a grantee, reflected that “it isn’t easy for anyone. When you involve institutions – grantees and McKnight itself – in multifaceted research it is time consuming and expensive. It is always challenging to be a grantee, and always challenging to be a donor.” In order to manage these complexities through tight iterative cycles, regional staff were attentive and interactive with grantees and to the results of the work. Understanding and honoring the complex nature of the work has been critical for a highly participatory program based in four regions around the world. The reality is that the problems of food security and hunger are multifaceted and not easy to solve. Bob Struyk found that the biggest challenge continues to be “wedding the research with the farmers in the field. There is tension that continues to exist between scientists and farmers, and while totally understandable, it will always remain a challenge.”

Jane Maland Cady reflects that making sure there are enough resources is key: “working collaboratively takes time and requires space for these types of conversations. Deep thinking was required around ‘what is AEI?’, farmer involvement in the research process, and research networks, just to name a few. One size does not fit all. McKnight doesn’t have all the answers, but we are thinking deeply and cross-sectorally.” Rebecca Nelson continued: “You don’t need to invent some brilliant new thing every 5 minutes. We can make change locally, work with existing and new ideas to try to create a process of innovation. This means linking technical change with social change. By focusing on local problem-solving we can make thoughts, ideas, and research go further. You don’t see it day to day, but with a time lapse you realize things are happening. You have to have staying power. This is an evolving story that will take decades.”

Conclusion

The CCRP’s vision reflects the values of Mac Binger and other Board members of The McKnight Foundation – a world where all have access to nutritious food that is sustainably produced by local people. CCRP grants have supported research outcomes that improve agricultural productivity for thirty years, many of which are successes in their own right. These successes – as well as the failures along the way – are only part of the puzzle. As farmers adapt new practices derived from research, the environment will eventually adapt and pose new challenges that require further scientific advancement. It is a never-ending environmental cycle that requires both patience and fortitude.

To achieve sustained food security for all people, the success of research products must be embodied in a process where people can learn, share power, and collaborate. With a place-based focus, McKnight has fostered a process that is adaptive to local contexts, offering an alternative vision of success compared to the more common commodities based approach. Kate Wolford believes the Foundation can continue to have impact so long as it is clear about its niche, adapts to changing circumstances, and connects to networks that can amplify and extend its impact. This requires an understanding that the program is a connector to help local communities realize the solutions they can bring about for the problems they identify. Ultimately, the success of the CCRP will be measured by the ability of grantees past, present, and future to effect change on the ground and influence the broader systems that create or constrain opportunities for small shareholder farmers.

CCRP Timeline

Funds Approved

• **1982**

McKnight Board approves initial funding. \$16.5 million granted through 1992.

• **1993**

New CCRP funded at \$12.75 million for five years

• **2001**

McKnight Board pledges \$41.5 million over nine years

• **2008**

Gates grants CCRP \$25 million over five years

• **2013**

Gates grants CCRP \$25 million for another five years



McKnight Board approves an additional \$6 million over three years

• **1998**

McKnight Board pledges \$47 million over ten years

• **2009**

CoPs Launched

• **2004**

Mcknight Board launches CoP pilot program in the Andes

• **2008**

Fourth CoP established in East and Horn of Africa



CoPs founded in West and Southern Africa

• **2006**

CCRP Theory of Change



The Need

Existing global **Agriculture systems** are failing to meet hunger, health and nutrition needs, are environmentally unstable and undermine the resilience of smallholder farming systems. **Research + Development systems** lack resources and structures to engage in agroecological intensification, and require investments in human, technical, social and methodological capital. Blarney recommendations predominate, which are often irrelevant to the diversity of local contexts. There is a lack of cross-sectoral collaboration, which inhibits systematic learning and innovation.

The CCRP Response

This work supports all three systems:

- 1 Grantmaking**
 - Supporting **regional portfolios** of complementary projects in four hunger hotspots
 - Grantmaking informed by **AEI** regional analyses, strategies and plans
 - Focusing on **under-researched crops**
 - Researching **systems** and components
 - Investing in research that is relevant to **smallholder farmers**

- Collaboration, learning, & communication**
 - Communities of Practice (**CoP**)
 - Meetings and **convenings**
 - Strategic **communications** (AEIs, IMx, QN, website)

- Program, region, & project support**
 - Research Methods Support (**RMS**)
 - Regional & leadership teams** support to grantees & CoPs
 - Integrated monitoring, evaluation & planning (**IMEP**)

Pathways to Change

Ag Systems

Understand and respond to local contexts, knowledge & preferences 3a, b

- Understanding **agrobiodiversity**
- Improving **crop germplasm** and access to it
- Agroecological **pest and disease** management
- Increase **legume integration**
- Diversified** systems
- Changing **knowledge and norms** consistent with AEI approaches
- Promoting **equity** through investments that favor the disadvantaged and vulnerable 3d
- Democratizing **innovation** through broader participation **Farmer research networks**

Utilization of **pract**-developed technologies, practices and knowledge 3c

AEI **principles** and evidence 2b

R+D Systems

4 Integrated **collaborative networks** across research and development

5 Innovative **AEI frameworks**, tools, concepts, principles

6 **Inspiration** through diverse forms of communications

Iterative cycles of **adaptive action**

8a, b Reciprocal linkages among **global principles** and **local adaptation** processes

Individuals, teams & networks with **move, capacity** and support to do and lead quality research (rigorous, relevant, AEI focused)

Institutionalizing agroecological thinking and practice

Informing practice and policy with evidence and analysis

Contextualized Outcomes

These provide evidence for potential at scale.

Increased **crop productivity**

Decreased **loss due to pest and disease**

Decreased use of **toxic pesticides**

Improved **soil health**

Improved **family and child nutrition**

7a

CCRP GOAL

More **resilient, multi-functional, sustainable, productive & self-provisioning** ag systems

More **effective cross-sectoral networks**

Increased **collective understanding, action and influence**

7b

AEI-supportive **changes in policies and practices** among various actors (donors, partners, projects, farmers)

Increased **capacity, incentives and resources** for individuals and institutions to **implement high quality research** that is accountable to small scale farmers

8c

More **effective, inclusive R+D system** for producing relevant knowledge, concepts, and technologies

Appendix: Interviewee List

Name	Title
Berde, Carol	Former Executive Vice President, McKnight Foundation
Binger, Mac	Former Board Member & Chair, McKnight Foundation
Binger, Pat	Former Board Member, McKnight Foundation
Cady, Jane Maland	International Program Director, McKnight Foundation
Dryden, Sam	Former Gates Foundation Agricultural Development Director
Goodman, Bob	Former CCRP Consultant
Hausmann, Bettina	CCRP Consultant, Former grantee
Jones, Richard	Former CCRP Advisory Committee Chair
Kalazich, Julio	CCRP Advisory Committee Chair
Lynam, John	CCRP Advisory Committee
Monnens, Becky	International Program Officer, McKnight Foundation
Monyo, Emanuel	Former CCRP grantee
Moore, Marah	CCRP Evaluation Consultant
Mwanga, Robert	CCRP grantee
Nelson, Rebecca	CCRP Scientific Director
Nicklin, Claire	CCRP Regional Consultant
O'Keefe, Michael	Former Executive Director, McKnight Foundation
Patton, Michael	CCRP Evaluation Consultant
Power, Allison (Sunny)	Former CCRP Oversight Committee Member
Rachel Bezner Kerr	Former CCRP Research Assistant, Current CCRP grantee
Riches, Charlie	CCRP Consultant, Former grantee
Struyk, Bob	Board Member, McKnight Foundation
Warrior, Prem	Former Gates Foundation Program Officer
Wolford, Kate	President, McKnight Foundation

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