

Ecohealth Prospectus report 2010_2015



June 2014

Note: some links in this report are not publicly accessible

Ecosystems and Human Health Program
IDRC | CRDI

Ecosystems and Human Health (ECOHEALTH) 4th phase

2010-2015

\$85.0 million CAD

ECOHEALTH FUNDING

includes \$7.9 M external funds

5%

\$1,546.4 million CAD

TOTAL IDRC PROGRAM FUNDS

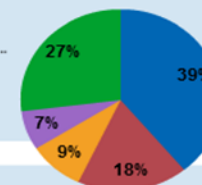
PROGRAM OFFICERS



Ottawa / Regional

RESEARCH THEMES

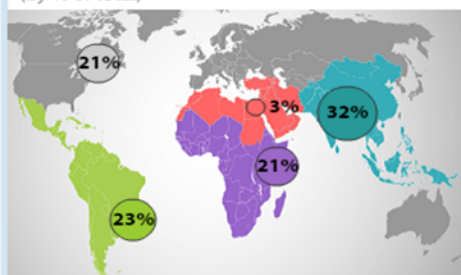
- vector-borne and/or emerging and reemerging d...
- agriculture & health
- climate change and health
- Previous Prospectus
- Ecohealth field building



62 new 132 repeat RECIPIENTS

LOCATION OF INSTITUTIONS

(by % of total)



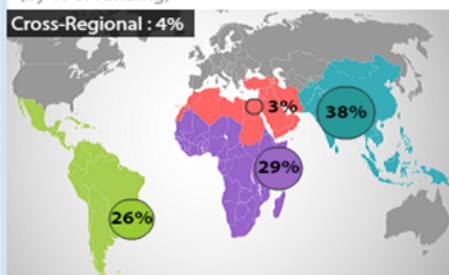
INSTITUTIONS BY TYPE



RESULTS

LOCATION OF INTENDED IMPACT

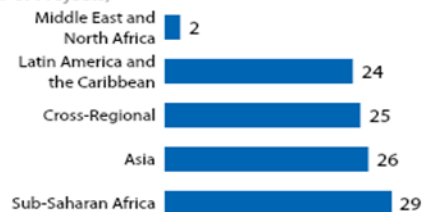
(by % of funding)



63 research PROJECTS

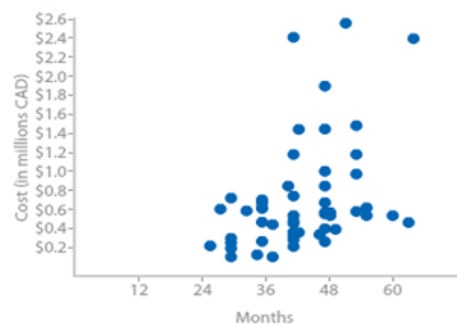
REGIONAL BREAKDOWN

(# of Projects)



PROJECT DISTRIBUTION

(by cost and duration)



PROJECT OUTPUTS

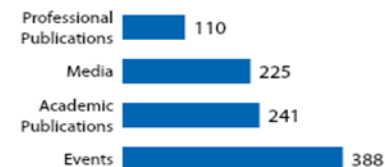


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1. Ecohealth Prospectus Period 2010-15 - Executive Summary

This document is the final prospectus report for the Ecosystems and Human Health Program. It was prepared for the External Program Review for the period 2010-2015. It presents the program's goal, implementation logic and strategy, main program achievements and outcomes, and lessons learned.

The Program's self-assessment of achievements indicates that the original goal and intended outcomes for this prospectus period remain relevant and valid. This is seen in the growing interest of both Southern and Northern researchers and the broader scientific and development communities interested in the interconnections between health, environment and sustainability of social economic development. The Program's review shows that significant results were achieved in relation to the main outcome areas that were targeted: uptake of ecohealth field building concepts and Southern leadership; and filling knowledge gaps related to social-ecological dimensions of emerging infectious diseases, and of agriculture and health linkages. The report highlights achievements in advancing the vision and identity of a growing ecohealth field of knowledge, education and practice, while at the same time generating innovative and action-oriented knowledge that benefit poor populations in middle and low income countries. Various examples cited in the report demonstrate significant outcomes in fostering leadership in field building, influencing policies and practices both locally and regionally, building the capacity of new generations of scientists and professionals in the emerging field, and mainstreaming ideas, approaches and curricula into academic and multi-lateral organizations. Progress in diversifying partnerships and the funding base for the field is occurring. The report also presents a reflection on the challenges ahead for the continued growth and evolution of the field. This is a collective effort that will require contributions by different actors and where IDRC can only be one among many. Important tasks ahead are finding effective ways of articulating global forms of collaboration and partnering in the growing ecohealth field, as well as better defining the Centre's strategic role in helping overcome obstacles and enhance progress in the field, with the ultimate goal of improving health and environmental sustainability in a world undergoing rapid social and ecological changes.

1.1 A short history of IDRC's Ecohealth Program

The Ecosystems and Human Health program (the Program) began in 1997 with the purpose of funding applied research at the intersection of health, environment and social development. The aim was to generate knowledge and evidence for improving human health and contribute to more sustainable interactions between people and ecosystems. Emphasis was given to "developing" and then "validating" ways of doing this type of

research with multi-disciplinary teams on a set of predefined stressors impacting developing countries (mining, agricultural intensification and urbanization). This ‘pilot-testing’ phase focused on introducing and applying three key concepts into applied research projects: transdisciplinarity, gender equity, and stakeholder participation (the ‘three pillars’ in Lebel 2003). Program strategy consisted in using research grants on specific topics and settings as a means of learning-by-doing. Diverse ways of applying the concepts emerged. These were collectively named ‘ecohealth approaches’. By the third prospectus period (2005-2010), there was sufficient buy-in from Canadian and Southern researchers to support regional and global collaboration through networks of scientists interested in using this style of research. A ‘networking’ phase followed that targeted funding to diverse research groups and forms of collaboration, curriculum development, and enhancing concepts and methods. The programming strategy included funding Communities of Practice in Ecohealth (COPEHs) and other types of multi-country partnerships that welcomed newcomers, built research capacity, expanded ecohealth knowledge production and the pool of scientists from developing countries and Canada. Program strategy gave more emphasis during project development to the uptake of evidence-based results by different actors (from communities to policy and decision-makers), and encouraged stronger linkages between research and policy.

The current phase (2010-15) is one on ‘field-building’. It aims to foster growth and evolution of an emerging field of research and practice, expanding the body of interested and engaged actors, and building and deepening knowledge and know-how on research for better health, environment and social-economic development. Ecohealth is now seen as an emerging field, in joint evolution with a broader and growing set of closely related and compatible initiatives and bodies of scholarship (Table 1). Accompanying this evolution of ideas and funding strategies was a gradual shift in making explicitly and systematic in the design of ecohealth research and practice a set of six principles (Charron 2012) instead of “three pillars”. This was in reaction to the gaining of popularity of the pillars (transdisciplinarity, participation, gender equity) at the expense of losing over time the emphasis on the other core ideas of sustainability, research to action, and systems thinking as a means of integrating the intent of research for development in ecohealth approaches which was there from the beginning (Forget and Lebel 2001).

Thematically, the program also changed over the years, from an initial focus in 1997-2004 on ‘traditional’ environmental health issues linked to pollution, mining, urbanization and intensification of agriculture, to a wider spectrum in 2005-10 that included occupational health in small and medium enterprises, emerging health issues in urban slums, climate change and health (re water and food security), and communicable diseases (vector borne and emerging and re-emerging diseases (EIDs), including zoonoses from livestock and wildlife). This broadening of entry points responded to the growing interest in the approach by developing country scientists, but contributed to fragmentation of the

portfolio, limiting funding opportunities to bring research results to scale. The current prospectus period provides continuity in a reduced number of topics accompanying efforts in ‘field building’: agriculture and health linkages, climate change and health, and prevention and control of EIDs and vector borne diseases.




Ecosystem and Human Health Program		
1996 	2003 	2010 
Piloting Ecohealth Approaches	Networking Ecohealth	Field-Building Health, Environment and Social-Economic Development
<ul style="list-style-type: none"> • Context-Specific Problems • Testing and Validating Ecohealth Approaches to Research • Local , Multi-Actor Teams • Local to National Reach 	<ul style="list-style-type: none"> • Country to Regional-Specific Themes • Multi-Country Partnerships • Communities of Practice, Ecohealth Networks, Competitive Call Cohorts • National to Sub-Regional Reach 	<ul style="list-style-type: none"> • Sustainable Evolution of Research & Practice • Ecohealth as Sub-Field • CoPs, Consortia, Inter-Network & Inter-Agency Collaboration • National to Regional to Global Reach

Table 1. Evolution of Ecosystems and Human Health Program

1.2 Program goals and logic of change (2010-15)

The end goal of the Program is poverty reduction and improved social and economic development, in alignment with IDRC’s corporate goals and strategy. This is to be achieved by improving human health and sustainability of ecosystems in developing countries. A basic premise is that ecohealth research can make substantive contributions in attaining these goals by informing and guiding a mix of transformative, evidence based changes in policy and/or policy implementation, behaviours and practices of relevant actors. To this end, the program aims to strengthen and consolidate the emerging field of ecohealth, and encourage a higher demand for research and evidence by policy and development actors. Program funding targets the enhancing of leadership in the field and its growth, in partnership with organizations and institutions in developing countries. This is being accomplished, hand in hand, with improving the state of knowledge of health problems rooted in ecosystems use, reinforcing research capacities, disseminating knowledge and approaches to research, and improving the use of research results in guiding change. The program also supports the application of ecohealth approaches to fill knowledge gaps on particular topics related to health, environment and agriculture.

In line with the logic outlined above, the Program targeted two outcome areas, field-building leadership and addressing knowledge gaps on specific topics: disease emergence, and human health and agriculture. Table 1 in the current prospectus (see [page 10](#)) presents a summary of intended progress in both outcome areas along a gradient from what would be considered minimum impact (outcomes achievable within the five-year period), to high impact (outcomes that may take more time and be more dependent on external factors beyond IDRC's sphere of influence).

1.3 Program strategy and implementation

The program invested resources (e.g. proposal development efforts, research grants, program monitoring and feedback) in the two outcome areas above. In both, emphasis was given to capacity building in knowledge translation and uptake of results. The sequence of implementation was followed as originally planned (re fig.4 of prospectus [page 15](#)), with a number of changes and adjustments along the way. Program strategy and implementation were shaped and influenced by different contextual elements. One was the global nature of the program and heterogeneity in opportunities and challenges between regions. A second one was related to staffing changes within the program, while a third one concerned corporate context (including evolution of corporate strategy and the impacts of budget cuts from 2012). Strategy choices were made to better adapt program delivery without losing coherence in program-level objectives and intended outcomes. Efforts were also made to draw lessons and learning from strategic decisions, and take advantage from 'leverage' opportunities that contributed or enhanced program-level outcomes. These influences and implications in program implementation are discussed in the sections that follow.

Strategic position at outset of prospectus period

In 2009, recognizing the mostly-mature status of ecohealth-focused programming, the program leader, with strategic advice from senior management, positioned the concept note for a fourth phase of Program funding around strengthening institutions in the global South to assume greater leadership and visibility in moving ecohealth research forward, while continuing to develop promising and much newer work on emerging diseases. While not made explicit in the prospectus approved by the Board of Governors in 2010, program planning and delivery aimed to hand over to others much of IDRC's lead-role in convening researchers, practitioners, and research-users in ecohealth, as well as continue to leave in the hands of emerging experts in the field the further conceptual development of ecohealth, along with the recruitment of new thinkers. This implicit transition underpinned the program's strategy and emphasis on leadership, institutionalization, and networks, as well as partnership and influence with other donors inclined to support this type of work. The program's decisions and approaches from 2010-2014 reflect a transition from IDRC staff away from being "go-to" initiators, convenors and lead advocates for ecohealth,

taking on a less protagonist role closer to that of a conventional research donor. This is being accompanied by grant recipients and strategic partners assuming stronger, recognizable “ecohealth” voices in regional and global debates on environmental sustainability and health (for example, the influence of ecohealth partners on the One-Health movement and vice-versa), and social justice and development. Over the past 4 years, the Program has been preparing the ground to ensure a strong, effective, and self-sustaining endeavour in ecohealth less dependent on IDRC. The Program is confident that it has been mostly successful in this, with some challenges and risks remaining (discussed further in section 2. Program Outcomes).

Response to last External Program Review

Recommendations from the previous External Review (2005-08)¹ were used as substantive inputs in planning and implementing this prospectus period. Progress and achievements on these are summarized below with further details in later sections.

- ***Support the further development of the ecohealth concept “as discipline and practice”.*** An update of IDRC’s version of ecohealth research was published (see Charron 2012). French and Spanish versions of the book are just being published in 2014. Continued support to ecohealth communities of practice and new modalities of collaboration (e.g. “field building leadership grants”) have also contributed to expand and enrich a common understanding of ecohealth and its application across regions and stakeholder groups. Co- sponsorship of symposia and strategic conferences and workshops around the world were also supported.²
- ***Clarify the niche and role of IDRC in Ecohealth and ensure visibility.*** Contributions to field-building by strengthening Southern leadership in ecohealth became a key Program focus (see next section). Contributions to theory and practice and more systematic attention to attribution from IDRC’s input were also pursued³.
- ***Strengthen the quality of research results and the evidence base.*** Greater attention was given to clarifying expectations during proposal development related to knowledge and development outcomes, including more rigorous methodologies. More encouragement and support (e.g. funding of “writeshops”)⁴ were provided to dissemination of research results and peer-review publications. Greater emphasis was given to monitoring and evaluation (M&E) functions in projects (e.g. their incorporation into the design of proposals and building of capacity within project teams). A recent effort is underway in LAC to also strengthen knowledge management with lead investigators from eleven past and on-going ecohealth projects across the Americas.⁵ Several external evaluations of grants were also commissioned during this period⁶. Further, a Program discussion on research quality in ecohealth was carried out over the last year and an internal working draft position paper produced. Its purpose was to advance reflection within the Program and inform proposal

development and project monitoring (as opposed to carrying out post-hoc assessments of research). A special session at the coming Ecohealth 2014 conference was submitted and accepted. Its intent is to engage the broader ecohealth community in moving forward discussions on research excellence for the field⁷.

- ***Support program capacities to manage the consolidation and shifts in the Program.*** A number of changes were introduced in information collection and knowledge management systems. These included: creation of a [peer-reviewed publications database](#); tracking forms (Program Level Outcome Tracking tool [PLOT](#)) and a database for project outcomes (see [Outcome tracking library](#)); and modifications to guidelines for the preparation of final technical reports ([here](#)) that put emphasis on ecohealth narratives of the work accomplished, documentation of outputs, as well as in describing, reflecting and learning about project outcomes.
- ***Develop a more integrated strategy for achieving and scaling up capacity building.*** Significant investments in capacity building and its scaling were made through the continued funding of communities of practice in ecohealth as well as through the field building leadership grants. Achievements are summarized in the section on “Mainstreaming and institutionalization” under Program Outcomes.
- ***More purposefully support policy influence as a key management skill and expectation.*** The requirement of policy influence as an expected outcome of grants was stressed during this period. A closer linkage between policy and practice was also encouraged by strengthening knowledge-to-action strategies in the design and implementation of grants. Progress and achievements are summarized in the section on “Contributing to policy and practice in health, environment and development” under Program Outcomes.

Field building as a unifying theme and strategy

The Program’s newly explicit focus on building a field of research and practice represented a major conceptual shift in this prospectus period. It required significant efforts in changing our own mindset and influencing that of grant recipients and collaborators about the overall nature of our work – from promoting and financing the application of an “approach” or style of doing applied research on health and environment, to conceiving Program investments and partnership building as means to enable and promote the emergence of a field. This shift was spearheaded in dialogue and collaboration with several grant recipients (see Mallee et al 2012, Parkes 2012, and Saint-Charles et al 2014).

Field-building is unlike constructing brick and mortar structures. No clear moments exist either when a sub-speciality or style of research and practice becomes a recognizable

field in its own right. Formal literature about field-building is scant and is often informed by hindsight. We know that fields emerge and grow through the efforts of many individuals and groups, working in isolation or collaboration, in harmony and disharmony (Bourdieu 1975, Glison et al. 2011, Sheikh et al. 2011). A group of peers joining forces to advance excellence in a particular endeavour with the intent of making a distinctive contribution seems to be one requirement. Growth and longevity, as well as renewal and succession in institutions such as an academic journal, and/or association (e.g. in this case, the International Association for Ecology and Health and the journal EcoHealth) are indicative of emergence (see also Green 2009, Parkes et al. 2012).

Our thinking is that fields of research and practice are comprised of the following characteristics:

- groups of people who are aware of each other and interact regularly;
- a set of shared visions, ideas, principles of action, and some agreed approaches and methodologies;
- mechanisms (explicit or implicit) for defining and setting the boundaries of the field, differentiating it from other fields and establishing external recognition, validation and legitimacy;
- institutional practices and structures such as research teams, policy development processes, agreed processes for professional recognition, peer review systems, journals, membership associations, and means of quality control;
- communication mechanisms, such as conferences, websites, discussion lists;
- resources including research sites, funding, skills particular to the field, an established knowledge base and sources of expertise; and
- broad-based support and champions promoting aims and practices of the field.

In this report, we focus on ecohealth as a growing field of research, education and practice that addresses health and environmental issues arising from interactions of societies and ecosystems. However, as noted in the beginning of this document, the ecohealth field itself is seen also as part of a broader mosaic of other styles, approaches and perspectives (e.g. ecological public health, resilience thinking, One Health, healthy cities, and ecological economics to name a few) with greater or lesser thematic intersections or collaboration between them. In one way or another, all seek the common goal of improved health and environmental sustainability as underpinnings for better social-economic development. Our work and achievements in this reporting period focus on the ecohealth field within this larger open-boundary perspective (see figure 1).

At best, building a field is an ambitious undertaking with a high level of uncertainty. Potential contributions by any one organization are limited, especially when resources (time, money and personnel) are modest. Efforts in this prospectus period targeted the incorporation of a field-building intent in all program activities, starting with field-building leadership grants described a bit later. Implicit in Program implementation were three general rules to strengthen the field: (i) broker a wide diversity of relationships; (ii) encourage different perspectives in design and implementation of funded activities; and

(iii) expand field boundaries beyond disciplinary and sector-based interests. All three are expressions of ecohealth principles.

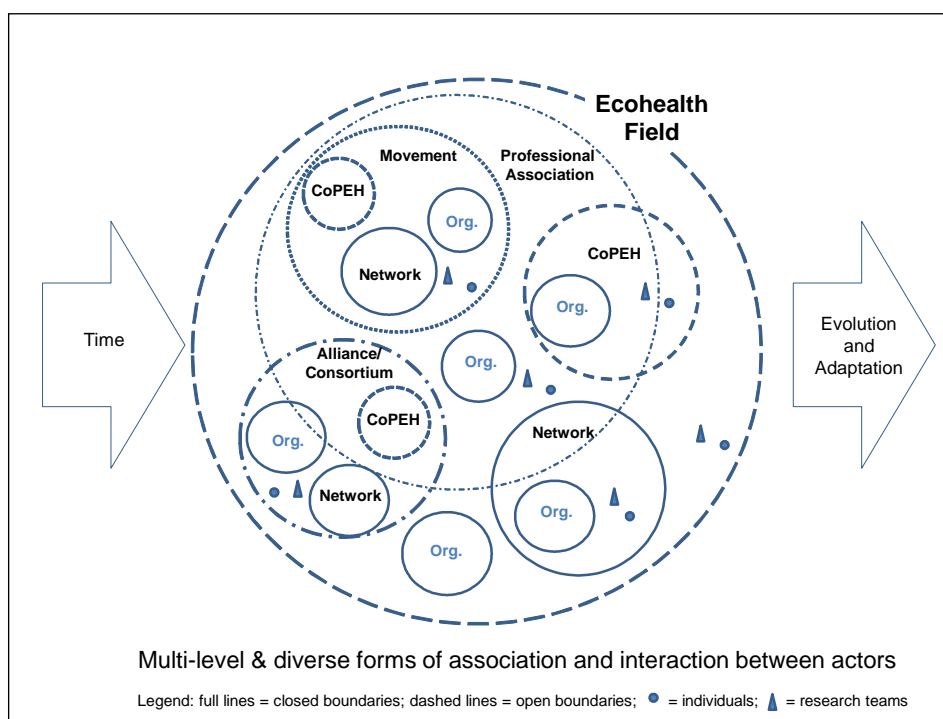


Figure 1. The evolving field of ecohealth

Table 2 below presents different strategic actions or guides in field-building that flow from the three rules and that defined program delivery. Diversity was seen as an essential element of field evolution, and this idea was the backbone of the strategic approach followed. This did not preclude an initial programming focus on a reduced set of topics or themes (vector borne diseases, emerging diseases, and agriculture and health linkages).

Program implementation profited from IDRC's ability to broker dialogue and collaboration across multiple actors (from different disciplines and sectors, with different priorities and needs), with overall coherence provided by our key intent of contributing to the building of a field of research, education and practice for better health, environment and social-economic development.

Broker relationships	Engage different perspectives	Expand field boundaries
<ul style="list-style-type: none"> • Broker collaboration for a social collective good • Help develop a collective vision of the field • Support mentoring and capacity building on ecohealth research • Foster distributed forms of leadership • Fund and encourage diverse forms of partnerships and networks globally 	<ul style="list-style-type: none"> • Allow for diversity in worldviews and ideologies • Support interactions between different groups (networks, consortia, Communities of Practice) • Allow for dialogue & mutual influence between scientific and practical knowledge (i.e. help build a body of transformative knowledge) • Imbed transdisciplinary thinking and cross-sector engagement in funded activities 	<ul style="list-style-type: none"> • Promote systems framing of health and environment issues • Fund applied research for social outcomes (i.e. help build a body of transformative practice) • Encourage expansion of boundaries (from ecohealth “approaches” to ecohealth “field” to broader field of health, environment and society)

Table 2. Field-building strategic actions or guides in Program implementation

Project development and monitoring

All projects funded in this prospectus period followed a set of general criteria standard to IDRC that guided proposal development (see any of the Project Approval Documents cited in this report). This set of criteria includes: use of lessons learned from similar past experiences; relevance to locality, country, and/or region where the research is taking place; relevance to IDRC and Program; robustness and credibility of project design and methodologies; relevance of intended outputs and outcomes to the achievement of project objectives and goals; ethical considerations and steps to address them; identification of risks and mitigation procedures (re. the various project stakeholders such as researchers and communities, as well as to the Program and Centre, including reputational risks).

The criteria were applied in ways that reflect as best as possible the Ecohealth research principles. This meant prompting grant recipients to pay attention during the development of projects (i.e. proposal development and inception phases) in:

- (Re-) framing of the research problem in terms of outcomes sought, systems thinking and multiple perspectives of different actors (researchers, government, civil society, local communities).
- Refining research questions and methods to reflect a transdisciplinary approach, including synergies and trade-offs between concepts and ideas from different disciplines as well as from other forms of knowledge and local experiences of different actors.

- Requiring an appropriate mix of expertise in the research team and partners suitable for the proposed project design.
- Requiring relevance of research contributions to the wellbeing of vulnerable people and to the mitigation of harm to ecosystems, taking into account gender and equity dimensions and appropriate engagement of relevant stakeholders.

Monitoring of projects by Program Officers and project completion reports reflect a mix of project and program level dimensions, including:

- Performance (where are projects succeeding, how much, and in what ways?)
- Relevance (merit and worth) of project to recipients, beneficiaries and Program
- Oversight and compliance of project implementation
- Program improvement in developing and overseeing ecohealth projects
- Program knowledge development (e.g. alternative ways to deliver programming)
- Contributions to program outcomes

1.4 Overview of program portfolio

From the outset of this prospectus period, the program faced the challenge of defining success (and progress markers) in strengthening field-building leadership. A framework was developed iteratively between 2011 and 2013⁸ and thought leaders from outside IDRC were engaged (see Saint-Charles et al 2014). A team of two evaluation consultants was also engaged to guide our assessment and learning from strategic decisions in program implementation associated with field-building leadership through a developmental evaluation process⁹. The program defined the theoretical elements of a field of research and practice, as well as an understanding of field-building and of IDRC's field-building roles, past and present (see sections on Program Outcomes and Lessons Learned). It used this understanding to adjust and refine programming strategy. By programming strategy, we mean grant-making (including proposal development), strategic engagement of partners and allies, as well as IDRC's messages and approaches of interacting with recipients and partners.

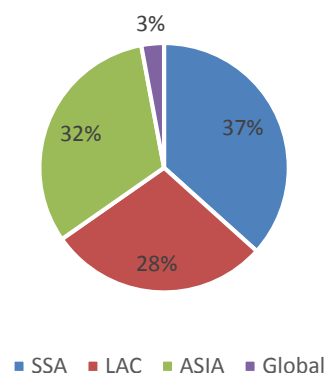
The program was implemented globally as indicated in the Program's dashboard synthesis. Both the geographic and thematic breakdown graphics presented below correspond to the projects approved under the current prospectus cycle, from April 1st 2010 until present (see [program portfolio 2010 to present](#)). The [dashboard](#) however, provides a longer timeframe of investments, counting projects that were active as of April 1st 2010, which in some cases go back to projects initiated in 2007 or earlier, thus, developed under the previous prospectus logic.

Regional Breakdown

The geographic distribution of intended impact between regions (in terms of % overall funding of projects from 2010 to present) was: 3% global; 28% LAC; 37% SSA, and 32% Asia. Limited funding allocations in the Middle East were made through partnerships with other initiatives. These amounted to about CAD 1 Million or 3% of total allocations to ecohealth projects in this prospectus period when these other funds are added¹⁰.

Source for this graphic: [program portfolio 2010 to present](#)

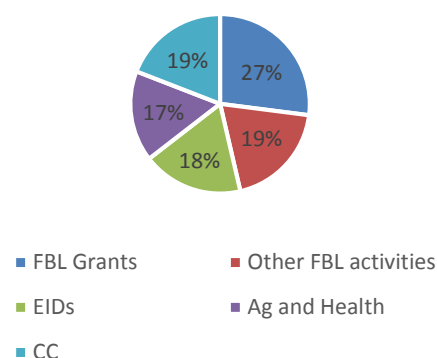
Figure 2. Projects regional breakdown



Thematic Breakdown

Total program funding allocations for the period April 2010 to March 2014 were CAD 33.4 million. As shown in the graphic below, an estimated 15.5 million (46%) of the total, were earmarked to field-building leadership grants and closely associated activities¹¹. The remaining funds show a balance between the other themes: agriculture and health linkages; Emerging infectious diseases; and Climate Change (see Figure 3). Source for this graphic: [program portfolio 2010 to present](#).

Figure 3. Funding by theme



In essence, all projects funded during this period included a field-building component: i.e. funding for capacity building of young scientists, for networking opportunities to present and share findings within and between regions.

All funded activities had the dual purpose of expanding and strengthening the field. This is reflected in the mixed distribution of 'first-time' and 'repeat' recipients for all projects that were active in 2010. Out of 119 funded organizations, 91 were new to the Program (76%) depicting efforts in field expansion. There was also a deliberate strategy over the last decade to fund "networked" projects¹². This incorporated a balance between old and new actors, where 'repeat' recipients helping in the mentoring of newcomers. The balance between novice and experienced researchers in ecohealth was achieved through a combination of open calls for proposals, invited calls, funding of unsolicited proposals,

and partnerships with targeted organizations. Percent funding through competitive processes (open and invited calls) was 53% for projects active in 2010. This percentage is slightly lower (44%) for projects funded from 1 April 2010 to today.

1.5 Implementation of program modalities

Field-building leadership grants (Outcome area 1)

Ecohealth field-building leadership grants and related activities represented the largest investment in time, effort and resources in this prospectus period. They include: one [consortium in Latin America and the Caribbean](#), one [consortium in South East Asia](#), and two ‘Ecohealth Chairs’ in Africa¹³. In keeping with a then-emerging trend in some programs at IDRC (Think Tank Initiative, Canadian International Food Security Research Fund) and with advice from senior program management, the ecohealth Program sought to explore how a few large investments with key partners and recipients might accelerate impact at a regional scale, including more opportunity for policy influence, and better opportunities to leverage additional resources. The strategy was based on the concept of network centres of excellence (see concept note presented to IDRC Board of Governors in November 2009), combined with the program’s knowledge of both strengths and weaknesses of Communities of Practice and Research Networks previously supported by the program. The program sought to engage strong networks and organizations from developing countries with a convening capacity to bring together scientists, policy makers, and practitioners with complementary spheres of influence and with an expertise and experience in implementing ecohealth research. Rather than supporting single institutions the program favored collaborative arrangements between several organizations, to harness a broader range of capacities and interests, and to avoid risks associated with over-concentrating expectations and resources in a single individual or organization.

From the outset, the Program engaged research partners in the design of the field-building leadership initiatives, an approach consistent with reinforcing southern leadership. In summer 2010, the Program initiated a consultation with key partners and stakeholders in LAC, culminating in an agenda setting workshop that defined the key components of this first ecohealth field-building leadership grant: excellence in research, and taking research results to scale; graduate training and capacity building of professionals, practitioners, and policy-makers; and, participation of civil society (see [call document](#) – in Spanish). A single consortium grant was awarded in Dec. 2010, under the leadership and administration of Mexico’s National Institute of Public Health (INSP) following a short competitive process.

The program had a shorter track record in SE Asia (since 2005 only) and largely focused on infectious diseases. While initially this was thought to be an advantage favoring a large consortium grant similar to what was done in LAC, by mid-2011 rivalry and mistrust among some grant recipients developed. This, together with activities of larger donors having a narrower focus on emerging disease programming (e.g. USAID), were posing considerable risks to the program's field-building aspirations. After some internal debate, the program agreed to a hands-on, facilitating role in convening representatives from all our key partners and networks in the region, shaping the initiative with them, and guiding the research focus toward an agriculture-related theme, to differentiate from the regional USAID program focus on detection of pathogens with pandemic potential.

Seven organizations jointly presented a single field-building leadership proposal, with activities inspired by the initiative in LAC: research; capacity building; and knowledge translation. The grant was approved in Sept. 2011¹⁴ but had a long inception phase, struggled to find a model of effective governance, and continues to struggle in implementing effective leadership in knowledge translation albeit some faster progress in recent months. The multi-recipient model was associated with very high grant administration costs for IDRC.

The program's analysis of the field-building situation in Africa, informed by the experience in LAC and SE Asia, led the program team to a revised approach to field building leadership in Africa (see [Africa Chairs strategy](#)). Despite the presence of several strong ecohealth researchers, there were few organizations deemed capable of convening a field-building consortium. Institutional and geo-political risks were more significant than in SE Asia or LAC. After 2012, the program underwent substantial changes in staff and smaller budget. The Program developed a call document "[EcoHealth Chairs on Health and Global Environmental Change in SSA](#)", coincidentally a similar modality being used by other donors in Africa of late. A consultation workshop was held in Nairobi with over 30 participants from 9 countries inform the shape of the competitive call for proposals. The first Chair was approved in Feb. 2014¹⁵, surprisingly to a new-to-IDRC recipient. A second proposal is currently undergoing further revisions and is expected to be funded by September 2014¹⁶.

Thematic programming (Outcome Area 2)

Thematic niches on infectious diseases (emerging and traditional vector borne diseases) and agriculture and health linkages were pursued, providing continuity to past programming, while keeping open possibilities for reacting to new strategic opportunities such as furthering support to climate change and health research. The program employed a range of modalities to explore how ecohealth could contribute new knowledge on the themes above. Projects were developed from unsolicited concept notes, solicited ideas, as well as through limited use of competitive calls.

Investments in climate change, health and adaptation in this prospectus period included a CAD\$7 million allocation as part of IDRC's activities supported through the Government of Canada's Climate Change Fast Start Finance Initiative (37M in total for Climate Change and Water and Ecohealth). Given the time constraints and already-stretched resources within the program team, an implementing partner was sought. Building on several previous successful ecohealth collaborations, IDRC again partnered with the WHO's Special Programme for Research and Training in Tropical Diseases (TDR) to launch a competitive call for research on Climate change, water management and vector-borne diseases in drylands of Africa. TDR is administering the initiative and provides technical support, mentoring and capacity building to a set of five winning multi-disciplinary projects in Africa¹⁷. The program also funded a project in Colombia and Bolivia on Climate change, vulnerability and health¹⁸ addressing water-related diseases.

As per the prospectus, the other significant investments in this period focused on agriculture and health, and emerging infectious diseases. There was a significant overlap between the two themes, with several projects investigating the links between wildlife and/or livestock health with public health. This included a competition in LAC that focused on policy-relevant research¹⁹ and a co-sponsored project with the International Livestock Research institute (ILRI) on small livestock keepers and safety of food production in peri-urban settings in South Asia²⁰.

The last four years also saw a large turnover of Program staff and reduction in the size of the team by 2.3 FTEs by June 2013 (see [timeline](#)). One consequence was less programming in the Middle East than originally foreseen (noted earlier). Two other topics in the prospectus received less attention than originally planned given limitations of staff resources. One was strengthening gender and social equity dimensions in ecohealth research. The second was a limited exploration on the use of ICT tools in projects, originally proposed in the prospectus.

2. Program Outcomes

Our programs' body of work in this prospectus period was comprised of two parallel, but closely interlinked, streams of activities aimed at achieving planned outcomes in knowledge generation and field-building. The examples that follow depict results of investments that generated innovative, salient and actionable knowledge different from conventional thinking and approaches in public health and global development. They were complemented by investments that helped build different forms of collaboration and supportive environments allowing researchers to lead and take ownership in the building of the field. Given this dual track, the presentation of Program outcomes is made in an aggregate manner, using different project-based outcomes to illustrate contributions to six interrelated program-level elements and associated outcomes at this higher level. These include:

- **Shared vision and identity** - outcomes on evolution and uptake of key concepts, including the very idea of an emerging field;
- **Body of knowledge** – outcomes on the generation of transformative knowledge (see “Contributing to a knowledge base for the field”);
- **Actors and forms of collaboration** – outcomes on expanding the field of ecohealth and its uptake (see “Mainstreaming and institutionalization”);
- **Leadership** – outcomes on strengthening a distributed leadership in field building (see “Fostering distributed leadership across the South and North”);
- **Transformative action** – outcomes on policy and practice influence (see “Contributing to policy and practice”);
- **Sustaining evolution** – outcomes on building sustainability in the growth and evolution of the field (see “Diversifying partnerships and funding base”)

The above six elements were specifically targeted by our Program as a means of guiding the development and implementation of grants funded during this prospectus period. They cover all field building strategic actions presented earlier in Table 2.

2.1 Shared vision and identity

Two main concepts were promoted by the Program during this period that related to joint contributions of Program and partners to the vision and identity of the field. Both resonate with the growing ecohealth community. One was the strengthening of ‘systems thinking’ in projects funded. This was given much more emphasis than in previous times and led to the explicit promotion and use of ‘ecohealth principles’ in project development and Program communications (Webb et al 2010, Charron 2012, Parkes 2012, Horowitz 2012). The second major emphasis targeted the articulation of ecohealth as a field (as discussed earlier). This change has been unsettling to some researchers who feel more comfortable in moving towards a narrower niche and advocate for the standardization of ecohealth approaches. Some tension and debate continue within the field about ecohealth being viewed as a tightly defined style of research (or even an emerging discipline) versus an adaptive set of principles for applied research and action. In our view, the latter is more congruent with systems thinking and transdisciplinarity, and offers a greater potential for expansion, evolution and sustainability. The idea of an emerging field seems to be gaining traction in the ecohealth community as witnessed by independent writings of some of its active and respected members cited earlier, the work of the International Association for Ecology and Health and associated conferences from Merida, to London 2010 to Kunming 2012 to Montreal 2014, where the central theme of this last one, 5th Biennial Conference of the Association for Ecology and Health²¹, frames ecohealth as an open-boundary and growing field.

2.2 Contributing to a knowledge base for the field

As in previous prospectus periods, scientific knowledge and research quality were considered essential elements of our work, but not sufficient. An explicit intent was to support the production of practical knowledge for guiding change (or “transformative knowledge”) by grounding action-oriented research in social-ecological systems with a systems thinking and sustainability lens. The funded work encouraged the generation of knowledge with a multi-sector and multi-actor vision of a different future, new practices, new policies and/or new ways of implementing them. These are in essence key characteristics of the knowledge base for the field that we have been striving to help build. It is an ambitious task. Progress and success take time and typically require a better understanding of the emergence and drivers of health threats, their transmission and amplification, and possible responses that are socially and politically feasible.

Outcomes related to transformative knowledge

A number of examples over the Program’s history indicate the potential and relevance of this type of work in tackling widely different health challenges (see Charron 2012). Within the shorter time available in this prospectus period, four examples stand out where ecohealth projects progressed in guiding local paradigm shifts that tackled health problems affecting poor populations. These are briefly presented below. Together they illustrate what success looks like when informed by transformative knowledge. These are illustrations from different social, political and cultural settings in different regions of the world. Two examples (Chagas disease prevention in Central America; and soil productivity and child nutrition in Malawi) span multiple phases of Program support. The other two (reigning in the widespread disease burden of liver fluke in Thailand, and rabies surveillance and control in Bali) are from recent grant recipients. Lead researchers in these last two cases had a history of work in tackling the respective health problems. Adoption of ecohealth approaches enabled them to make stronger and faster progress.

Chagas disease prevention in Central America. Previous IDRC funded ecohealth research in Guatemala identified and perfected housing improvements, community education and collaborative (government-community) health prevention actions. These were shown to be cost-effective alternatives to pesticide spraying in the control of the main disease vector for the region (*T. dimidiata*). In 2011, applied research on the transfer and scaling up of interventions was launched in border areas between El Salvador, Guatemala and Honduras. The project has been successful in engaging national control programs of the three countries and in transforming the ways and behaviours of people (program managers, vector control workers, community leaders and community dwellers) in preventing disease transmission. Over 26,600 people (5,300 families) in 30 communities have benefited so far from the innovative housing techniques and from the uptake by a wide variety of other donors that joined along the

way. These include: World Vision in Guatemala and Honduras, Japan International Cooperation Agency in Nicaragua, United Nations Development Program in Guatemala, FAO in Honduras, and the Food Security Central America Regional Program among others. The project also produced new scientific knowledge and techniques to monitor and assess Chagas transmission. Testing of blood meals from disease vectors was used as a means of tracking the switching away from human blood to chicken blood in the bug's feeding habits that resulted from the new interventions. For more details see narrative of initiative in endnote link²².

Soil productivity and child nutrition in Malawi. At the outset in 2000, the nutrition situation in the country had changed little from the previous 40 years, with 46% of children under five years being too short for their age and 20% underweight. Unsuccessful government efforts to increase food security were based on subsidies for fertilizer and maize. IDRC's funding of the Soils, Food and Healthy Communities and subsequent funding phases that incorporated farmer-led experiments produced important results: nitrogen-fixing plants grown in the same field ("doubled up" crops of pigeon pea and groundnuts) improved maize yields the next season; legume cultivation improved soil quality, reduced yield variability, provided important sources of protein and micronutrients, and diversified local diets. Over 7,000 families now benefit from legume crops, nutritional education, and community involvement. Nutritional status improved significantly in 4,000 children being monitored – with average weight gains of 1 kg at 1 year of age, and 1.5 kg at 3 years. On-going research is addressing linkages between food security and social resilience to climate change and HIV/AIDS, examining now how farmer-led research can inform adaptation strategies and policy responses to rising food vulnerabilities in Ekwendeni and Kasungu (Central Malawi). In a recent visit to the country by the United Nations Special Rapporteur on the right to food, De Schutter highlighted the project's approach as a model to emulate. A grant of \$2.5 M from Canada's Department of Foreign Affairs Trade and Development obtained in 2013 will support the scaling up of research findings to other parts of the country. For more details see narrative in endnote link²³.

Reigning in the disease burden of liver fluke in Thailand. For well over a decade, the country has experienced the highest incidence in the world of a fatal type of liver cancer caused by the liver fluke parasite. A new strategy for controlling pathogen transmission based on ecohealth principles was developed and implemented in the Lawa Lake area in Khon Kaen province. By using a complex socio-ecological systems perspective, the project was able to characterize the multiple socio-economic, cultural, environmental and livestock-related pathways of helminth parasite transmission in the 6 study countries. It is now known as the "Lawa Lake model" – a local community-driven initiative that combines drug treatment for humans and animals, intensive community and school-based health education, environmental modification of snail habitats, and ecosystem monitoring of helminth transmission. The infection rate of parasites in villagers was cut in half and infection rates in local fish species (which play a key role in transmission of parasites to humans) were reduced from 70% to less than 1% following the interventions. As a result of this success, the Lawa Lake Model is gaining national and international recognition, and is being expanded to other parts of

Thailand and neighboring Mekong countries. For more details see narrative in endnote²⁴.

Rabies surveillance and control in Bali. In Southeast Asia, the ‘Hotspots’ project is addressing the threat of infectious disease emergence and re-emergence in tropical tourist centres of the region. Using an ecohealth approach, the research team from Bali Indonesia characterized the socio-economic, demographic, environmental and epidemiological drivers of rabies emergence after it first appeared on this island in 2008. This work contributes to a growing body of knowledge on rabies in Bali, complementing the earlier work of EcoZEID, an ecohealth initiative that focused on zoonotic diseases of public health relevance (see summary included in Animal Health and Human Health narrative²⁵). The Bali team reviewed and analysed existing rabies surveillance and reporting systems, and identified a breakdown in communication and case reporting between rabies workers, veterinary officials and local health centres. Large numbers of high risk animal bite cases that were identified by rabies workers were not been adequately transferred to veterinary and human health officials. In response to this finding, the project worked with municipal and provincial government actors to develop an integrated surveillance system for rabies monitoring, control and response that joined efforts of local disease control, medical and veterinary agencies. This system (formalized in an MOU agreement) created a framework for previously siloed agencies to develop coordinated responses, control and preparedness measures towards rabies. Additionally, the integrative model has created opportunities to develop multi-sector interventions addressing other emerging infectious diseases such as dengue which share many upstream drivers (rapid urban development and poor waste management). These systems-oriented, upstream-targeted strategies are building community resilience, enhancing environmental sustainability as well as improving efficiency in responses through integrated disease control systems. For more details see narrative in endnote²⁶.

The above examples are emblematic of what can be achieved with incontrovertible evidence, strong leadership and advocacy from the country, and good policy engagement or engagement of community actors with capacity to take results to scale. They are not atypical – but not easily achieved. They are also significant contributions to the knowledge base of the field. They share two common achievements: (i) a better understanding of local drivers and factors affecting specific health threats (at household/ farm to community levels); and (ii) the use of new knowledge to prompt changes in people’s livelihoods and everyday interactions with their environment in ways that help reduce health threats. They also provide an illustration of the type of evidence that can guide the further development of the field’s knowledge base. These include: intended increase in reach of ultimate beneficiaries exposed to the health threats; their active engagement in responses; effectiveness demonstrated in real time with real actors (community members, government officials, academics, professionals from different sectors, and donors); adoption of active roles by different organizations in responding to the health threats; and

uptake of new knowledge by these institutional actors which guides new ways of doing needed work.

Filling knowledge gaps in emerging and re-emerging infectious diseases

Projects targeting knowledge gaps on emerging and re-emerging infectious diseases responded to specific research interests from multi-disciplinary teams, rather than our Program commissioning studies on specific knowledge gaps. Examples cited below illustrate early contributions as intermediary steps in making the case for change. They often help make more explicit lose-lose situations where people's health and livelihoods are harmed by a mix of unsustainable processes that typically include (and often externalise) misuse of resources, waste, pollution, and ecological destruction. These projects aimed to generate a better understanding of why health threats arise in the way they do, their significance, and possible alternatives. This often helps open and promote possibilities for further work in finding innovative responses for a healthier future with fewer social inequities.

Fighting cutaneous Leishmaniasis in Tunisia. A large outbreak of cutaneous Leishmaniasis appeared in 1982 in the north of the country. The disease then became endemic in 15 of 24 governorates. Research and control strategies were based on conventional, single discipline biomedical top-down approaches and proved ineffective. An ecohealth project began in the Sidi Bouzid Governorate, a hot spot for Leishmaniasis outbreaks. A first funding phase generated new scientific knowledge about risk transmission in residential areas and agricultural fields. The close proximity of domestic animals and the outdoor storing of manure in residential areas provided favourable conditions for the sand-fly vectors, and the accumulation of garbage near homes attracted the rodent reservoirs. Farmers, including children and women, worked their fields when the weather was cool (early morning or night), coinciding with the biting activity of the nocturnal sand-fly vector. Old irrigation methods wasted large volumes of water, adding soil moisture that supported sand-fly reproduction. The team also made significant progress in testing an early warning system based on the monitoring of climate information, disease epidemiology, and changes in vegetation. The increase in rainfall and humidity above normal levels in winter was found to be one of the most significant predictors of epidemic risk the following summer. An ongoing second phase is developing and testing community-led interventions to modify targeted practises for reducing risks of infection and validating the forecasting system. Multi-stakeholder engagement tackling the disease through strategies that also benefit people's livelihoods is helping meet the high expectations that post-revolutionary Tunisian civil society has for their government services. For more details see endnote link²⁷.

Revisiting the effectiveness of avian influenza control measures. Evidence was produced on the limitations of poultry production clusters (PPC) that were forced onto small-scale poultry farmers as a bird flu control measure in SE Asia over the last decade. Although widely applied in the region, this disease control model was

premised on assumptions of reduced risks of disease outbreaks, increased economic gains and a more sustainable form of production – assumptions which had not been rigorously tested and that are not holding up to scrutiny by a multi-country research study involving field research in China, Indonesia, Thailand and Vietnam. Instead of approaching the issue solely through an epidemiological lens, the researchers were strongly informed by a socio-political and historical framing of the issue. This unique approach allowed the researchers to understand the historical development of poultry production clusters in Asia and the ensuing tense relations between poultry farmers and governments. These were found to be central to understanding the PPC research problematic and possible alternatives for improvement. The root causes shaped the research interventions piloted by this project– for example, the researchers invested time and effort to build stronger farmer-State relationships as a means of building strengthened surveillance and disease control systems. They also fostered greater technical oversight and guidance by government authorities and financial support available to smallholder farmers. For more details see narrative in endnote link²⁸.

Tackling neglected disease in more and less affluent countries. These examples concern the control of infectious diseases even where vaccines are available, as witnessed by the recurring outbreaks of Japanese Encephalitis in India and Nepal. These are two highly contrasting settings with a common problem – an inability to control disease transmission in poverty stricken populations. In both projects, researchers were able to identify gaps in current surveillance, prevention and control programs that hinder their utility for guiding interventions and responses to outbreaks that are increasing in frequency. For more details see narrative in endnote link²⁹.

The profound and complex relationship between animals and human health was another important focus of our program. Our body of work in this area is maturing in Africa, Asia and LAC. The funded research has avoided a simplistic view of animals as zoonotic threats towards human populations and is contributing valuable and much-needed nuances to the understanding of this problematique. For instance, the project on Japanese Encephalitis in India cited above is helping to ‘bust myths’ – challenging conventionally held notions of the role of farmed pigs in fueling the transmission of that disease. That same project is also providing evidence of the protective role of cattle against this emerging disease, a little understood phenomenon known as zooprophylaxis. For more details on the Program’s portfolio on animal-human health projects see narrative in endnote link³⁰.

The examples cited above provide evidence on innovative strategies guided by ecohealth research to protect people from EIDs, improve environmental health management to reduce risks from this type of diseases, and raise greater awareness among policy makers on ecological and social dimensions of EIDs. Several examples also depict progress in influencing local policies through the research. See Table 1 on intended program outcomes in Program Prospectus for 2010-15, p. 10.

Filling knowledge gaps in agriculture and health

The program supported research on agriculture and health with an aim to produce knowledge with a transformative intent. Our interest in this area resides in the general observation that research and development for increasing food production seldom target inter-linkages between agriculture, environment and health. Agricultural innovations and interventions do not always exploit opportunities to improve health, and may sometimes inadvertently harm health. Some examples of relevant knowledge produced during this prospectus period are presented below.

Pesticide effects on pregnant women and infant health. Research findings in the Matina County of Costa Rica showed a strong correlation between women's residential distance to banana plantations and levels of the fungicide ETU in their urine. In this region, large-scale banana growers apply more than 2 million kilograms of pesticides annually in 40,000 hectares of land, while small-scale plantain farmers in conditions of extreme poverty have adopted the use of highly toxic pesticides with little understanding of risks or benefits. The concentration of manganese in the hair and blood of pregnant women was found to be significantly higher among women living closer to banana plantations. The study also established the detrimental effects of pesticide and manganese exposure on infant neurodevelopment of women living in houses with permeable walls and unfinished floors that are difficult to clean. Research findings are beginning to prompt engagement of different levels of government and community organizations. For more details see narrative in endnote link³¹.

Improving Pastoralists livelihoods in Africa. Around the Lake Mburo National Park in Uganda, people, livestock and wildlife live in close proximity to one another while using the limited water resources and pastures along the edge of the park and nearby tourist resorts. In 2011, a multidisciplinary team of researchers from Makerere University began to explore environmental, social and economic factors affecting livestock and public health. They found that the people and their livestock living around the park were infected by Brucellosis. Pastoralists were also found to be the most affected group, both in terms of their health and their household income. Due to the disease burden, their herds were smaller than those of villagers. They also owned cattle that produced smaller amounts of milk. This reduced the already limited household income available to families from the sale of dairy products. The team is in the process of securing funding from the Department for International Development in the United Kingdom to continue developing adaptation strategies and education activities to reduce health risks and vulnerabilities among pastoralist communities and to inform pastoral development policy in the country. For more details see page 15 of the [Animal-Human health narrative](#).

New Approaches to Fighting Malaria in Peru. The country's arid North Coast is affected by Malaria due to extensive rice paddy irrigation that allows the malaria mosquito to proliferate unabated. The mosquitos in this region have developed resistance to all pesticides used to by the Ministry of Health to control malaria, prompting authorities to search for alternative means of control. Climate variability and

change is also threatening irrigation water supplies, forcing farmers to seek alternative farming methods. In the Lambayeque Region, by introducing intermittent irrigation techniques allowing rice paddies to dry for selected lengths of time, the project was able to demonstrate to health and agriculture officials, as well as small rice growers (who dominate rice production in the North Coast of Peru) that: changes to irrigation practices cut mosquito populations by 90%; decreased water use by 30 to 60%, decreased the use of agrochemicals by 30% while rice yields increased by 25% with significant economic savings to small rice producers. An ongoing phase of work led by Peru's Ministry of Health is scaling up benefits to the country's North Coast using Jequetepeque Valley in the neighbouring regional jurisdiction of La Libertad as a demonstration site at watershed scale. In March 2014, the regional Government of Lambayeque renewed the legislation on promoting intermittent rice irrigation in Lambayeque for the control of malaria. See narrative in following link³².

The above examples provide evidence of progress in achieving more systematic policy considerations of health and ecology in agricultural research by different levels of government as a result of ecohealth research. The research in Peru's North Coast also provides an illustration of better agricultural approaches and technologies that can effectively improve agricultural productivity, reduce pollution and waste, and improve public health (re Table 1 on intended program outcomes on agriculture and health in Program Prospectus for 2010-15, p. 10).

Climate change and health

One set of projects that was particularly challenging in knowledge production concerns research on climate change, adaptation and health. An external evaluation of this portfolio (January 2014) concluded that project teams had conducted valuable research contributing to systems-based understanding of the topics explored (food and water security). However, there was limited incorporation of climate change and variable incorporation of specific ecohealth approaches in the projects. As a result, short-term policy influence or contributions to adaptation practices were not achieved by most projects. One learning stands out: research on climate change, adaptation and health requires a programmatic approach, beyond the support and oversight of a set of individual projects. This means having not only a robust implementation logic for a thematic set of projects (inputs, outputs, outcomes and linkages between them), but also a program implementation 'theory' that supports and guides what is a difficult scientific area of inquiry (CC and health) in a difficult setting (Sub Saharan Africa). For more details on these assessments see links in endnote³³. The new initiative led by TDR targeting climate-sensitive vector borne diseases in sub-Saharan drylands cited earlier was funded in 2013. This initiative addresses many of the shortcomings experienced earlier.

Peer-reviewed publications

One last element to note in terms of the building of a knowledge base for the field is the tally of peer reviewed publications related to ecohealth research. Since 2010 at least 148 papers have been published from grant recipients and 11 more publications have been accepted and are in press (see [database of publications](#)). Only 9 publications are in non-English or French language journals. Many more publications are in preparation or have been submitted and are in review. Published papers span a wide diversity of journals (85 different journals counted) attesting to the multiple disciplines involved in the research. These include journals of high to low impact factors (e.g. Tropical Animal Health and Production (10), PLOS Neglected Tropical Diseases (4), Ecohealth (3), American Journal of Tropical Medicine and Hygiene (3), PLoS One (3), Acta Tropica (2), Environmental Research (4), Public Health and Nutrition (3), Neurotoxicology (2), and other)³⁴. About 28% of the publications published do not expressly acknowledge funding from IDRC. A number of reasons account for this, including: omission; acknowledgement to parallel, spinoff or subsequent studies funded by others that built on our sponsored work; or publications about our Program (e.g. Webb et al 2010). These publications were sent to us by the authors as outputs of their ecohealth work linked to our Program, and represent a knowledge base for the field that is in the public domain. This level of publications also represents an important achievement given our emphasis in development outcomes (i.e. a significant investment in time required taken away from preparation of academic outputs), the large number of non-English or French speaking teams we support, in addition to the challenges of publishing in a scientific world that remains dominated by disciplinary domains. We believe this level of academic output has increased substantially since our last Program review given our prompting and support as discussed in the first part of the report, but this is the first prospectus period where we specifically track peer-reviewed publications and are unable to make firm comparisons with past levels of output.

2.3 Mainstreaming and institutionalization

Field-building activities in this program period jointly comprise a strategy of gradual mainstreaming and institutionalization of ecohealth principles and of the idea of a broader emerging field. This is work in progress. Our aim has been to support a diversity of leverage points that create opportunities for dissemination and strengthening of relevance, legitimacy, and collective agency in uptake of ecohealth ideas and approaches to research. These include (among others) continued support to leading organizations and researchers with the aim of bringing evidence-based changes to scale (e.g. the focus and investment on vector borne diseases research in Latin America), investing in the development of ecohealth curricula around the world, supporting graduate students and young professionals (field research awards and/or participation in research workshops and projects), supporting the International Association of Ecology and Health and its

regional and global conferences, lobbying for the internationalization of their board to include developing countries, and building collaboration with other donors and multilateral agencies (see section on diversification of partnerships and funding base). For the purposes of this discussion on Program outcomes, we distinguish between mainstreaming and institutionalization, with the first highlighting the spread and acceptance of relevance and worthiness of ecohealth ideas and activities. By institutionalization we mean the incorporation of these into the structure and/or programming of an organization. Both have been met with some success.

Efforts in mainstreaming by grant recipients and partners increased at a global scale much above our expectations (i.e. much more than what could have been directly expected with project funding). Fuelling these efforts is the motivation of a wide diversity of actors in providing spaces for dissemination and some form of permanence and persistence of key ideas on ecohealth into the future. One example is provided by the Canadian community of practice in ecohealth (COPEH Canada) and their linking with continuing education of public health professionals in collaboration with the Public Health Agency of Canada (PHAC)³⁵. A second example is the development of an inter-university PhD program on health and environment for West Africa through the collaboration of the regional community of practice COPE-WCA and the West African Health Organization (WAHO)³⁶. Both of these required significant investments and negotiation with different donors and multilateral organizations by Program grant recipients. The support of young scientists for graduate studies associated with ecohealth is another example. At least 135 Masters and 77 PhD students across the world have received training, sponsorship of thesis work and/or stipends over the last 6 years. An indication of buy-in and commitment by faculty is also seen in the preparation and imparting of 42 course modules or courses in ecohealth in 17 academic institutions around the world. For more details on these and other efforts at a global scale invested in building the next generation of academics and professionals see link in endnote³⁷, as well as the syntheses and links associated with the Field Building Leadership Grants for LAC and SE Asia (discussed in the next section). There are also emerging examples of recognition of the Program's work³⁸ and application of ecohealth thinking to pressing national priorities³⁹ that are occurring with no funding from IDRC.

In terms of evidence in institutionalization of ecohealth principles in organizations and academic institutions, TDR-WHO's creation of their new program on Vectors, Environment and Society is the most striking achievement in this prospectus period⁴⁰. In the world of academia, two PhD programs are also in the process of being launched in Africa and Asia. In Africa, the inter-university PhD program in public health linking environment and health for West and Central Africa (discussed earlier) spans five West African Universities (Université d'Abomey-Calavi in Benin, Université Felix Houphet-Boigny in Côte d'Ivoire, Université Cheick Anta Diop de Dakar in Senegal, Université de

Ouagadougou and Université Aube Nouvelle, a private university in Burkina Faso). In Asia, the Faculty of Science at Mahidol University in Bangkok is now processing applications of MSc and PhD students for its new program in Ecohealth Management⁴¹, which is expected to be approved soon by the Faculty of Graduate Studies and the University Council and be launched in 2014. In LAC, courses in ecohealth principles have become integral components of graduate programs for the Masters of Public Health and the PhD Program on Environmental Health at the National Institute of Public Health (INSP) in Mexico⁴² and the PhD program in Collective Health, Environment and Society at the Universidad Andina Simon Bolivar in Quito, Ecuador⁴³.

2.4 Fostering distributed leadership across the South and North

As noted in the 2010-15 Prospectus (p.8), strong leadership of individuals alone was not deemed sufficient to achieve the goals of field building in this program period. Strong institutional partnerships were thought to be needed, and expected outcomes related to field-building leadership were described in terms of achievements by regional networks or multi-institutional partnerships, whether in establishing a presence or recognition in regional and global debates, contributing to the uptake of research findings by target audiences, influencing policies and practice, or becoming consolidated and self-sustaining (see [Prospectus Table 1](#), p. 10).

Contributions to a stronger field building leadership in the South supported and strengthened voices and influence in the evolution of the field through different forms of collaboration between groups in Asia, Africa, Middle East, and Latin America and the Caribbean. Leadership was seen as something more than the traditional notion of 'leaders' influencing 'followers'. It was understood as a distributed, systems-based, driving force that goes beyond the purview of one or a selected group of individuals, and in pursuit of a collective good⁴⁴. The Program supported diverse forms of collaboration that encouraged dialogue and debate, where no single actor or agent was in control and engaged in building networks and relationships between different organizations within and between countries. Examples include the multi-nodal organization and joint activities of the LAC and Canadian communities of practice, and their success in capacity building and expanding the reach and critical mass of scientists and professionals from government, academia and civil society.⁴⁵

Other examples of distributed leadership that emerged are seen in the diverse multi-institutional agreements and partnerships developed by the Field-Building consortiums in LAC and Southeast Asia. Both are work in progress, with the LAC consortium being able to capitalize on long-term investments in the region on several fronts, including capacity building, environmental health, and vector borne diseases. This consortium adopted the

nodal structure of the ecohealth communities of practice, providing each node momentum and leveraging capacity that surpassed expectations. For instance, the first established node in Colombia (called Ecosalud ETV Colombia) led by the Fundación Santa Fé de Bogotá secured a USD14 Million grant from the national science funding agency Colciencias to establish a research program based on ecohealth for prevention and control of dengue and malaria in Colombia. In its short time of existence it has also been able to develop agreements for training and education with 14 universities and government bodies, and in 2013 obtained the backing of Deans from 25 countrywide universities to include ecohealth approaches and principles in to the curricula of several university schools and departments (medicine, nursing, environmental sciences, masters programs of epidemiology and public health). More recently (Feb 2014) the node lead signed a cooperation agreement with the country's State agency in charge of comprehensive training (SENA) to incorporate ecohealth modules into the training programs of public health officers in Colombia. The new node in Venezuela (July 2013) recently leveraged support from the national science funding agency, *Misión Ciencias* to embed ecosystem principles into prevention and control projects of different universities and provinces on malaria, dengue, Chagas, yellow fever, oncocerciasis and leishmaniasis (project budgets range from USD 200,000 to 500,000). The node lead also succeeded in obtaining the support from Academic Deputy Deans of Venezuelan Universities to integrate the ecohealth approach into the community work programs of undergraduate students in the Faculties of Health Sciences, Agriculture, Social Sciences and Biology. For more details see narrative in endnote link⁴⁶.

The Asia initiative is younger (start up in late 2011) and in a region of relative recent presence by our Program (post 2005). One early achievement is the success of the workshop series on "Global Health True Leaders" training that was recently completed in four countries: Indonesia (Jan. 2014), Thailand (April 2014), Vietnam (April 2014), and China (May 2014). Overall, 92 students and 89 young professionals from 10 countries including Indonesia, Malaysia, Vietnam, Thailand, Philippines, Lao PDR, Cambodia, China, Nepal, and Myanmar participated through a competitive selection process. The workshops were founded on ecohealth principles and provided learning opportunities on global health, leadership skill development, disease ecology, epidemiology and proposal writing. Participants came from a wide range of professions, including graduate and postgraduate students, medical doctors, veterinarians, NGO staff, researchers, managers, and government officer, among others. These workshops were implemented with pooled funds from IDRC and USAID's Emerging Pandemics Threats program. This is an example of bottom-up collaboration instigated and led by grant recipients from both donors, paving the way for more formal future partnerships between all (see link for current synthesis of initiative⁴⁷, and section on Diversifying partnerships and funding base for more details of ongoing exchanges between IDRC and USAID).

In Sub-Saharan Africa, support to field building grants is just underway under the 'EcoHealth Chairs' initiative aims. Two grants were selected through a competitive call launched in September 2013. The first Ecohealth Chair aims to reduce health risks and vulnerabilities to local communities, livestock, wildlife and the environment around the Queen Elizabeth National Park in Southern Uganda and other protected Ecosystems of Central and Eastern Africa. The project is embedded within a regional network of public health and veterinary medical schools in East and Central Africa called 'One Health Central and Eastern Africa' (OHCEA) funded by USAID's Emerging Pandemic Threats Program. The second Ecohealth Chair (proposal still in development) seeks to enhance the capacity of a network of city-based consortiums in West Africa to address health risks from air pollution that are exacerbated by the effects of climate change. The research team involves several members of the West and Central Africa community of practice, and incorporates an interuniversity PhD program, a strong international collaboration with experts from Canada and Europe and a new partnership with a West African GEOHealth Hub funded by NIH and co-led by the University of Ghana and the University of Michigan. For more information see link⁴⁸. These are early stages. The main outcomes achieved to date are the linkages being developed during project design with different sets of actors in scientific communities known to IDRC but that are newcomers to ecohealth (e.g. GEOHealth and USAID's Emerging Pandemic Threats program). This reflects an emphasis in a forward and outward looking approach being adopted by grant recipients from the outset of proposal development. In past prospectus periods, such an approach was more the exception than the rule.

The intent to foster a distributed type of leadership was to allow for emerging patterns of cooperation and partnership between known and new actors, on topics and activities of shared interest within and between countries, sub-regions and regions. Connections with national and international donors and initiatives were encouraged to maximize complementarity and synergy. The examples above provide an indication of progress in this outcome path.

2.5 Contributing to policy and practice

Two core ideas behind Program contributions to the emerging field, are that scientifically strong research be used to: (i) identify and assess possible ways to foster local change; and (ii) provide guidance about potentials and challenges when taking results to scale (e.g. in another community, watershed or country). The program also aimed to support research that engaged decision and policy-making processes at different levels, along a gradient of influence suggested by Lindquist (2001):

- expanding policy capacities at different levels, municipal to national;
- broadening policy horizons (i.e. new ways of thinking about issues and how to tackle them);

- affecting policy regimes (actual changes in policies and/or programs).

At the level of practice, a similar gradient of influence was conceived concerning the sharing of responsibilities between different stakeholders (government and non-government). During proposal development, grant recipients were encouraged to consider in their research design pathways of change that brought in possible linkages of problems and responses to people's livelihoods, their day-to-day farming, business, and/or community activities along the following gradient:

- increased awareness and knowledge of individuals and communities on health and environmental effects of status quo practices;
- broaden vision and horizon of possibilities and capability for change (i.e. exploring new forms of association or collaboration, and new ways of doing things with less threats to health and the environment);
- taking up changes in organizing and building relationships for change that support adoption and sustainability of new practices benefiting local communities beyond the scope of donor support.

Many of the examples in earlier sections included significant contributions to the different types of influence in policy and practice along these gradients. They were cited earlier as examples of the production of transformative knowledge whose purpose was to guide change. In this section we stress specific changes in policy and practice. The Chagas and Liver fluke cases, for instance, illustrate a progression from broadening the scope of control activities to incorporating changes into vector control policies and programs. This implied changes in knowledge, attitudes and practices of vector control personnel, from policy officials to program managers and field staff in "how to do the new type of work" on the ground. It also implied changes in awareness, knowledge and behaviours of community actors (from school children to local officials), as they engaged themselves as active actors in planning and implementing local interventions. In the case of Chagas disease in Central America, changes in the knowledge and practices of several other sponsors are also manifest as they took on the model interventions and began to use them through their own funding. This process of scaling up is in gestation for the case of liver fluke control in Southeast Asia, and is being spearheaded by actors beyond our funding or influence. The case on soil improvement and child nutrition in Malawi illustrates a situation of swimming against the current of national policies, and on first achieving success at the practice influence level, to then leverage this progress in their continued quest to broaden policy horizons to hopefully prompt changes in current policy regimes that have proven ineffective in improving food security and nutrition. The case discussed earlier on poultry production clusters in Southeast Asia is bringing together national and community governments with small poultry producers to discuss together how to improve a widespread regional control policy that has been poorly designed and implemented.

This dialogue, coupled with parallel explorations of better practices are the priming steps in processes of change.

There are several other examples of influence occurring in projects that were active in this prospectus period. For instance, the Eco-Bio-Social work by TDR-WHO on dengue in LAC recently secured the backing of the Brazilian Head of the Vector Control Program to replicate model interventions in prevention and control in two cities (Goianias and Belo Horizonte) targeting 30,000 households per city. The uptake of these model interventions was motivated by research results from an ecohealth project in Fortaleza, Brazil demonstrating significant reduction of mosquito vector densities compared to the routine programs, with no utilization of insecticides and targeting elimination of mosquito breeding sites by identifying and removing key water containers, and cleaning of backyard areas. Similar discussions have been launched with the Head of the Vector Control Program in Mexico and the Deputy Minister of Health Promotion and Prevention in Colombia. For more details see narrative of initiative in endnote link⁴⁹.

2.6 Diversifying partnerships and funding base

The purpose here has been to help build different forms of regional and cross-regional partnerships and foster diversification of the funding base part of IDRC's strategy for fostering sustainability of the field. The Ecohealth program actively sought out partners, prompting, brokering and support new relationships. Several competitions and other projects targeted multi-country and/or multi-organizational forms of collaboration with the specific intent that "repeat" grant recipients bring in newcomers. This had the dual purpose of expanding the field while providing mentoring on working through the challenges of ecohealth research.

As noted earlier, the Field Building Leadership Grants for LAC and Asia leveraged significant parallel funding and in-kind contributions for their work. These are not isolated cases (e.g. COPEH Canada and the Public Health Agency of Canada, Malawi and the support from the Canadian Department of Foreign Affairs, Trade and Development), although the LAC consortium seems to be by far the most successful in leveraging additional resources. IDRC's investments have helped internationalize the emerging field and strengthen research organizations in Canada and in developing regions. One challenge is the natural tendency for collaboration and leveraging of investments by grant recipients to be oriented to specific geographic locations and topics. This is where the multi-nodal structures of many initiatives became important. Funding of linkages between sub-regions and regions to provide a global dimension and maximize complementarity and synergies for the field remains a critical function that the Ecohealth Program was playing up to now, and for which we have had more difficulties in tackling and expanding.

In response to this challenge, efforts are ongoing to strengthen connections and engagement of the field with several international health and environmental agendas that are compatible with the Centre's approach. For example, discussions on ways of collaboration are taking place with NIH's GEOHealth Hub Program on Environmental and Occupational Health (see exchanges and MOU between organizations)⁵⁰, and with the Canadian Institutes of Health Research's (CIHR) new Environment and Health Signature Initiative (see link⁵¹), as well as with the One Health movement through USAID's Emerging Pandemic Threats Program⁵², the Ecohealth Alliance and its focus on ecological approaches to zoonotic diseases (Loh et al. 2012) among others. The outcomes on these are emerging.

3. Lessons Learned

Our work in earlier prospectus periods was primarily concerned with a particular style of research (an approach) guided by ecohealth principles. Along the way it became apparent that to be successful in reaching program goals, our strategic focus and scope needed to be conceived more broadly, certainly well-beyond the confines of a particular research style or methodology. Investments thus shifted toward increasing support to networking and finally toward field-building. In the course of this evolution, important progress was made and many lessons were learned from opportunities, successes and challenges.

3.1 Achievements during prospectus period

Two fundamental premises guided our Program's logic: (i) ecohealth research can contribute to transformative, evidence-based changes in policy and practice that lead to better health and environmental sustainability; and (ii) Southern leadership in the field of ecohealth is needed to ensure relevant and effective participation of Southern scientists in regional and global development debates, agendas and policies that affect their countries. Achievements highlighted in preceding sections seem to confirm the soundness of both. Past and current experiences illustrate how ecohealth approaches can inform prevention and control of disease and promotion of health in poor populations with less harm to the environment (e.g. less dependence and use of pesticides and other agrochemicals, less pollution, and less waste). Greater buy-in is apparent from scientists and professionals across the world on ecohealth principles, as well as higher interest in collaboration and partnership-building. There also seems to be increasing attentiveness by policy makers and other donors. This is an indication of validity in the overall Program's logic of investments and outcomes sought. Our internal assessment of achievements indicates that:

- There is a growing field of research, education and practice addressing health and environmental issues arising from the interaction of societies and ecosystems, associated with the label "ecohealth".

- The emerging leadership in this field is self-aware and much stronger than it was in 2010, particularly in LAC, SE Asia, India and several institutions in Africa.
- IDRC's role in field-building is today better understood (by us and others) and increasingly recognized by grant recipients, their peers and other funders.
- The Program and close partners are contributing insights in the tasks of field-building more generally (e.g. joint and independent publications).
- Ecohealth (ecosystem approach to health), as a research paradigm, conceptual framework and approach, works; the proof is seen in the impacts, the examples of uptake and institutionalization in policy and in academia, and the attention and prompts for collaboration by much larger donors (e.g. USAID, NIH, CIHR).
- Ecohealth does contribute to a better understanding of EIDs and how to reduce vulnerability of poor populations, increase resilience, and improve sustainability of control measures.
- Ecohealth is a useful approach to bridge traditional agricultural development, health and environmental considerations for improving public health and sustainability.
- Ecohealth remains hard to do, and achieving high-level impacts required sustained efforts, but more people around the world are now much better at doing it, and are deliberately including others and showing them how to do it.

3.2 Evolving concepts in ecohealth

The move from characterizing ecohealth by the three pillars (transdisciplinary research, participation and gender equity) to making explicit the six principles (i.e. added emphasis on systems thinking, knowledge to action and sustainability) was more profound than anyone realized. It shifted for many the style of research farther away from an academic exercise. It also shifted in similar ways our own influence in field building, prioritizing evidence-informed ecohealth practice over a field of applied research.

This journey is helping us understand that successful contributions to the goals of ecohealth depend to a large extent in improving both, the scientific knowledge produced and a more systematic thinking and strategies about its application to different settings and for different intended social outcomes. In other words, neither a standardized set of steps nor a tried-and-true method can successfully be applied without carefully considering the social-ecological setting in which it seeks to make an impact. This shift from scientific knowledge for behaviour change to more robust, action-based knowledge adjusted to real-life settings in prompting and guiding change in policy and practice is difficult and remains work in progress.

Despite evidence of achievements as portrayed in the various examples cited in the outcomes section, certain challenges exist in carrying these lessons forward given the development and academic contexts that continue to be largely defined by single specialized niches of work bounded by single disciplinary approaches, topics and/or sectors. Yet, while the context of international development funding becomes more

volatile, the need for more opportunities for transdisciplinary research increases. Our experiences at the program level help bring to light an important tension (and often a contradiction) between the need to address the complexity of problems and the need to show measurable impacts in the short-term. Still, many experiences have now been shared among groups of researchers, policy makers, communities, and other key actors— the precedents created and the strong relationships born out of these experiences may continue to bear fruit beyond the life of our Program.

This lesson has implications for what research excellence means, and this will certainly continue to be debated into the future. Along with generating new knowledge and techniques through pragmatic research, we are now challenged to pursue innovation at the level of knowledge management that targets collective benefits, for example, by tracking learning, scaling up, and strengthening the implementation capacity of multi-disciplinary teams to respond to fast-paced change. Furthermore, results so far suggest that a stronger economic emphasis is needed to strengthen eco-bio-social analyses and trade-offs between different short to longer-term scenarios if we are to take greater account of political and economic drivers of poverty, ecosystem sustainability, and health.

3.3 Sustainability and collective effort

As noted by Green (2009), a field is more than a discipline, profession, or subject matter. It is also more than the sum of the separate actions by those who identify with the field. Field building is by necessity a multi-stakeholder endeavour requiring engagement from diverse actors with different roles and contributions. IDRC's mandate provided a space and contributed legitimacy in brokering relationships in many parts of the world between different types of academics, professionals, organizations and policy communities in health, environment and social development, among others. This gave momentum to field emergence but by no means ensured sustainability. One programming bet was in promoting and disseminating jointly with others the key ideas of ecohealth, accompanied by encouragement and amplification of conversations about the emerging field.

When we first began back in 1996 in our role of single donor in ecohealth research it would have been impossible to conceive the level of activity and growth of the field today. The increasing interest and buy-in by development and scientific communities, grant recipients, partners and associates in policy and development spheres indicate a good likelihood of sustainability of ecohealth principles and of new ways in doing applied research on health and environment. The partnerships developed between several groups around the world will likely continue in different forms for years to come. Yet, our capacity to increase our level of effort is limited by our own mandate and resources. In one way, the sustainability of the field means widening the number of, and interactions between, scientific actors, donors, government and civil society participants in general; in another way, it can be difficult to sustain a field that continues to expand beyond any one

insular approach. We have learned to work with others along a gradient over the years, from the local level all the way to inter-regional collaborations. This has allowed appropriate versions of ecohealth to emerge at different inter-sector junctures and scales relevant to different needs (i.e. that target different social and ecological outcomes). Expanding collective capacities will require continued investments and forging of new partnerships. Needed tasks ahead are not new (see Charron 2012). These include continued efforts in developing stronger evidence and a wider knowledge base, expanding the peer community, attracting a wider diversity of funders (national and multilateral agencies, private and public funds), systematizing results and taking the application of ecohealth principles to scale in both policy and practice. It is a collective effort in which IDRC's contribution can only be one among many.

One particular challenge ahead for the emerging field is addressing the predicament of early career scientists and professionals trained in ecohealth for whom success is in part defined by getting a job that is fulfilling and in line with their acquired vision of science and development, career expectations, and ability to develop a practice that goes beyond conventional disciplinary and specialized academic or policy approaches to change. Young scientists now find themselves caught between the lure of a promising and growing scientific field and the need to find their way or develop their career in institutional settings that remain largely structured and function according to previous paradigms and disciplinary silos. The emerging field is succeeding in attracting young bright minds, but it has yet to develop a strategy of support that amplifies their potential in tackling the social-ecological challenges that older generations are leaving behind due to omission, neglect or denial (not lack of knowledge). Outside of IDRC, several international funders are exploring ways to support the professional insertion of young researchers in Southern academic and research institutions. Over time, it will be important to facilitate strengthening these institutions to allow new generations of scientists find fulfilling jobs in their own countries, contributing to building knowledge that enhances resilience.

3.4 Way Forward

IDRC's funding in health, environment and agriculture is set to continue into the future and good possibilities exist for past Program investments and old and new partnerships to find ways in pursuing an evolving scope of work needed to address the multiple and complex burdens of health threats that the world now faces (infectious emerging and re-emerging diseases, non-communicable diseases and ill health, climate and global environmental threats). The one task that remains before us is finding effective ways of globally articulating collaboration and shared leadership in the growing ecohealth field, as this has been a key catalytic and brokering function we have played to date. Defining our new role in and with the ecohealth community is a task we are engaged in as we transition into new programming.

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Endnotes

¹ [External Review of the IDRC Ecohealth Program Initiative](#) (2008)

² [Ecohealth Forum 2008](#); [EcoHealth2010 Conference](#); [Ecohealth Conference 2012](#) ; [Ecohealth Conference 2014](#)

³In addition to Charon (2012) cited earlier, other contributions include publications (e.g. [Ecosystem Approaches to Health for a Global Sustainability Agenda EcoHealth](#), September 2012, Volume 9, Issue 3, pp 256-266 By Dominique Charron; EcoHealth and EIDs - Dynamics between environmental change, development, and EIDs in Asia in open access journal '[Infectious Diseases of Poverty](#)'), editorials and OP-eds (e.g. "[Let's stop this influenza outbreak before it becomes a pandemic](#)" in the Globe and Mail, 14 May 2013; "[Struggle to explain bird flu's spread to humans](#)" in SciDev.net, 20 Sept 2013), as well as other publications cited in the main text.

⁴ [106692](#) Ecohealth and Communicable Diseases in Latin America: Improving technical writing skills of young researchers; [104270](#) Health, Water and Climate Change Synthesis of findings and Writeshop; and [105151](#) COPEH-LAC (Phase II) Dissemination and Institutionalization for Research, Outreach and Policy Influence.

⁵ For description of project see [107341](#) Improving Knowledge Management and Utilization of Research Results in Ecohealth Projects.

⁶ [COPEH LAC External Evaluation](#); [CC-Health external evaluation](#); [EcoEID external evaluation](#); [EcoEID first interim progress report](#)

⁷ [Ecohealth Research Excellence Concept Brief \(draft Oct 2013\)](#); [Montreal EcoHealth 2014 Panel Submission - Research Excellence](#)

⁸ A framework for tracking Program Level Outcome Tracking (PLOT) - [PLOTs Framework – PLOT template](#)

⁹ [106732 Developmental Evaluation of Ecohealth Field-Building](#) (Sept. 2011); and [Revised terms of reference](#)

¹⁰ Main projects in the Middle East during this prospectus period consisted in a research grant in Tunisia funded through the EcoEID project ([PAD 105509-44](#)) and the creation of a research network on agriculture and health as part of a broader regional project jointly developed and funded with other Centre Programs (Governance for Equity in Health Systems, and Non-Communicable Disease Prevention). The aim of the broader project is to strengthen public health research, teaching and practice in the Arab world (see project [PAD 106981](#))

¹¹ Program investments in this category “Other Field Building Leadership Activities” include: associated funding of consultation processes that preceded Field Building Leadership Grants, funding of regional and global conference that allowed Southern partners to present their work and share experiences, regional networking components of projects, and support to the communities of practice in their role of expanding and strengthening the field.

¹² Networked projects refers to groups of research organizations from different countries that work jointly on a same topic, but with one or two IDRC grant recipients providing sub-grants to the others. In this scenario, the grant lead organizations of a cohort of projects were often ‘repeat recipients’ that guided new participating organizations.

¹³ [107345 PAD](#) Ecohealth Chair in Uganda and [107347](#) Project identification Memorandum, Air Pollution in West Africa

¹⁴ [106149](#) PAD Ecohealth Field building Leadership in Control and Prevention of Vector Borne Diseases in LAC

¹⁵ [107345 PAD](#) Ecohealth Chair in Uganda

¹⁶ [107347](#) Chair Pollution de l’Air

¹⁷ [106905](#) Population Health Vulnerabilities to Vector-Borne Diseases: Increasing Resilience Under Climate Change Conditions in Africa (project approval document); and [first technical report](#)

¹⁸ [106914](#) Climate change, vulnerability and health in Colombia and Bolivia

¹⁹ [107337](#) Regional Consultation on Agriculture and Health Research for Sustainable Development; and [107700](#) Sustainable Livestock Production, Health and Environment in the Bolivian Altiplano

²⁰ [107344](#) Promoting Health, Livelihoods, and Sustainable Livestock Systems in Peri-Urban Ecosystems of India

²¹ [Ecohealth 2014 Conference](#), 5th Biennial Conference of the International Association for Ecology and Health

²² [Chagas disease prevention](#) in Central America synthesis narrative

²³ [Soil health and child nutrition in Malawi](#) synthesis narrative

²⁴ [Reigning in the disease burden of liver fluke in Thailand](#) synthesis narrative

²⁵ [Animal and Human Health](#) activities synthesis narrative

²⁶ [Rabies surveillance and control in Bali](#) synthesis narrative

²⁷ [Fighting cutaneous Leishmaniasis in Tunisia](#) synthesis narrative

²⁸ [Poultry production clusters project](#) synthesis narrative

²⁹ [Japanese Encephalitis in India and Nepal](#) synthesis narrative

³⁰ [Animal-Human Health project portfolio](#) synthesis narrative

³¹ [Women and infant health Costa Rica](#) synthesis narrative

³² [New approaches to fighting Malaria in Peru](#) synthesis narrative

³³ [Project completion report](#) for climate change, water management, and health risks in West and North Africa; and [External evaluation report on climate change and health](#) portfolio

³⁴ Numbers in parentheses refer to published peer-reviewed paper that acknowledge IDRC’s funding.

³⁵ COPEH-Canada and Public Health Agency of Canada collaboration: [Linking public health, ecosystems and equity through ecohealth training and capacity building: Ecohealth Training and Awards Program May-June 2014](#) Summer Workshop and Field School

³⁶ [Inter-University PhD program in West Africa](#) synthesis narrative

³⁷ [Capacity Building in Ecohealth program](#) synthesis narrative

³⁸ In his recently released book "Aid on the Edge of Chaos: Rethinking International Cooperation in a Complex World" (<http://ukcatalogue.oup.com/product/9780199578023.do>), Ben Ramalingam devotes two paragraphs to discussing ECOHEALTH as an exemplary, cutting-edge approach to incorporating complex adaptive systems thinking into aid. (As noted by the review in the Economist, below).
 "An exhaustive tour of the complex systems research landscape, including how it is used to understand phenomena as diverse as climate change, food price rises, ethnic segregation and the Arab spring ... Important and relevant for the aid world." - Amy Kazmin, Financial Times
 "The most interesting part of Mr Ramalingam's book is his discussion of how some agencies are beginning to learn from the way poor people can successfully do difficult things... [and that] experimenting repeatedly and quickly has much to offer the world of aid." - The Economist

³⁹ See Program Level Outcome Tracking entry for [Peru's Ministry of Health prevention and control program on dengue](#) (DIGESA); And [follow up publication by PAHO](#)

⁴⁰ See TDR's Vectors, environment and society research program, <http://www.who.int/tdr/research/vectors/en/>; and short descriptions on funded multi-country projects:
http://www.who.int/tdr/research/vectors/community_based_interventions/ecohealth/en/;
<http://www.who.int/tdr/news/2011/dengue-control/en/>
[TDR Eco-Bio-Social Approach](#) to Chagas disease and Dengue in Latin America and the Caribbean project (TDR-EBS LAC #104951) synthesis narrative

⁴¹ MSc and PhD new [program in Ecohealth Management](#), Mahidol University

⁴² [PhD Program on Environmental Health](#) the National Institute of Public Health (INSP) in Mexico

⁴³ [PhD program in Collective Health, Environment and Society](#) at the Universidad Andina Simon Bolivar in Quito, Ecuador

⁴⁴ This is in agreement with the work of Guy Naysmyth (2012) via exchanges with Bob Williams, 30 April 2012, unpublished.

⁴⁵ See project completion reports for: [104277](#) Canadian Community of Practice in Ecohealth: Training and Awards Program for Research in International and Development Settings; and [105151](#) COPEH-LAC Dissemination and Institutionalization for Research, Outreach and Policy Influence

⁴⁶ Ecohealth [Field Building Initiative in LAC](#) synthesis narrative

⁴⁷ Field Building Leadership Initiative: [Advancing Ecohealth in Southeast Asia](#) (106556) synthesis narrative

⁴⁸ Building the field of Ecohealth in Sub-Saharan Africa: the '[Ecohealth Chair](#)' Initiative

⁴⁹ [Dengue Eco-Bio-Social Approach](#) in Latin America and the Caribbean

⁵⁰ See synthesis briefs draft MOU between IDRC and FIC-NIH GEOHealth: [Draft 5 May Global Partnerships on Health and Environment, IDRC-FIC MOU FINAL](#)

⁵¹ See communication exchanges between IDRC and CIHR on Environment and Health collaboration:
 Forging [Partnerships on Global Health & Environment between IDRC & CIHR](#) - Short Brief, 13 May 2014

⁵² Personal communications with John Deen([link](#)), Professor and Senior University Liaison USAID/Respond, College of Veterinary Medicine, University of Minnesota; and with Rob Henry rhenry@usaid.gov and Dennis Carroll DCarroll@usaid.gov of USAID's Pandemic Threats Program ([link](#))