biosciences eastern and central africa

ILRI
INTERNATIONAL LIVESTOCK RESEARCH INSTITUTE

THE BECA-ILRI HUB AFRICA BIOSCIENCES CHALLENGE FUND (ABCF)

CAPACITY BUILDING EVALUATION

FINAL REPORT

APRIL 2014

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Acknowledgements

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We hope the findings and recommendations in this report will prove useful in articulating the performance and impact of the ABCF program and capacity building activities of the BecA-ILRI Hub to date, as well as informing its development going forwards as a center of excellence for biosciences research and training within the region.

Angela R. Hansen, Partner and Director, Agriculture & Food Security Practice
Dalberg Global Development Advisors, April 2014

Abbreviations

ABCF	Africa Biosciences Challenge Fund
AECF	Africa Enterprise Challenge Fund
AR4D	Agricultural Research for Development
ASARECA	Association for Strengthening Agricultural Research in Eastern and Central Africa
ASTI	Agricultural Science and Technology Indicators
AU/NEPAD	Africa Union's The New Partnership for Africa's Development
AusAID	Australian Aid
AWARD	African Women in Agricultural Research and Development
BecA	Biosciences eastern and central Africa
BMGF	Bill and Melinda Gates Foundation
c.	Circa i.e., approximately
CG	Consultative Group
CGIAR	Consultative Group on International Agricultural Research
CIMMYT	International Maize and Wheat Improvement Center
CSIRO	Commonwealth Scientific and Industrial Research Organization
DFAT	Department of Foreign Affairs and Trade (Australia)
FTE	Full-time equivalent (researcher or employee)
ICT	Information and Communications Technology
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
IFS	International Foundation for Science
ILRI	International Livestock Research Institute
KPI	Key Performance Indicators
NARIs	National Agricultural Research Institutes
NARS	National Agricultural Research System
SIDA	The Swedish International Development Cooperation Agency
SFSA	Syngenta Foundation for Sustainable Agriculture
UNESCO	United Nations Educational, Scientific, and Cultural Organization

Definitions

Individual capacity building	Activities supported by the ABCF aimed at improving the agricultural biosciences skills of individual researchers and scientists i.e., ABCF fellowship and annual workshops/training seminars
Institutional capacity building	Activities supported by the ABCF aimed at building the agricultural biosciences capacity at NARS institutes i.e., technical advisory support (e.g., lab design), partnerships to advocate for food security issues, providing connections to networks and key influencers
Less-resourced NARS	NARS constrained by low quality of scientists and technicians (e.g., very few PhD level staff), weak partnerships between NARIs and universities, and limited access to quality research facilities. Some of the countries with less-resourced NARS have a history of political instability e.g. South Sudan
Strong NARS	NARS with highly trained scientists engaged in quality research and that have access to quality research facilities
Stakeholders	All BecA-ILRI Hub affiliates who provided insight for this report i.e., BecA-ILRI Hub staff and extended faculty, ABCF donors and funders, ABCF fellows, workshop participants, and AR4D institutions

Executive Summary

The ABCF program was launched in 2010 by the BecA-ILRI Hub and CSIRO to help address research and biosciences capacity gaps that exist within the region through the provision of world-class facilities, sponsored training programs and capacity building of National Agricultural Research Systems (NARS). The ABCF has achieved significant growth and impact reaching c. 500 individual researchers and scientists across the region over the past three years.

At this critical juncture in its development, Dalberg Global Development Advisors was brought on board to evaluate the performance and impact of the ABCF Program to date, in order to provide accountability to key stakeholders and to inform the development of the program going forward.

In undertaking this evaluation we sought direct feedback from over 250 ABCF stakeholders including current and alumni ABCF fellows, workshop participants, NARS institutions, the BecA-ILRI Hub donors supporting the ABCF and other capacity building activities, the BecA-ILRI Hub management, operational staff, researchers, and the BecA-ILRI Hub extended faculty. We complemented this with desktop review of the BecA-ILRI Hub documents including the *BecA-ILRI Hub Business Plan 2013-2018*.

Our findings were very positive and point to the significant reach and impact the ABCF program has achieved in a short timeframe. Over 90% of stakeholders stated that the BecA-ILRI Hub promotes access to world-class research and training facilities, builds the biosciences capacity of individuals and institutions, and promotes African scientists to lead and sustain biosciences research in Africa. In addition, when compared to other AR4D programs in the region across several metrics (such as commitment to mission, provision of world class facilities, etc.), over 90% of all survey respondents gave the ABCF an average score of 4.2 out of 5[1].

It is impressive to note that between 2010 and 2013, the ABCF has achieved a year-on-year growth of 56% in the number of researchers and scientists reached through its fellowships and 70% year-on-year growth in workshop participants. In terms of the geographic reach of the BecA-ILRI Hub's activities, there has been a concentration in East Africa with 56% of fellows and workshop participants originating from Kenya, Ethiopia, Uganda, and Tanzania. There has been significantly less reach and impact in Central and West Africa, which is unsurprising given that the BecA-ILRI was initially set up to build biosciences capacity in eastern and central Africa. Similarly, there is limited reach in French speaking countries (in part given the English-speaking requirement of the program, enforced due to the near-universal requirement that peer-reviewed scientific writing are in English). From a gender diversity perspective, it is encouraging that the ABCF program has achieved 33% female representation with the fellowships and 43% through its annual workshops, exceeding its 30% minimum but falling short of the 50% target consistent with ILRI gender mainstreaming strategy.

In terms of its capacity building activities with NARS, we see significant diversity in the level of support and engagement provided by the BecA-ILRI Hub. Whilst 74 NARS in Africa have received support through research fellowships, some have also received support to secure funding, advocacy and technical advisory support from the BecA-ILRI Hub[2]. Where provided, this support has been highly valuable in driving

[1] Based on a scale of 1 – 5 where 1 = "very poor" and 5 = "excellent"

[2] There was insufficient data available to assess the exact number of NARS that are receiving these broader support services from the BecA-ILRI Hub today.

institutional growth and development. Extending these forms of advisory support to a broader set of NARS is an opportunity area for further exploration, particularly since 61% of surveyed research institutions

highlighted these as areas they would be keen to have the BecA-ILRI Hub's support. It is also worth noting that the BecA-ILRI Hub currently achieves greater engagement and impact with "strong" NARS relative to "less-resourced" NARS in the region[3], with 82% of all ABCF fellowships being awarded to scientists in countries with strong NARS. This warrants further focus and investigation to ensure the appropriate balance is being achieved.

In order to further diversify its reach to individual scientists and NARS, the BecA-ILRI Hub has formed strategic partnerships with other capacity building programs in the region such as AWARD, ASARECA, IFC, and UNESCO. Through these partnerships, 37 scientists have been supported between 2011 and 2013 (six women scientists as ABCF fellows through AWARD, 11 ABCF fellows from less-resourced NARS through ASARECA, and 20 women scientists as workshop participants through UNESCO).

From an overall quality and performance perspective it is very positive that the fellowships and workshops were rated as *"good"* or *"excellent"* by over 93% of participants. In particular the lab facilities, training seminars, and access to research staff stood out with exceptionally strong performance (over 90% of fellows rating these as *"good"* or *"excellent"*). This endorsement of the complete ABCF service offering was further validated by home institutions; in addition to fellowships and workshops, over 50% of those surveyed ranked support in securing funding and access to networks as the most beneficial attributes of their engagement with the BecA-ILRI Hub.

Across all survey respondents and interview participants, it was noted that for ABCF (and the BecA-ILRI Hub in general) to maximize its impact, it will be important to increase the number of fellowships and increase its efforts in connecting home institutions with key donors/funders, as well as specific Hub support on funding proposals.

A critical question for this evaluation was to assess the impact that the BecA-ILRI Hub is having on increasing the capacity of individuals and institutions to undertake biosciences research to address the core challenges facing agriculture and food security in the region. To that end, ABCF has shown strong performance in building capacity of individual researchers across different measures: more than 90% of all fellows have either improved upon or gained new scientific skills and 80% have either received scholarships or secured funding and/or grant to support their research. Furthermore, survey results suggest that the ABCF is enabling downstream impacts. Approximately 60% of alumni fellows stated that their ABCF-sponsored research has led to new techniques being implemented in the field and over one-third stated that their research has informed public policy and/or resulted in the introduction of a marketable product in their field of research. From a NARS perspective we see strong knowledge transfer with ABCF beneficiaries conducting training workshops at their home institutions, driving changes in the curriculum and encouraging other researchers to apply to the ABCF. Lastly, institutions have placed high value on the networks and influences they have developed through the BecA-ILRI Hub; over 80% have indicated they have developed valuable contacts with other NARS, private sector actors, and donors.

[3] Strong and less-resourced NARS as classified by ASARECA based on factors such as (1) availability of highly qualified researchers (2) quality and accessibility of research facilities (3) political stability of the country etc.

There was very positive feedback from stakeholders on the leadership and management of the ABCF and the quality of the research assistants and supervising scientists. However there is a concern regarding the operational sustainability of the BecA-ILRI Hub given the significant dependency on three individuals[4] for management and leadership, as well as the ability to attract and retain high quality staff researchers and scientists (given their trade-offs between progressing their own research versus mentorship of fellows). Lastly the overall operational capacity may prove insufficient in the context of the ABCF growth outlined in the business plan.

Financial sustainability remains a core challenge for the ABCF particularly in the context of scale up and growth. There is a desire to move to a mixed income model which provides greater emphasis on income generating services through hosting fee-paying externally funded researchers and programs at the BecA-ILRI Hub (however this currently only represents <16% of total income generated[5]). Achieving this increase will be important in building financial sustainability along with the need to attract a larger base and mix of donors, including from African based organizations and programs.

The central challenge for the BecA-ILRI Hub and ABCF in its next phase of evolution is to achieve increased scale, reach and impact while also maintaining the high quality delivery and performance it has achieved to date. Alongside this, it is also important for the BecA-ILRI Hub to address the targeted performance issues and gaps highlighted in this report. We have outlined a series of recommendations and areas for further consideration for the ABCF and the BecA-ILRI Hub's future growth and development. These are categorized into short-term immediate actions, areas for further exploration, and longer-term strategic considerations.

1. The BecA-ILRI Hub and ABCF background

Biosciences eastern and central Africa, hosted by the International Livestock Research Institute Hub (henceforth referred to as *"the BecA-ILRI Hub"*) was co-founded in 2002 by the African Union's New Partnership for Africa's Development (AU/NEPAD) and ILRI, with substantial initial support from the Government of Canada. The BecA-ILRI Hub was established as a research platform to enable African scientists to address key agricultural challenges through the applications of modern biotechnology. In 2010, the BecA-ILRI Hub and CSIRO jointly launched the African Bioscience Challenge Fund (ABCF) program to help address research and biosciences capacity gaps that exist within the region through the provision of world class facilities, sponsored training programs, and capacity building of NARIs. The ABCF program, based in Nairobi, Kenya, is hosted by the BecA-ILRI Hub and is donor funded by DFAT, SIDA, BMGF, UNESCO, and SFSA. The vision of the ABCF program is to "contribute towards improving the livelihoods of millions of resource poor people in Africa, through the use of bioscience-based technologies to improve agricultural productivity, increase incomes and improve food and nutritional security." The ABCF program comprises the vast majority of the BecA-ILRI Hub external capacity building but does not include the hosting of directly-funded researchers or ad hoc workshops. This will be further examined in Section 3.

The ABCF program seeks to fulfill its vision and mission to mobilize AR4D bioscience for Africa's development through the following objectives: (1) Promoting access to world-class research and training facilities at the BecA–ILRI Hub (2) Building the capacity of individuals and institutions to harness the latest biosciences technologies to improve agriculture in Africa (3) Supporting African scientists' efforts to lead and sustain biosciences research in Africa. To date, the objectives of the BecA-ILRI Hub are being achieved through

[4] The BecA-ILRI Hub director, Capacity building team leader, and Capacity Building Program Officer

[5] Calculated based on the 2013 figures provided in the BecA-ILRI Hub business plan 2013-2018.

various capacity building activities that include **sponsored fellowships and workshops**, **four institutionalized annual workshops and additional ad hoc training courses**, and **tailored services for institutional capacity building** of NARS institutions across the region (e.g., lab design, support for proposal writing, connections with suppliers of lab reagents and equipment etc.)

The program operates in the critically important intersection between agricultural research and development, food security, and individual and institutional capacity building. AR4D innovations cover a wide variety of subject matter that has the potential to affect millions of individuals and the development trajectory of nations. Given the high startup and fixed costs, African institutions have only recently begun to invest, build, maintain, and leverage world-class facilities and associated intellectual capital. The BecA-ILRI Hub is positioned as an African center of excellence to address this need.

The ABCF Program has achieved significant growth and impact over the past four years, reaching c.500 individual researchers across the region. At this critical juncture in its development, Dalberg Global Development Advisors has been bought on board to evaluate the performance and impact of the ABCF Program to date.

2. Evaluation objectives and methodology

The evaluation is designed to identify opportunities to improve and enhance the ABCF Program, as well as to provide important accountability to the BecA-ILRI Hub and the contributing donors on the performance and impacts of the ABCF Program and Hub on individual and institutional capacity building within the region.

The objectives of the evaluation were:

- To map the reach and scope of the BecA-ILRI Hub's capacity building activities since the inception of the ABCF programme,
- To assess the performance of the ABCF against a range of performance criteria,
- To determine the impact of the ABCF for individual fellows and workshop participants, for the institutions where they work and others that have benefitted from the BecA-ILRI Hub's reach,
- To offer a perspective on the BecA-ILRI Hub's strategy and strengths/capabilities, in light of anticipated sector trends and the insights from the research and stakeholder engagement.

The findings and key outputs from the evaluation are summarized in this report. The primary audience for this evaluation is the management of the BecA-ILRI Hub and the contributing ABCF donors, as well as broader stakeholders of interest within the region.

Scope of evaluation

As earlier indicated, the BecA-ILRI Hub provides a research platform to enable African scientists to address key agricultural challenges through the applications of modern biotechnology. This includes a focus on attracting external researchers to utilize the BecA-ILRI Hub's resources, as well as developing its own internal research capabilities by employing researchers and scientists who conduct their own research at the BecA-ILRI Hub. The ABCF program focuses solely on external capacity building activities, which include the ABCF fellowship, the BecA-ILRI Hub training seminars and workshops, and institutional capacity building with national research institutes. For the purposes of this evaluation, we will focus on these capacity building activities that fall under the mandate of the ABCF.

Evaluation Methodology

Dalberg employed a hypothesis-driven approach to the evaluation, and placed a strong emphasis on collecting primary feedback from the following key stakeholders:

- ***Current fellows*** *– fellows actively participating in the ABCF fully sponsored program in 2014*
- ***Alumni fellows*** *– all fellows who have graduated from the ABCF program since its inception in 2010, to date*
- ***Workshop participants*** *– all researchers and scientists who have attended one of the four annual training workshops held by ABCF*[6]
- ***Externally funded researchers*** *– these are researchers and/or scientists who pay to use the BecA-ILRI Hub facilities to conduct their research*
- ***The BecA-ILRI Hub staff and extended faculty*** *– this group includes both research and non-research staff and management who are central to the running of the BecA-ILRI Hub and to executing ABCF's capacity building activities*
- **NARS institutions –** includes both of the following:
    - ***Home institutions*** *–the universities or National Agricultural Research Institutes in which the fellows and participants normally conduct research, and with whom the BecA-ILRI Hub provides with institutional capacity building.*
    - ***Other NARS institutions*** *– the universities or National Agricultural Research Institutes with whom the BecA-ILRI Hub works on institutional capacity building activities and advocacy with.*
- ***Institutional investors*** *– these are donors (e.g., BMGF, SIDA) and collaborating institutions (e.g., ASARECA, AWARD) who provide financial support to promote the ABCF fellowship, workshops, and institutional capacity building activities*

To validate our findings and assumptions, we used a combination of tools to collect data and information:

- **Desktop research:** we analyzed demographics data and capacity building activities from the ABCF to understand the reach and scope of the program. Additionally, we analyzed ABCF's business plan, financials, and other related key documents to its growth and development.
- **Online surveys:** these were targeted at 6 ABCF stakeholder groups and were used to provide both quantitative and anecdotal data across performance and impact metrics.[7] The total population for the 6 bespoke online surveys was 619 ABCF affiliates and we received a total of **256 responses** (average 41% response rate across surveys). It is important to note that due to the very low response rate and incomplete data responses from externally funded researchers, we were not able to provide a meaningful analysis of this stakeholder group[8]. Secondly, of the 29 institutions surveyed we received a 55% response rate, of which the vast majority (c.80%) were from strong NARS as opposed to less-resourced NARS in the region. This inevitably skews the results in favour of the perspectives of strong NARS.
- **One-on-one interviews**; the primary purpose of the interviews was to provide additional depth and insight across key stakeholder groups to complement the survey insights on performance and impact.
    - **Selection criteria:** participants for the one-on-one interviews were selected using **stratified random sampling** in order to ensure we received insights from a representative sample, whilst at the same time minimizing selection bias. The considerations for sample

[6] Although not a part of the core capacity building activities of the ABCF, we included participants of the Agricultural Research Connections (ARC) networking workshop to get comprehensive insight into workshops run by the BecA-ILRI Hub

[7] Given the small sample size, institution investors were not surveyed but instead we held one-on-one interviews

[8] Dalberg only received one complete survey response from externally funded researchers.

stratification included: (1) Geographic location (2) Time elapsed since participation in program (duration) (3) Level of National Agricultural Research System (NARS) support by the different governments.

NB: Given the small size of the donor/investor institutions pool, the interview participants were handpicked based on prior knowledge and interaction with the BecA-ILRI Hub.

- **Sample size:** we conducted interviews with **30 ABCF affiliates.**

Sampling and stakeholder type

The BecA-ILRI Hub engages with a broad cross-section of stakeholders including multilateral bodies, regional and national networks and institutions, and individual researchers and scientists. The nature of these relationships differs and includes key influencers (e.g. policy setting organisations), strategic partners (e.g. AWARD/ASARECA), financial supporters (e.g. donors), and institutional and individual recipients of ABCF and the BecA-ILRI Hub's funding, facilities and services.

Figure 1: A proximity framework of key stakeholders' relationship to the BecA-ILRI Hub

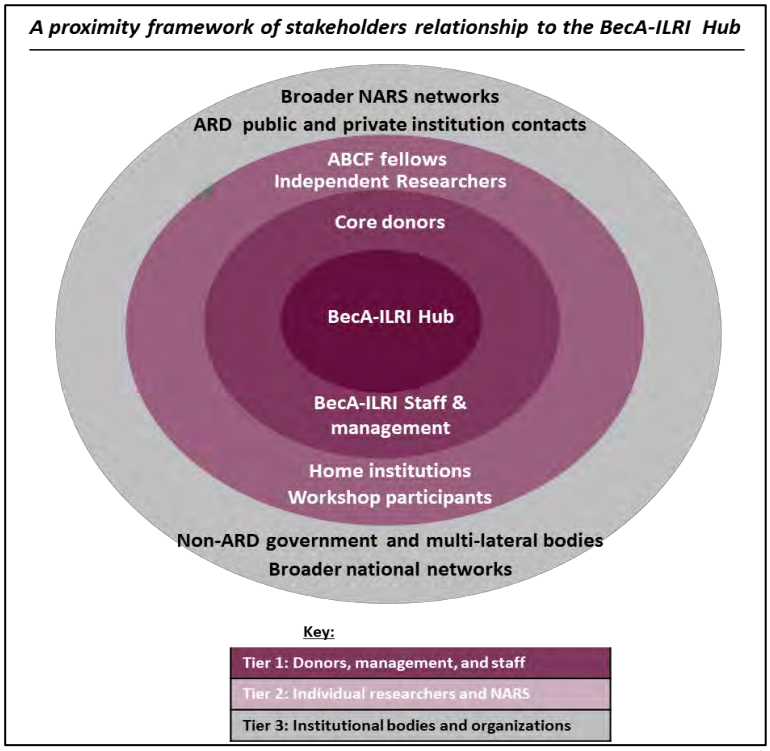


Figure 1 maps the key stakeholders based on their proximity to the BecA-ILRI Hub. Tier 1 includes stakeholders that are critical to the successful operation of the BecA-ILRI Hub (donors, management and staff). Tier 2 includes all stakeholders that have directly benefited from the BecA-ILRI Hub's facilities and capacity building activities (individual researchers and scientists, and national research institutes). Tier 3 includes key institutional bodies and organisations that help shape and influence the biosciences landscape in Africa.

Whilst we acknowledge the role and importance of all stakeholders, this evaluation focuses on Tier 1 and Tier 2 stakeholders as those most material to understanding the performance and impact of the BecA-ILRI Hub and ABCF program (either because they fund or operate the BecA-ILRI Hub, or because they directly engage with the BecA-ILRI Hub's facilities and capacity building activities).

Table 1: Summary of all the BecA-ILRI Hub stakeholders who participated in this evaluation study[9]

Stakeholder group	# of stakeholders contacted for survey[10]	Survey response rate (% of total)	Number of interviews completed
ABCF current fellows	29	90%	5 interviews
ABCF alumni fellows	95	61%	8 interviews

[9] Please see Appendix B for a list of all stakeholders interviewed

[10] Discrepancies in sample size indicated and actual stakeholder group is due to lack of up-to-date contact information

ABCF workshop participants	383[11]	31%	N/A
Externally funded researchers	25	<5%	N/A
Research institutions	28	64%	4 interviews
The BecA-ILRI Hub staff and extended faculty	64	45%	8 interviews
Donors and co-funders	9 (5 donors, 4 co-funders)	N/A	5 interviews

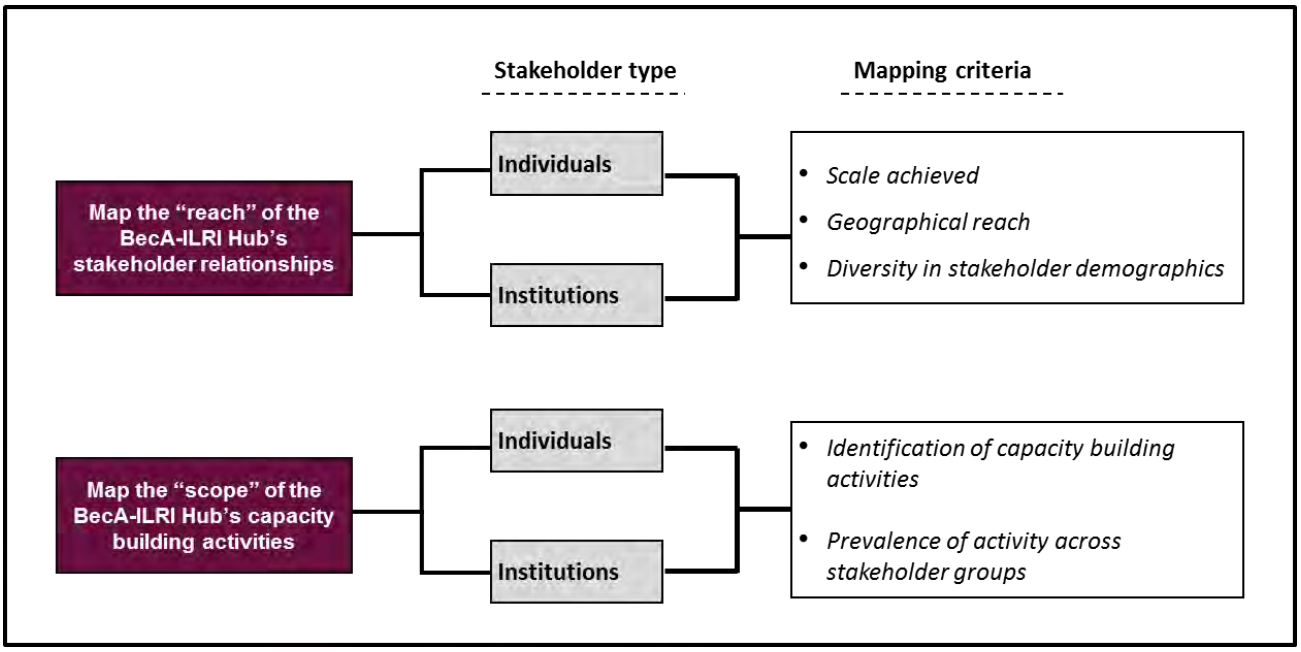
3. Mapping the reach and scope of the BecA-ILRI Hub's capacity building activities

Our evaluation framework assesses the *reach* of the BecA-ILRI Hub's capacity building *relationships* by identifying the different stakeholder cohorts the BecA-ILRI Hub engages across both individual and institutional dimensions for Tier 1 and Tier 2 stakeholders (see Figure 1). Where relevant we have included any of the BecA-ILRI Hub key performance targets to indicate sufficiency in meeting key criteria including:

- Scale: number and type of stakeholders reached
- Geographical reach within the region
- Diversity within stakeholder cohorts: individuals researchers (gender, level of research expertise, research field) and AR4D institutions (strength of home NARS)

We have assessed the *scope* of the ABCF's capacity building program by defining the individual and institutional capacity building activities as well as the prevalence within each cohort. This is particularly important for NARS institutions, where there is significant disparity in level of engagement/prevalence of the BecA-ILRI Hub across activities. Figure 2 below summarizes our approach.

Figure 2: Framework for assessing the reach and scope of ABCF's capacity building activities



[11] Excludes any respondents who also took part in the ABCF fellowship

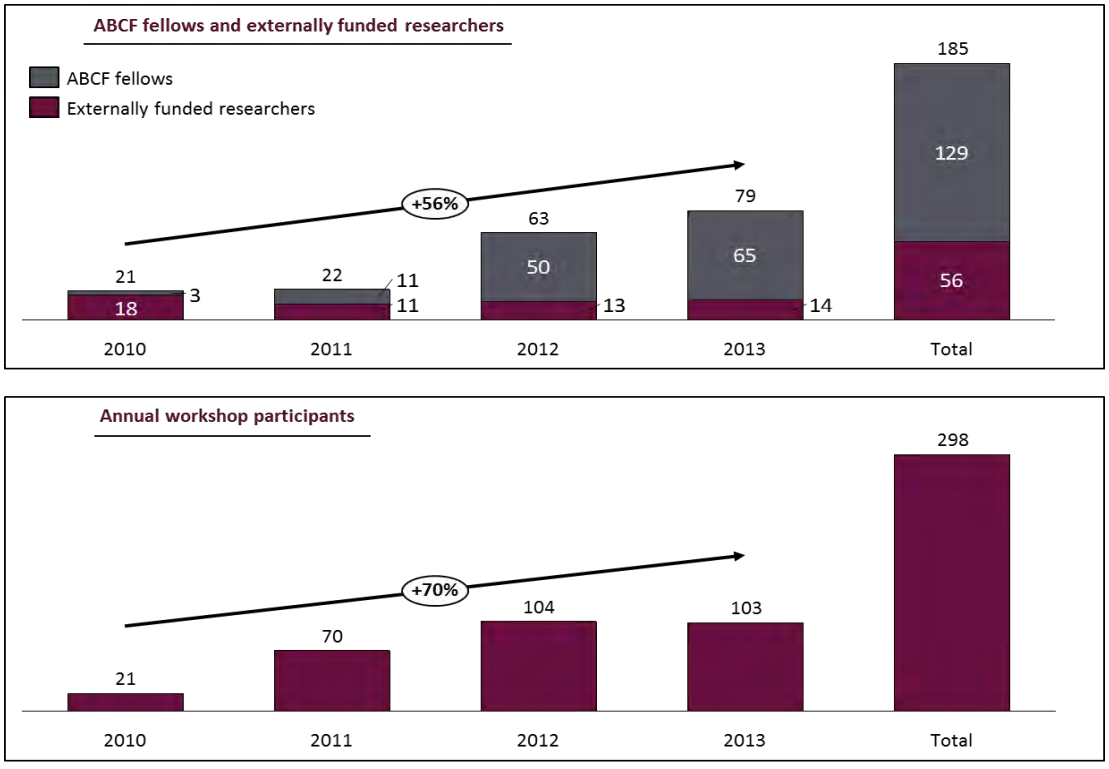
3.1. Mapping the BecA-ILRI Hub's reach

Assessment of the BecA-ILRI Hub's "reach" with individual beneficiaries

Scale achieved

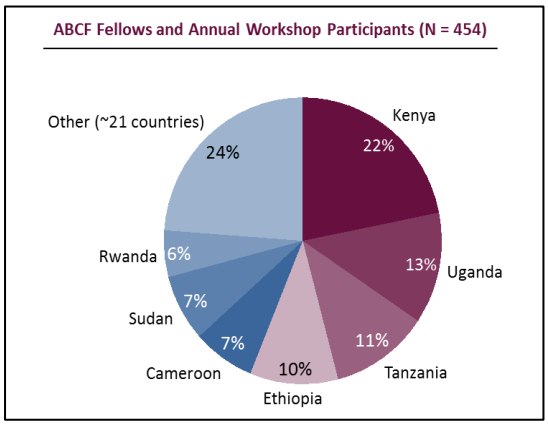
Given the sheer number of fellows, workshop participants, and individual researchers we see a clear picture of successful growth. The BecA-ILRI Hub has delivered capacity building activities to c.500 individuals since 2010, with an average 56% year-over-year growth for fellows and externally funded researchers, and 70% year-over-year growth for workshop participants (2010 – 2013). Figure 3 below highlights this reach by year.

Figure 3: Scale of the reach of ABCF to individual researchers and scientists[12]



Geographical reach

Figure 4: Geographic reach of the ABCF



Though ABC fellows and annual workshop participants come from a wide variety of countries there is a concentration of representatives from Kenya, Ethiopia, Uganda, and Tanzania; approximately 56% of all ABCF fellows and workshop participants to date are from these four countries (see Figure 4).

This geographic concentration also extends to language. Approximately 53% of fellows and workshop participants of east and central African origin come from English-speaking countries, and 12% from French-speaking countries although

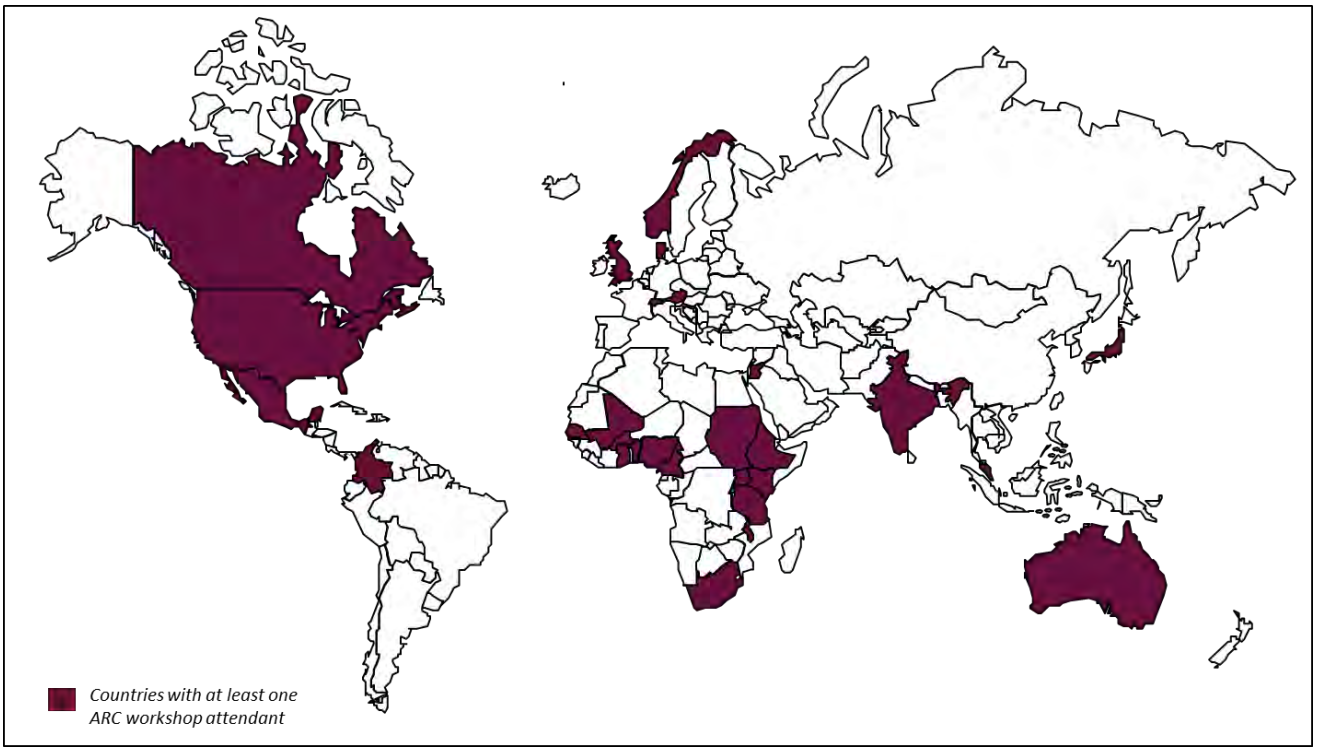
[12] Placements are based on the year the researchers enrolled at the BecA-ILRI Hub. For the ABCF fellows, the numbers shown represent numbers of fellowships awarded i.e., does not take into account fellows whom may be repeaters

English-speaking countries make up 33% of east and central Africa's population and French-speaking countries make up 27%[13]. Given the BecA-ILRI Hub operates in English and scientific publications are mostly in English, there is an explicit bias towards qualified English speakers who are more likely from English speaking countries. While concerns and justifications were mentioned in stakeholder interviews no group or internal document has outlined a sufficient Anglophone or Francophone primary language target – only English proficiency.

Based on our interviews with fellows, another explanation for the limited reach to French speakers has been that the majority of Francophone researchers come from less-resourced NARS systems and have a harder time meeting the application criteria when compared to their Anglophone counterparts (see Figure 10). Given the demand for the BecA-ILRI Hub's services is so great across languages and regions, the BecA-ILRI Hub has been able to focus ABCF programmatic activities on core East African, English speakers and still maintain a fast growth trajectory. However, it also raises a broader question on access and inclusivity of the BecA-ILRI Hub's services.

In addition to the ABCF fellowship and the annual workshops, the BecA-ILRI Hub has also been involved in ad hoc workshops such as the Agricultural Research Connections (ARC) workshops which were held in 2013 and have had an extended reach throughout the world (Figure 5 below highlights this reach). The ARC workshops had a total of 229 participants. Amongst African institutes, majority of ARC participants came from Uganda, Kenya, Tanzania, Ethiopia, and Nigeria, which is a similar breakdown as the ABCF fellowships and annual workshops (with the exception of Nigeria)[14].

Figure 5: Geographic reach of Agricultural Research Connections (ARC) workshop



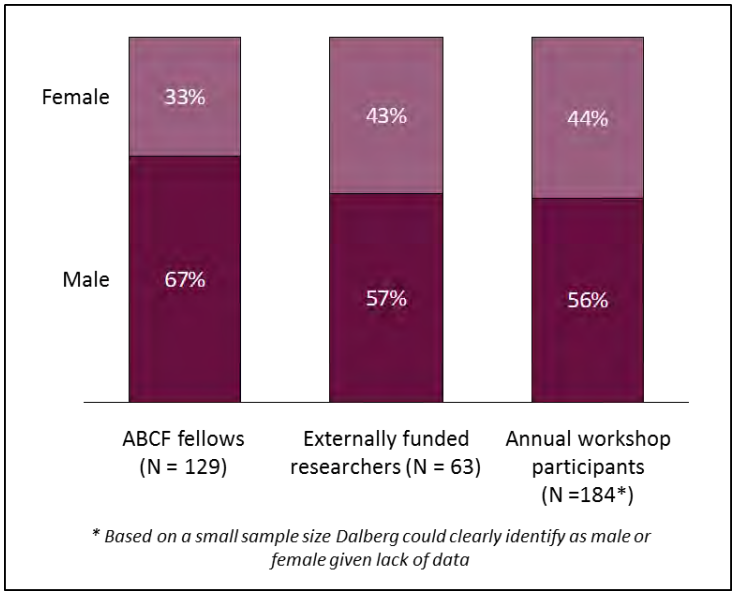
[13] See Appendix C for breakdown of ABCF fellowship by languages in east and central Africa

[14] See Appendix C for breakdown of ARC workshop by country

Gender

In order to leverage the full scientific capacity on the African continent, female scientists must be enabled to thrive alongside their male colleagues. The BecA-ILRI Hub has a specific gender target of 50% and a minimum threshold of at least 33% female researchers cutting across all ABCF activities[15]. To date the BecA-ILRI Hub has met its minimum threshold for female fellows at 33% of ABCF fellows and 44% of annual workshop participants. The gender breakdown across activities is provided in Figure 6.

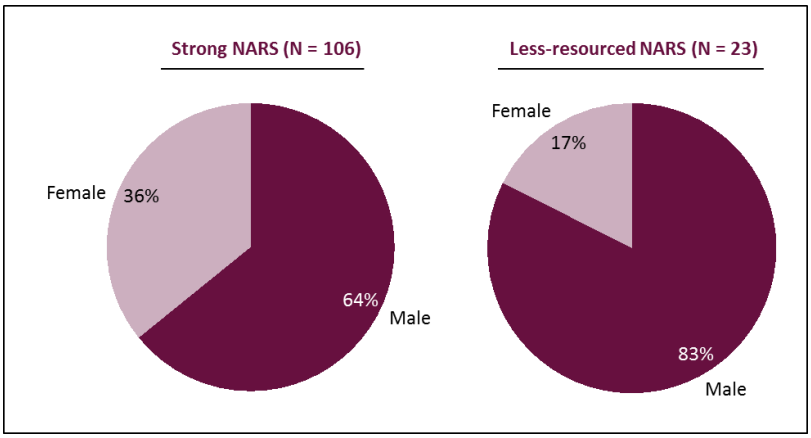
Figure 6: Gender breakdown across different capacity-building activities



Through stakeholder interviews the challenges raised in attracting female researchers are two-fold: general lack of gender equality in the biosciences and family demands that make it difficult for researchers to be based at the BecA-ILRI Hub. Although the ABCF has been successful in fulfilling its quota of female scientists, the biosciences and Agricultural landscape in Africa remains male-dominant. In fact, research conducted by AWARD and ASTI in 2009[16] showed only one in four agricultural researchers in Africa is female (i.e., 25% female prevalence). This challenge provides a unique opportunity for ABCF and the BecA-ILRI Hub in general to further engage female researchers and scientists through providing mentoring opportunities and addressing logistical challenges that will drive female engagement in the BecA-ILRI Hub's capacity building activities. This is especially important given that majority of those who produce, process, and market Africa's food are women (AWARD/ASTI, 2009).

Furthermore, there is a disparity in gender-reach between strong NARS vs. less-resourced NARS. Less-resourced NARS women scientists make-up only 17% of all scientists compared to 36% in strong NARS (see Figure 7). This presents an opportunity for the BecA-ILRI Hub to partner jointly with AWARD to increase the number of female scientists from less-resourced NARS.

Figure 7: Gender breakdown of ABCF fellows

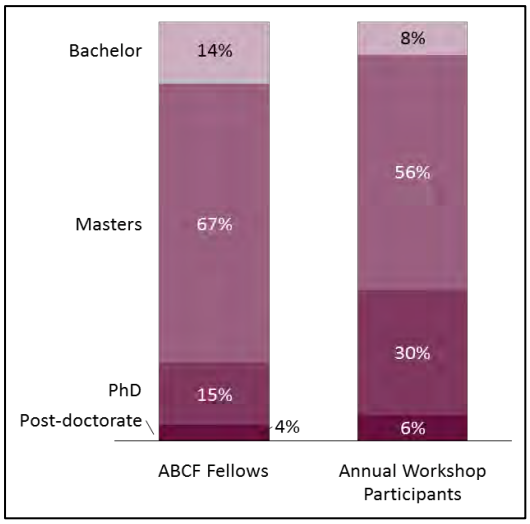


[15] Similar to the broader ILRI targets which aims to increase number of women participating in sciences at ILRI and partners institutions (and to exceed 30%). This is outlined in the "Strategy and plan of action to mainstream gender in ILRI", March 2012

[16] AWARD/ASTI. Women's participation in Agricultural research and higher educations. Key trends in sub-Saharan Africa, July 2009

Level of education

Figure 8: Highest level education completed



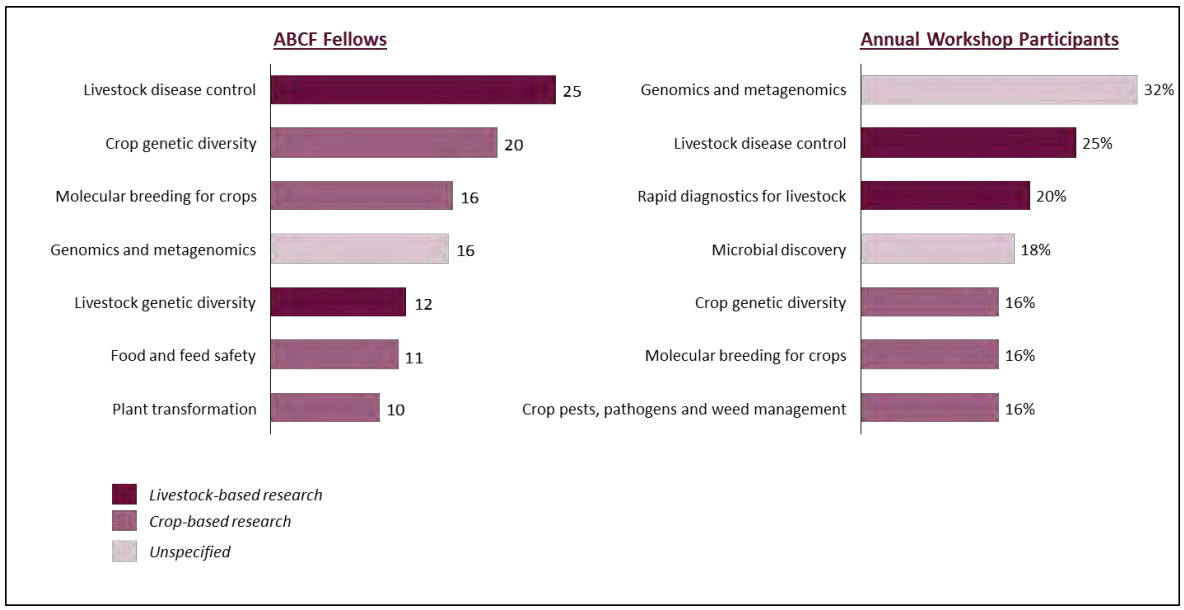
Based on our survey sample we approximate the level of experience across ABCF researchers (fellows and workshop participants). The typical ABCF researcher holds a Master's degree (Figure 8). The ABCF Fellowship's success to date has been in focusing on MSc level scientists through university or research institute organizations. While there is no benchmark for outreach to junior versus senior scientists outlined by the BecA-ILRI Hub, in speaking with respondents both bring their own advantages and disadvantages to the Hub.

In general, interviewees viewed junior scientists as singularly focused on their research, owning their work, and putting in extra time and follow up to achieve all research objectives. However, this was perceived by some to come at the neglect of other non-related fields and skills. However, several interviewees highlighted the initial difficulty of getting senior scientists to follow laboratory rules and conduct relatively minor research protocols and procedures.

Research fields

Given the BecA-ILRI Hub's value proposition as a top notch research platform it is important to note how individual stakeholders classify themselves by the research they conduct. Through the one-on-one interviews, it was highlighted that there were mixed perceptions about the BecA-ILRI Hub being biased toward either livestock research or crop research which inevitably influences recruitment. However, survey results show a relatively even split between the two. Figure 9 below shows the top seven research fields of the ABCF fellows and workshop participants. As is evident, there is a relatively even split between researchers focused on livestock and those focused on crops. Although neither the BecA-ILRI Hub nor the ABCF program provides a target for outreach to either of these research areas, it will be important to dispel this miss-perception that might otherwise skew the type of researcher who applies to the ABCF program.

Figure 9: Research fields of individual researchers (i.e., ABCF fellows and workshop participants)



Assessment of the BecA-ILRI Hub's "reach" to institutional beneficiaries

Scale achieved

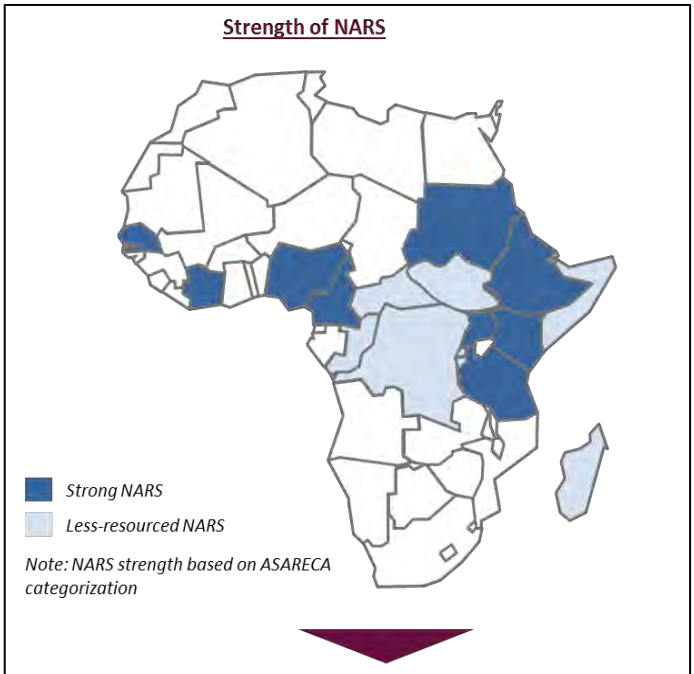
NARS organisations include national agricultural research institutions (NARIs), universities, public and private extension organisations, NGO's and the private sector. For the purposes of this evaluation, we further categorize these organizations into Group 1 and Group 2 institutions based on the consistency of established relations between these organizations and the BecA-ILRI hub. The Group 1 group (74 institutions) includes those actively engaged with the BecA-ILRI hub across ABCF activities. Sending fellows is the most prevalent method of interaction. The Group 2 group (176 institutions and more) do not actively engage with the BecA-ILRI Hub but have infrequent short-term contact. Historically, the ABCF has successfully targeted 18 countries in which to actively engage (see Figure 10 below).

This evaluation has focused on the Group 1 NARS organizations that send fellows and/or workshop participants to the BecA-ILRI Hub and engage with the BecA-ILRI Hub on institutional capacity building activities (i.e. home institutions). We used a sample set of 29 home institutions from this segment to understand performance and impact. These 29 were provided by the BecA-ILRI hub under the assumptions of being broadly representative.

Geographical reach and strength of Group 1 home institutions

These home institutions interact with ABCF through each of its four activities: ABCF fellowship, workshops, institutional capacity building, and advocacy-awareness. Over time they help to source workshop participants, enable Fellowship applicants, and act as lower-end AR4D Hubs to advance food security work in the region. While we will explore the scope of these relationships in the next section, the extent to which the BecA-ILRI hub has created these connections is vital to the health of the BecA-ILRI Hub's growth. Our analysis of the BecA-ILRI Hub's database showed that 36% of all home institutions are based in Kenya, Uganda, Tanzania, and Ethiopia, and likewise 56% of fellows and workshop participants.

Figure 10: Strength of National Agricultural Research Systems



Host Countries of Group 1 Home Institutions (N =18)	Number of Fellowships (N = 152)	% of Total
Strong NARS (N = 9)	124	82%
Less-resourced NARS (N = 9)	28	18%

From the accompanying heat map (Figure 10) we see we can see the breakdown of strong versus less-resourced NARS, with the vast majority of fellows (82%) coming from the former. There appears to be two drivers of this: (i) scientists eligible for the fellowship are more likely to reside in strong NARS systems that promote advanced AR4D research, and (ii) strong NARS institutions may be better at driving awareness of fellowship opportunities and supporting applicants. There is also a strong correlation between strong NARS and English speaking countries, and we see a gap in engagement with non-English, less-resourced-NARS communities.

Strategic partnerships with capacity building programs in eastern and central Africa

The BecA-ILRI Hub has partnered with other capacity building programs in eastern and central Africa over the years in order to diversify its reach to individual researchers. In 2011, they entered into a strategic capacity building partnership **African Women in Agricultural Research and Development (AWARD)** to support African women agricultural scientists. AWARD is a professional development program that strengthens the research and leadership skills of African women in agricultural science through tailored fellowships. AWARD offers their fellows the opportunity to compete for advanced science training placements at internationally recognized research institutions. AWARD and the BecA-ILRI Hub (through its ABCF fellowship program) co-sponsor research placements for AWARD fellows at the BecA-ILRI Hub, enabling fellows to receive advanced science training and carry out a research project of their choice. From 2011 to 2013, the BecA-ILRI Hub and AWARD have co-sponsored six women agricultural scientists from Kenya and Nigeria for advanced training and research at the Hub. AWARD's monetary contribution to these placements was approximately $120,000.

In 2012, the BecA-ILRI Hub entered into a strategic partnership with the **Association for Strengthening Agricultural Research in Eastern and Central Africa (ASARECA)**, to build the capacity of the less competitive NARS in eastern and central Africa, and to engage more with those countries that are generally under-represented in the BecA-ILRI Hub's capacity building activities. Through this partnership the BecA-ILRI Hub and ASARECA have co-supported 11 ABCF fellows from NARS in Democratic Republic of the Congo, Eritrea, Madagascar, Rwanda and Sudan. ASARECA's contribution to the partnership activities was approximately $175,000.

The BecA-ILRI Hub established a capacity building partnership with the **International Foundation for Science (IFS)** in late 2012 – the IFS provides grants to early career researchers from the developing world. This partnership is designed to take a well-rounded approach to funding of fellows' research: the BecA-ILRI Hub will support research at the Hub, while IFS will fund field research and research at the home country institute, which currently are activities not supported by the ABCF. To date no fellows have been supported through this partnership, although two fellows are currently in the pipeline.

Lastly, the BecA-ILRI Hub has partnered with **United Nations Educational, Scientific and Cultural Organization (UNESCO)** to strengthen research and teaching capacity in Bioinformatics and Genomics in the African agricultural sciences research community, particularly women. UNESCO provided funding which enabled 20 women scientists from the region to participate in the 2012 and 2013 Advanced Genomics and Bioinformatics workshops organized by the BecA-ILRI Hub.

3.2. Scope of the BecA-ILRI Hub capacity building activities

The scope of the BecA-ILRI Hub's capacity building activities is defined by the activities the BecA-ILRI Hub has underway across individual and institutional stakeholder groups. These activities seek to address two key capacity constraints in addressing issues of food security and quality in the region: (1) Shortage of highly skilled African scientists and researchers; (2) Shortage of AR4D institutions with strong biosciences capabilities in East and Central Africa. In Figure 11 below we summarize these two constraints and the ABCF's approach in addressing these issues.

Figure 11: Scope of the BecA-ILRI Hub's capacity building activities across different individual stakeholders

Since the formation of the ABCF program, the fellowship and workshops have become more systematized and expansive resulting in a deeper Hub footprint amongst individual scientists and researchers. However, the focus on enhancing individual capacity has left the institutional capacity building and advocacy-awareness activities less developed, both in volume of institutions the BecA-ILRI Hub engages with and in the range of capacity building activities. To determine prevalence of these activities within the different stakeholder cohorts, we analysed the "penetration" of the BecA-ILRI Hub's activities – indicated by the proportion of stakeholders who access the service offering. This analysis is summarized in Tables 2 and 3 below:

Table 2: Scope of the BecA-ILRI Hub's capacity building activities across different individual stakeholders

Relevant stakeholders	Capacity building activities	Proportion of stakeholders who access service offering[17]
Target audience: Crop and livestock scientists, MSc/PhD qualifications, Africans nationals		
Fellows	Access to top class laboratory facilities and materials	●
	Training and mentoring to develop hard and soft skills	●
	Networking opportunities	◕
	Support in securing funds for research	◔
Alumni	Informal engagements e.g., assistance with scientific paper writing, invitation to ARC workshop	◔
Workshop Participants	Training and skills development	●
	Networking opportunities	●

Key: ◔ 0 - 25% penetration ◕ 51 - 75% penetration ○ Not applicable ◑ 26 -50% penetration ● 76 -100% penetration

[17] Survey results assumed to be representative of all stakeholders

An analysis of the BecA-ILRI Hub's activities shows that the BecA-ILRI Hub achieves consistency in its core offerings to workshop participants and fellows. However, currently the BecA-ILRI Hub does not have any formal service offerings for their alumni fellows that would drive their engagement. Additionally, less than 25% of all fellows leverage the BecA-ILRI Hub's support in securing funds to further their research. These two gaps provide an opportunity for the BecA-ILRI Hub to support scientists along the impact pathway and ensure continuation and implementation of research after the ABCF fellowship.

Home institutions engage with the BecA-ILRI Hub through three primary channels: First, ad-hoc connections made by the BecA-ILRI Hub management at AR4D events around the globe; Second, project specific collaborative relationships built around networking, fundraising, and facility building goals; Third, formal MOU partnerships or "Nodes" that are aimed at providing lower-end AR4D facilities for regional use. In table 3 below, we highlight the key capacity building activities that the BecA-ILRI Hub employs to strengthen biosciences and agriculture capacity in home institutions.

Table 3: Scope of the BecA-ILRI Hub's capacity building activities across home institutions

Relevant stakeholders	Capacity building Activities/ Service Offering	Proportion of stakeholders who access service offering[18]
Target audience: AR4D-focused universities, AR4D-focused research institutes, AR4D-focused, private sector (incl. NGOs), AR4D-focused public sector		
Home Institutions	Individual capacity building • Training/skills development of individual researchers (through fellowships and workshops)	
	Institutional capacity building	
	• Support in securing funding for capacity building activities	
	• Connections to networks and key influencers (e.g., suppliers of reagents and lab equipment	
	• Technical assistance (e.g., lab design and management)	
	Advocacy support	

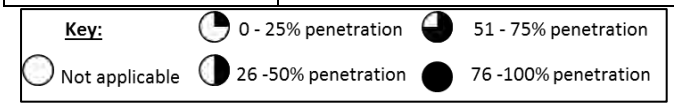


Table 3 above highlights the disparity in uptake of capacity building activities across home institutions. Whilst almost all home institutions receive capacity support through training of individual researchers via fellowships and workshops, the broader institutional capacity building activities are less consistent with c.50% of them receiving support from the BecA-ILRI Hub on funding activities and network/connection building. The BecA-ILRI Hub's offering on technical assistance and advocacy is even more targeted with only c. 25% of institution accessing these services. We will assess the performance and the sufficiency of these activities in more detail in the performance section of the report.

[18] Survey results assumed to be representative of all stakeholders

Summary of reach and scope of the BecA-ILRI Hub's relationships and capacity building activities

Key Strengths

- **Successful implementation of the ABCF program** as indicated by its reach to approximately 500 unique researchers and bio-scientists to date (129 = ABCF fellows, 56 externally funded researchers, 298 = annual workshop participants) and c.250 home institutions across the region in only four years of operation
- The BecA-ILRI Hub has been **successful in achieving its minimum threshold of recruiting at least 33% female researchers and/or scientists through its capacity building activities**. To date, female researchers make up approximately 33% of ABCF fellows – although they have yet to reach the 50% target.
- The BecA-ILRI Hub has been particularly successful in supporting individuals and institutes in Kenya, Uganda, Ethiopia and Tanzania, which make up 56% of the ABCF fellowship and annual workshops, whereas 36% of all home institutions they engage with, are in these same countries.
- The BecA-ILRI Hub provides a **diverse range of capacity building activities that are tailored to meet the needs of different stakeholders**. For individual stakeholders, the BecA-ILRI Hub provides the ABCF fellowship, training seminars/workshops, and networking workshops. Home institutions are engaged through individual capacity building activities (i.e., ABCF fellowships and workshops) as well as institutional capacity building activities (i.e., technical assistance, advocacy support, and connections to key networks and influencers

Development Needs

- **Greater geographic diversity**; Kenya, Uganda, Tanzania, and Ethiopia represent 56% of all fellows and workshop participants to date, and 36% of home institution partnerships (defined as Tier 1 home institutions).
- **Greater reach of the BecA-ILRI Hub in Francophone countries**; over the past three years, 53% of fellows and workshop participants of east and central African origin have been from English-speaking countries, and 12% from French-speaking countries although English-speaking countries make up 33% of east and central Africa's population and French-speaking countries make up 27%
- **Achieving the right balance between 'depth' and 'breadth' of support**: From an individual capacity building perspective, whilst the fellowship achieves depth of engagement with researchers/scientists it is on a restricted scale (c.129 to date) whilst the training workshops achieves greater reach (c.298 to date) but has a much more limited scope of engagement (1-2 weeks). The workshops do play an important role in driving awareness of the BecA-ILRI Hub and in addressing specific targeted training needs in the region.
- The BecA-ILRI Hub could increase its collaborations with ASARECA to **increase its engagement with less-resourced NARS** within the region; currently only 18% of fellows are from countries with less-resourced NARS. Likewise, the BecA-ILRI Hub achieves lower engagement on capacity building activities with the less-resourced NARS.
- **Limited engagement of home institutions in some key capacity building activities**; less than 25% of institutions have collaborated with the BecA-ILRI Hub in advocating for biosciences in the region or leveraged the BecA-ILRI Hub's technical expertise to strengthen biosciences capabilities in the institutions

4. Assessing the performance of the ABCF program

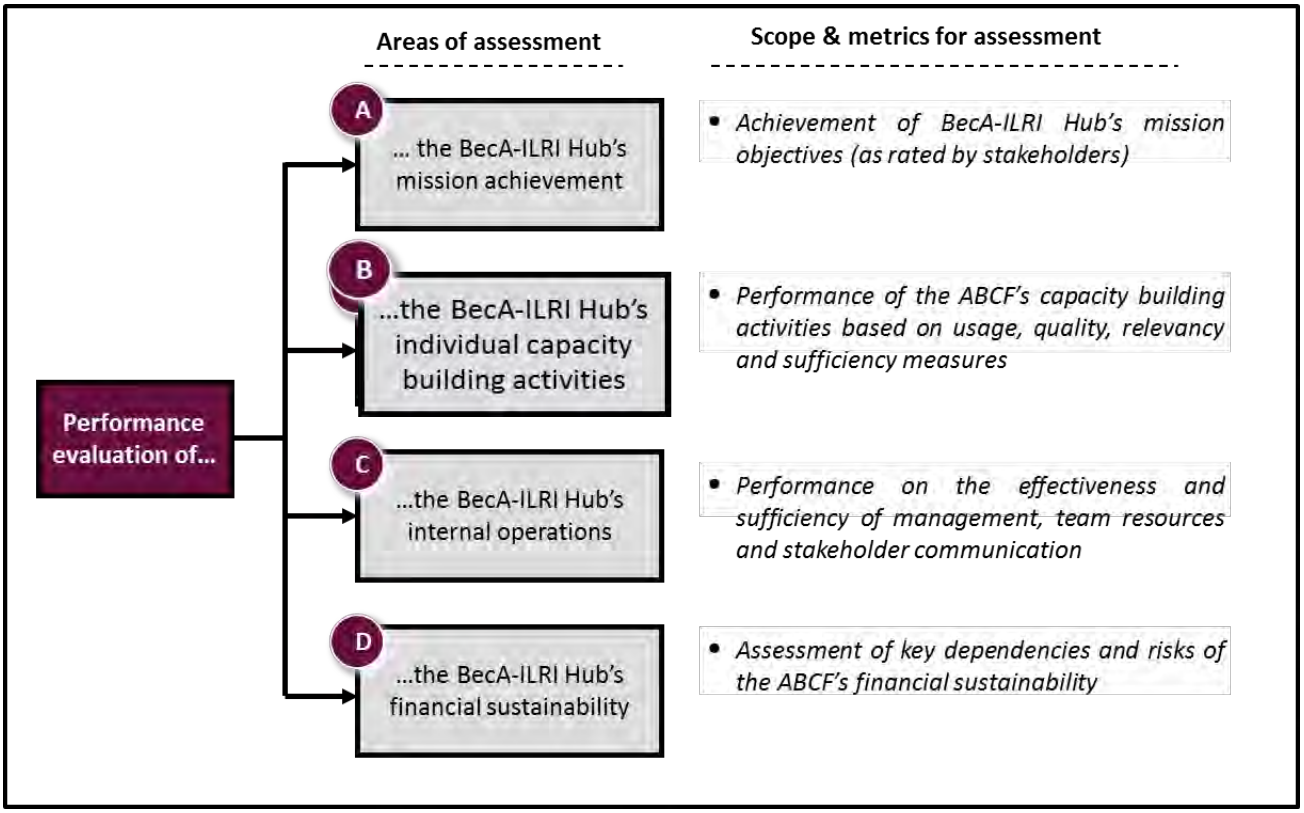
Evaluation objective and our approach including framework

This performance evaluation is a diagnostic tool of the BecA-ILRI Hub's formation, bearing, and expansion of the ABCF capacity building program. We assess *performance* by aggregating feedback from both individual and institutional stakeholders, as well as the BecA-ILRI Hub's business plan, financials and other key review documents. Where they exist we have assessed performance against the BecA-ILRI Hub KPI's and targets, to be able to take a perspective on sufficiency. We have focused on assessing four key areas of Hub performance:

- *Overall performance against mission*
- *Performance of the BecA-ILRI Hub's core individual and institutional capacity building activities*
- *Performance of the BecA-ILRI Hub's internal operations, specifically focused on sufficiency and quality of resourcing and stakeholder communications*
- *Perspectives on the financial sustainability of the BecA-ILRI Hub.*

The key performance criteria we have focused on in our assessment are relevancy, sufficiency, quality and effectiveness of the BecA-ILRI Hub's resourcing and operations, as well as highlighting areas of key risk and dependency. Figure 12 below summarizes our approach.

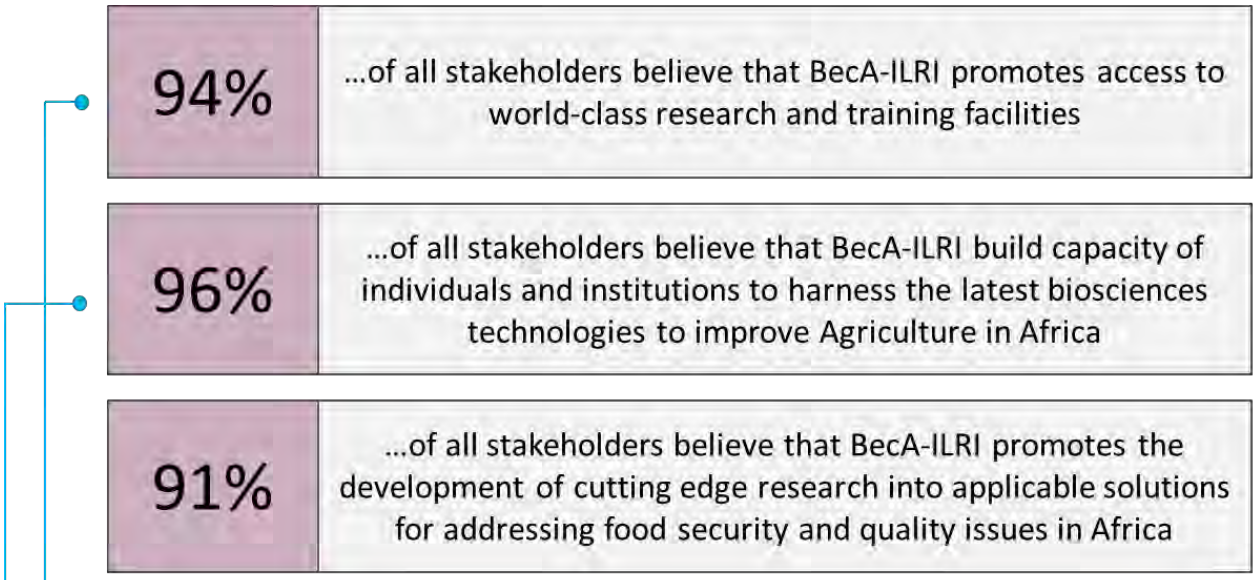
Figure 12: Framework for evaluating the performance of the ABCF



4.1. Performance of the BecA-ILRI Hub against its mission

The BecA-ILRI Hub is mandated to promote access to world-class research and training facilities, to build the biosciences capacity of individuals and institutions, and promote African scientists to lead and sustain biosciences research in Africa. It is a testament to the BecA-ILRI Hub's performance that over 90% of all respondents across key stakeholder groups state that the BecA-ILRI Hub is achieving this to date.

Figure 13: Performance of the BecA-ILRI Hub against its mission



" The BecA-ILRI Hub facilities are like a laboratory in Europe but put in Africa" – ABCF Alumni

"The technical platform [provided by the BecA-ILRI Hub] was very useful; I was going to do research in France but it wasn't affordable. The ABCF provided both financial and technical support like lab materials and mentorship. I was doing things I would never have been able to do in Cameroon." – ABCF Alumni

" When I came to the Hub I expected to build my own capacity – I have gained confidence because of the weekly presentations and I have also learned new skills. For example I can now write lab reports and manuscripts. I also learned new lab management skills and protocols like RNA extraction, genotyping, nested PCR. I want to introduce these Friday presentation at my own institution." – ABCF current fellow

Similarly against a range of comparative benchmark institutions offering bio-sciences training and workshops, over 90% of stakeholders surveyed rated the BecA-ILRI Hub as "much better than" these AR4D research programs. These stakeholders (the BecA-ILRI Hub staff and workshops participants) are well placed to assess the AR4D landscape, given their networking experience through events such as the ARC workshops. In particular they score the ABCF program as "excellent" in provision of world class facilities and commitment to mission respectively (see Appendix C).

4.2. Performance of the ABCF's capacity building activities

Individual stakeholders

We evaluated performance of the BecA-ILRI Hub's individual capacity building activities (workshops and fellowships) through the performance metrics of usage, relevancy, quality, and sufficiency in cases where a Hub KPI or target exists.

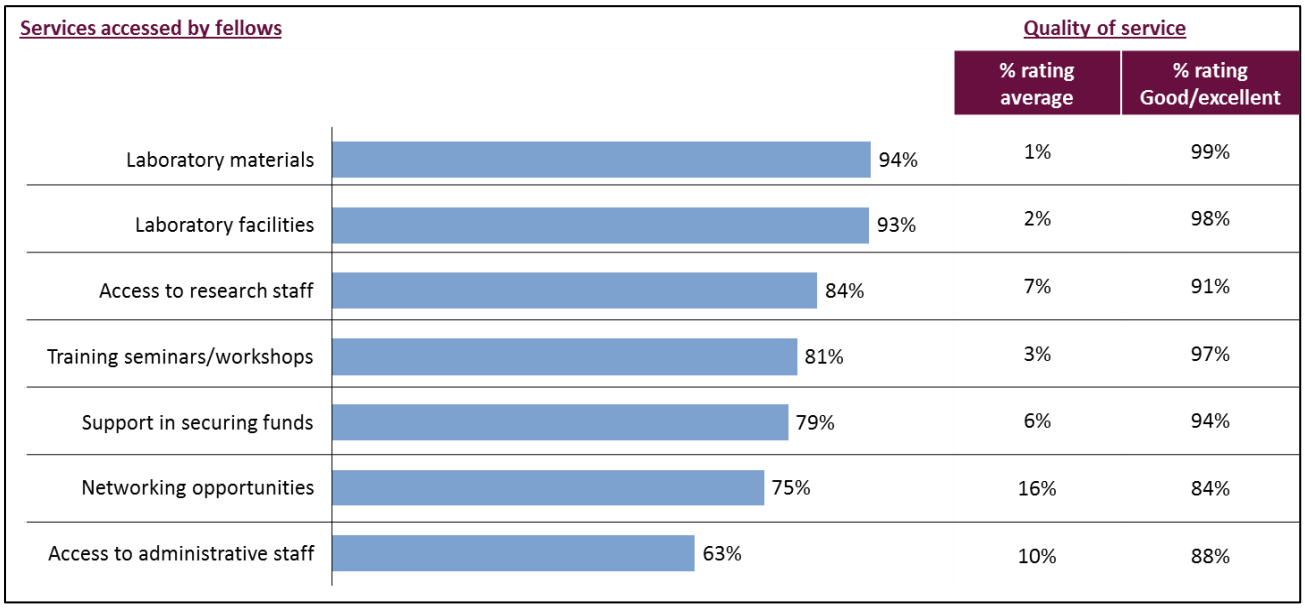
Overall strong performance on satisfaction, relevancy and quality of fellowships:

90% of stakeholders said they were satisfied or highly satisfied with the fellowship, which is a strong indication of overall performance. This is supported by the feedback on the availability of the full range of services and resources to fellows, who have the most consistent ABCF contact with the BecA-ILRI Hub. As seen below, it is a positive indication that not only is there very strong use by fellows of core activities and resources (over 90% use the lab materials and facilities and training seminars/workshops) but also high usage of secondary services such as the BecA-ILRI Hub's support in securing funds, and professional networking opportunities (over 75% of fellows have accessed both).

Whilst "access to administrative staff" scores comparatively low (only 63% of fellows) it is unclear from the survey responses whether this is due to insufficient staff availability or a lack of fellow demand for administrative support. Based on our interviews it appears few day-to-day fellow queries reach the core BecA Hub staff, as most are addressed by research assistants and senior scientists. An area of analysis is to look into ways to channel administrative related queries to the operations team, thus freeing up Research Assistants and Senior Scientists to focus on research related queries.

The ABCF program performs very strongly from a 'quality' perspective with over 98% of fellows rating its laboratory materials, facilities, as either "good" or "excellent" and over 90% rating mentoring and training the same.

Figure 14: ABCF service offerings that have been accessed by fellows



Targeted performance concerns relating to project management and workshop participants' access to facilities and diversity of training topics:

The most referenced operational pain point in interviews with visiting scientists was the lack of project milestone completion. A common origin of these was on-boarding delays often resulting in a compressed research time frame. While 91% of our responding fellows did "discuss relevant project strategies," approximately 45% did not "identify external risk factors for their projects" and 47% did not "complete all

major milestones and key deliverables within the planed time frame." In an effort to address some of these issues, the ABCF management has extended the length of the ABCF fellowship from six months to up to one year, as well as tightened the focus of the application requirements over the past three years.

An area of marginal concern from workshop participants' feedback is training facilities-lab equipment and diversity of training topics. 12% of workshop participant's felt that the training facilities and laboratory equipment were lacking versus 2% for fellows. As no interviews were conducted with only-workshop participants this prevents us from highlighting specific problems. This is an area for further exploration.

8% of workshop participants were concerned with the "diversity of training topics." Investigating this further we identified a synergy with training relevancy. Primarily, no interviewee stated that the four ABCF topics were irrelevant; specifically, alumni confirm they use the molecular biology (63%) and bioinformatics (58%) training knowledge on a regular basis. Instead respondents highlighted the need to tailor the topics to experience levels (i.e. junior versus senior scientists) and along project management themes.

A positive correlation between fellowship services used the most, rated the highest quality, and deemed the most relevant

Figure 15: Top ABCF fellowship service offerings

Most important benefits received from ABCF Fellowship	ABCF Alumni	Current ABCF Fellows	RANKING
Access to lab materials and facilities			1
Funding			2
Time dedicated for research			3
Peer networks			4
Mentorship			5
Human resource support			6
Access to academic materials (e.g., online journals)			6
Job opportunities			8

Key: Top 2 options; All other options; Bottom 2 options

We see a direct positive relationship between fellows' usage and quality rating of resources and the ranking of the most important benefits received (relevancy) through the ABCF fellowship. Access to lab materials and facilities and funding support are identified as the top 2 most important benefits of the ABCF fellowship while achieving the highest usage and quality performance scores.

This analysis presents an opportunity to improve on performance. One example is building upon the staff and fellows weekly progress report seminars; a highly rated activity which strengthens mentorship and peer networks. A majority of interviewees cited this as a primary benefit of the ABCF program but - aside from in-project troubleshooting and Research Assistant training modules - could not reference any other structured mentorship or peer networking activity. This lack of structure means that the BecA-ILRI Hub is not fully leveraging a highly beneficial ABCF activity. For current fellows, the BecA-ILRI Hub is implementing formal mentorship reporting as an accountability mechanism for what has been ad-hoc Senior Scientist – Researcher interactions. Furthermore, in January 2014 the fellowship launched the Participant Action Plan Approach (PAPA) where matriculating fellows are required to hold three awareness raising activities at their home institutions.

Lack of available key performance targets makes assessing sufficiency challenging

It is challenging to assess the sufficiency of the BecA-ILRI Hub's performance on fellowships and workshops, as according to our meetings with staff there were no formal KPI's or targets actively measured against before January 2014. Previously the BecA-ILRI Hub set targets of 50% female scientists, four annual workshops with a minimum of 24 participants, and a minimum of 50 ABCF fellows (on a non-FTE basis) a year. Currently, all of these are being achieved (average 33% female researchers, four annual workshops all exceeding 24 participants, 52 fellows in 2013; see section 3.1 for full breakdown). Entering 2014, the BecA-ILRI Hub will aim to provide 11 annual workshops and reach at least 35 fellow FTEs.

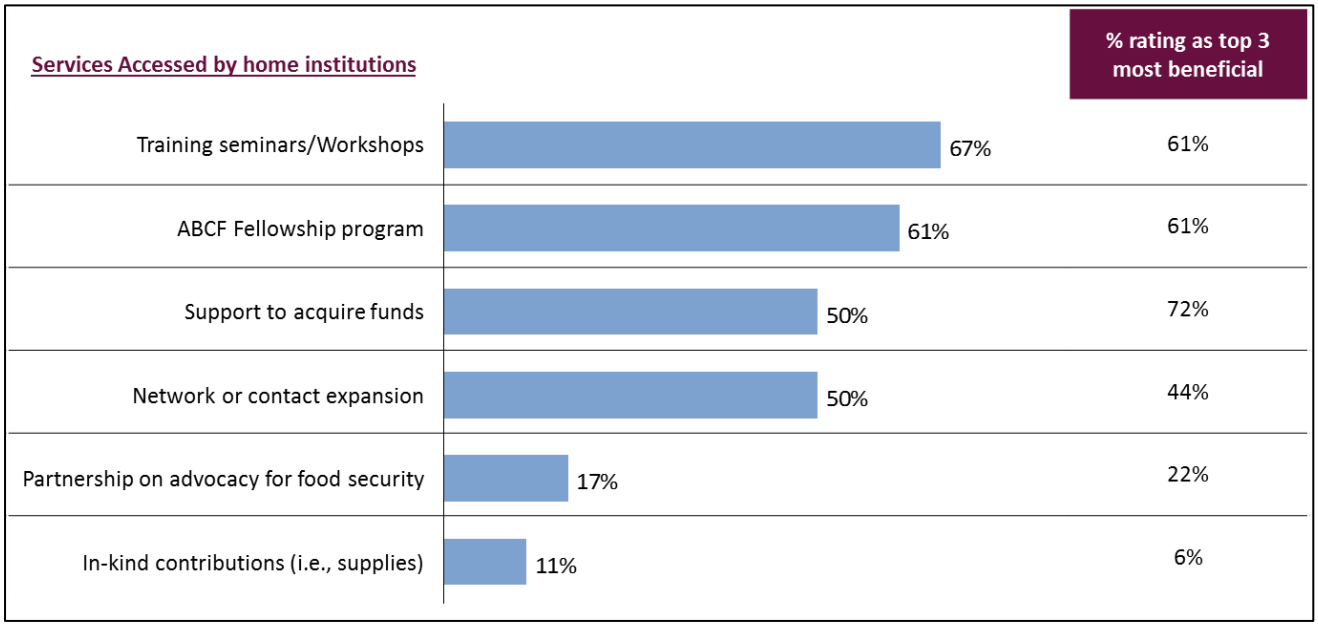
Home institutions

As outlined in section 3.1, there is significant diversity in the breadth and depth of capacity building and engagement between the BecA-ILRI Hub and individual Home Institutions. Group 1 home institutes are those that are in regular contact with the BecA-ILRI Hub and Group 2 home institutions are those that are not. In their unique position as a beneficiary of the BecA-ILRI Hub's capacity building opportunities and enabler of individual researchers, home institutions exhibit similar trends in services accessed. As seen below, we note the following two performance trends in the BecA-ILRI Hub's institutional capacity building activities.

Consistent access and performance of the BecA-ILRI Hub on core systematized[19] institutional capacity building activities, which include fellowships and training seminars

Most institutional respondents interact with the BecA-ILRI Hub via the fellowship (61%) or the training workshops (67%). These correlate strongly with the stated top 3 benefits that institutions gain from the ABCF program (second and third listed). There is also a strong unmet need in this area with 28% and 22% of institutions stating that additional fellowships and additional technical assistance workshops are key areas of opportunity (see Figure 16 below).

Figure 16: ABCF service offerings accessed by home institutions

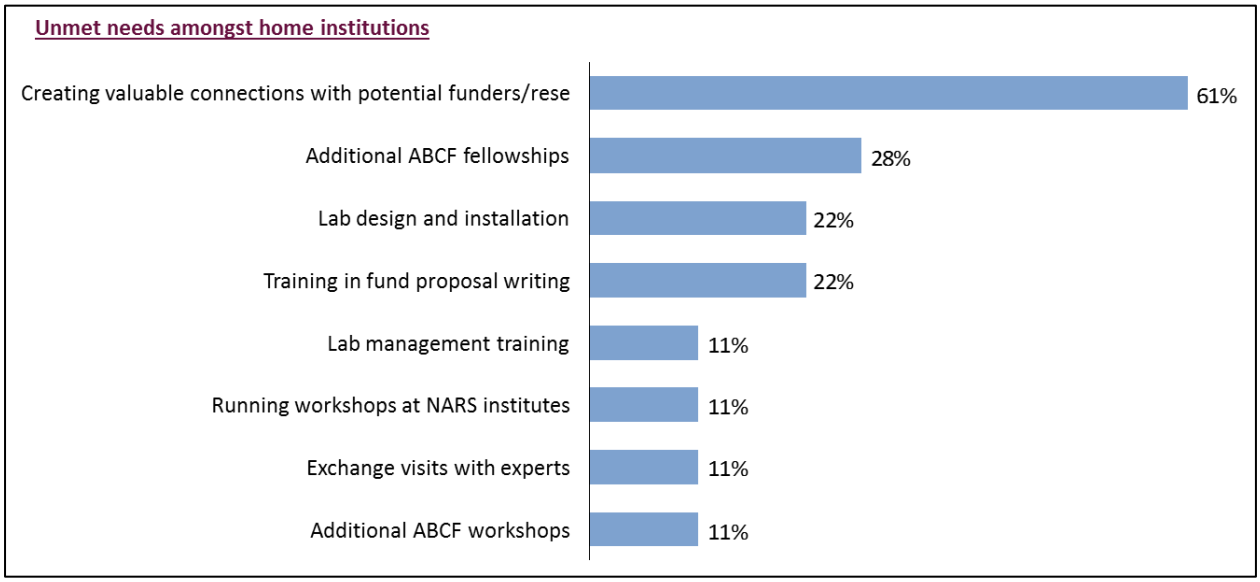


High performance but inconsistent reach on non-systematized[20] institutional capacity building activities, which include technical support/advisory services, advocacy, and awareness

[19] Systemized activities: core ABCF capacity-building activities offered on a regular basis

Only 50% of responding home institutions access broader non-systematised ABCF capacity building "advisory services" such as funding support[21], and network expansion, advocacy and in kind contributions, though they are highlighted as top 3 benefits. This is supported through interviews with home institutions citing where these services have been accessed they have been highly valued. Consequently, there is high potential to increase impact by broadening the reach of these activities to other home institutions. This gap is supported by the data on unmet need where "creating valuable connections with funders…" and "training in fund proposal writing…" garner 83% of responses.

Figure 17: Highest unmet needs amongst home institutions



Furthermore, concerning the BecA-ILRI Hub's performance as an advocacy partner on average 91% of respondents state the BecA-ILRI Hub is either "good" or "very good" at increasing the reach and awareness of bio-sciences as well as promoting career development opportunities. However, just 69% say the same for the BecA-ILRI Hub's ability to "create connections with funders" and "access influential networks."

Key opportunities to increase ABCF performance and impact

When we look across individual and institutional stakeholders and asked the critical improvements they would like to see the ABCF adopt in order to maximise its impact, increasing the number of fellowships and connecting home institutions to key donors were the top 2 highest ranked across all external stakeholder groups.

[20] Non-systemized activities: ABCF capacity building activities that are tailored to the specific needs of an institutions; offered on a need-by-need basis

[21] The BecA-ILRI Hub currently only provides funding only if engaged in collaborative projects with NARS

Figure 18: Key improvements to the ABCF to maximize impact

Improvements to ABCF to maximize its impact	Alumni	Fellows	Workshop Participants	Home Institutions	Research Staff**	Non-research Staff**	RANKING
Increase number of fellowships offered per year							1
Connect home institutions with key donors and provide input into funding proposals							2
Provide consultative input to home institutions on their lab design and management							3
Promote exchange visits with experts and leading scientists							4
Increase advocacy and awareness of key food security and agricultural research findings in the region							5
Increase the number of workshops held by BecA-ILRI at home institutions in the region							6
Increase number of workshops held at BecA-ILRI							7

Key: Top 2 options; All other options; Bottom 2 options

** Includes BecA-ILRI and extended faculty staff

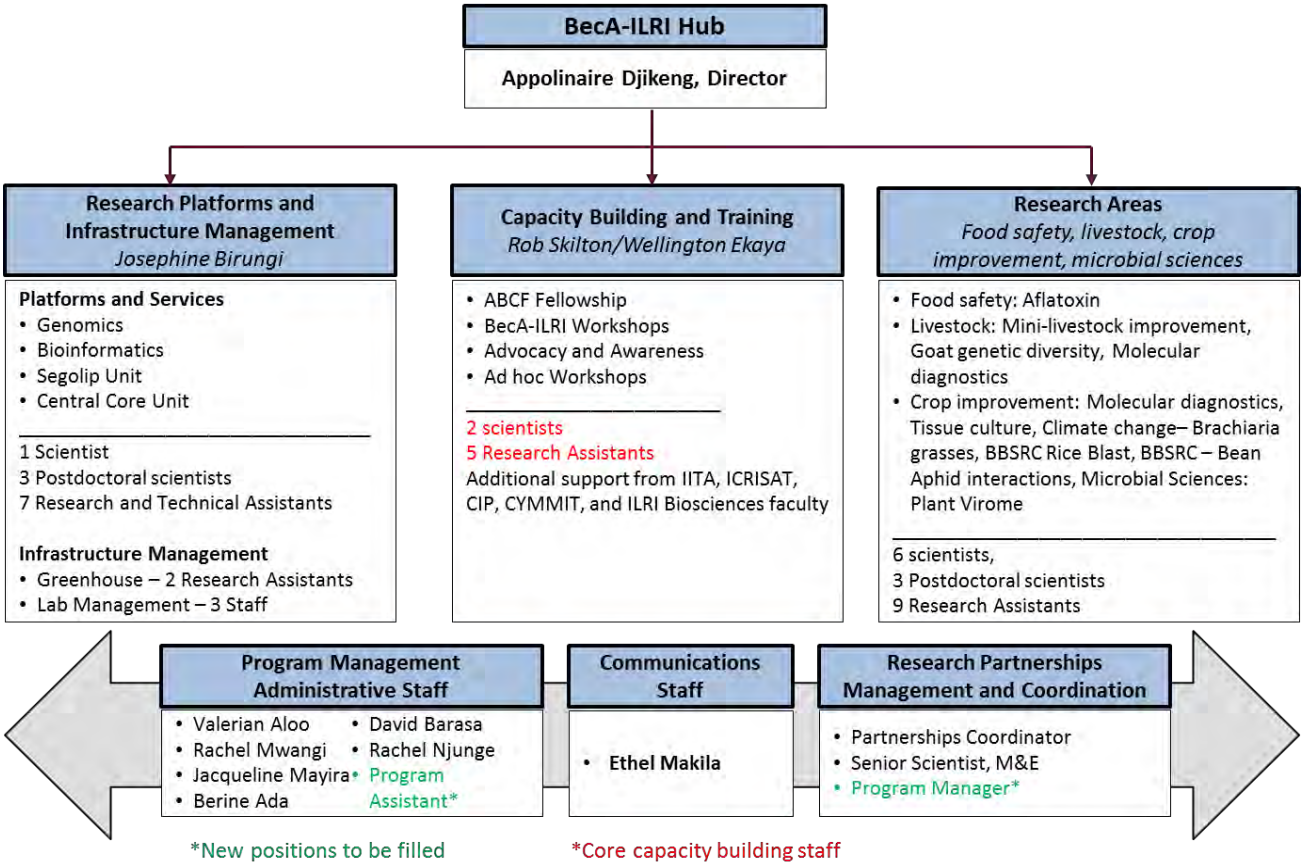
4.3. Performance of the BecA-ILRI Hub's internal operations

We further assess the delivery of ABCF services from the BecA-ILRI Hub by mapping the internal actors and their responsibilities then incorporating feedback from respondents in the areas of resource quality, sufficiency, and operational efficiency. This reflects the strengths and gaps that are increasingly important given the anticipated growth in the program over the next five years. Finally, the online survey and interview respondent group for this section is no longer solely focused on external stakeholders but also incorporates internal research and non-research staff.

Mapping

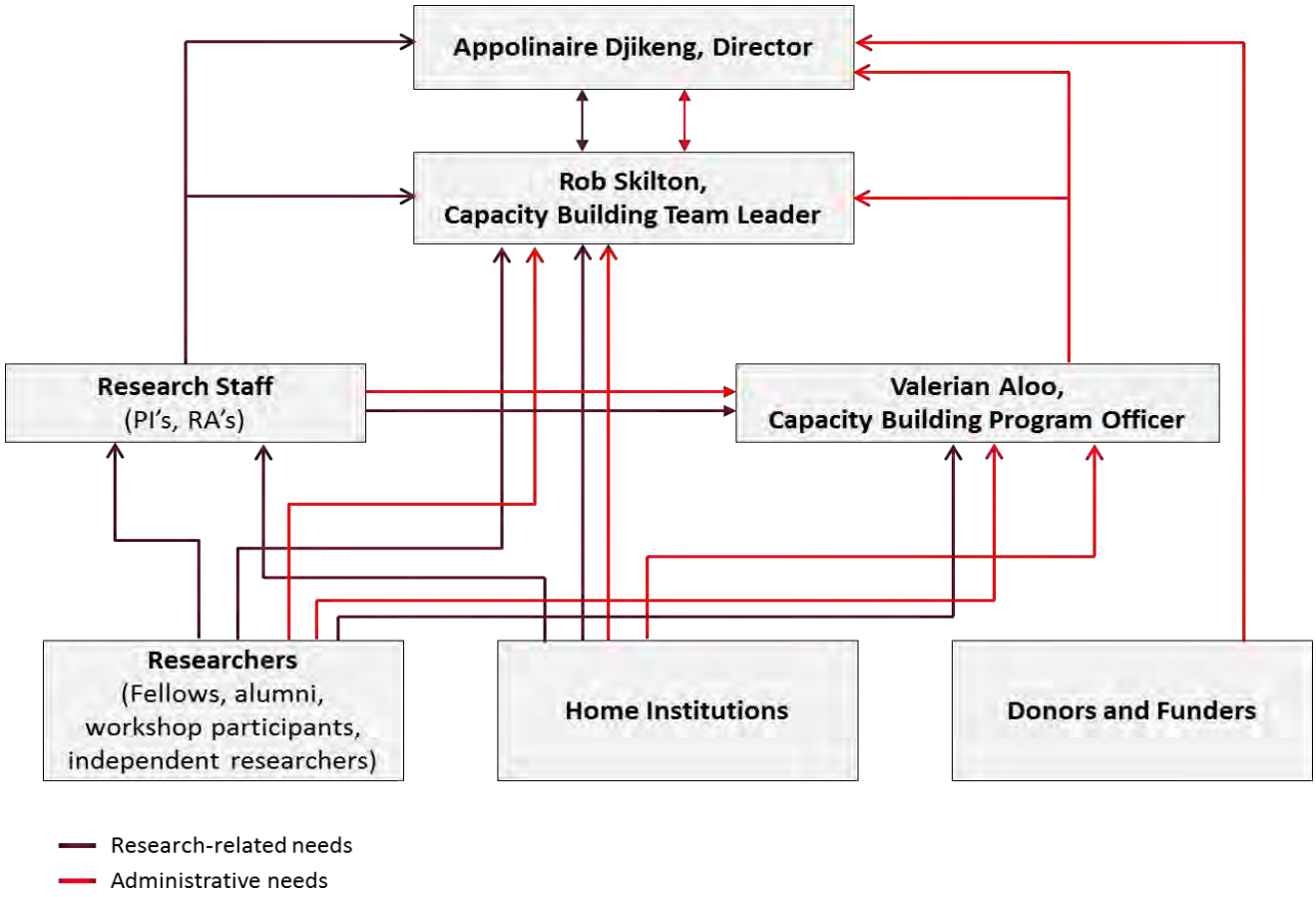
The following is an up-to-date view of the organizational map of the BecA-ILRI Hub, including the Capacity Building unit, which interacts significantly with several other operational teams.

Figure 19: The BecA-ILRI Hub organization chart (The BecA-ILRI Hub Business Plan 2013 – 2014)



From evaluation interviews, our understanding of the operational structure of the BecA-ILRI Hub is that it is decentralized based on research staff teams (Senior Scientists, Research Assistants, and Technicians) working with visiting scientists either through established Research Areas (i.e. Aflatoxin) or more individually-focused projects. Although all the BecA-ILRI Hub staff are involved in capacity building activities, the Capacity Building and Training team is the nucleus of all these activities. Consequently, currently within the Capacity Building unit we see the following stakeholder interactions and information flows:

Figure 20: ABCF internal communications



Quality and sufficiency of management performance

One key conclusion across stakeholder groups, including donors, is on the strong performance and leadership of the core management team. In particular, their passion, commitment, and role modelling for younger scientists on owning personal work have been cited as strong attributes of the non-research staff. These achievements are also seen as responsible for successfully building the BecA-ILRI Hub to its current position. However, we also understand that there are key pressure points in the organization concerning research and administrative information flows that are unsustainable with future growth.

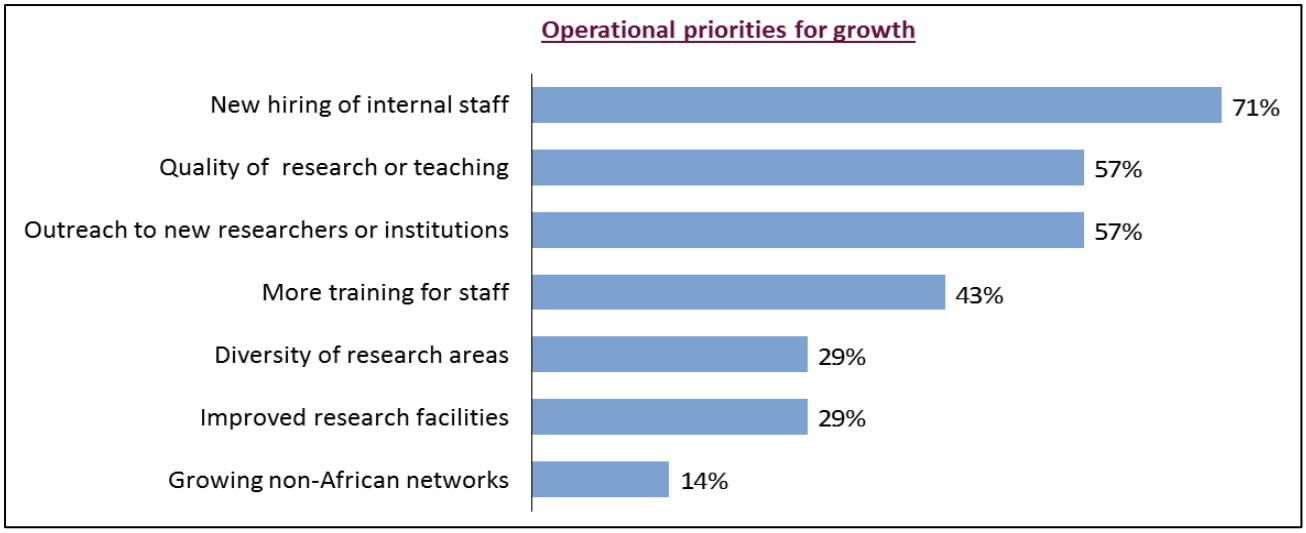
Quality and sufficiency of broader resources

According to staff survey results (the BecA-ILRI Hub staff and extended faculty), the "availability…" and "training…" of administrative and management staff" are given "poor" or "very poor" marks (14%). As illustrated in the above diagram, the Capacity Building Program Officer is currently the focus for all logistic responsibilities of ABCF activities from coordinating fellow's on-boarding to day-to-day outreach. Similarly, as problems escalate and the Capacity Building Team Leader and Hub Director get involved they are forced to then manage administrative, outreach, funding, and managerial decision making all at once.

Furthermore, in interviews all research staff reference the large amount of time that senior scientists spend on administrative tasks due to non-research staff time constraints. In particular, 25% of research staff respondents to our survey spend 50% or more time on these activities (see Appendix C). As mentioned, these often result in less time for personal research or mentoring visiting researchers. Given that the BecA-ILRI Hub management also retain research supervisor responsibilities increasing the number and refining the

responsibilities of all staff is a priority area of improvement with more growth on the horizon. Our findings from the survey with the BecA-ILRI Hub staff (see Figure 21 below) confirm these concerns, with 71% of staff agreeing that hiring of new internal staff is a key priority if the ABCF is to expand its reach and scope of capacity building activities.

Figure 21: Operational priorities for growth as indicated by the BecA-ILRI Hub staff



Under the growth assumptions and targets outlined in the BecA-ILRI Hub Business Plan 2013-2018, there is also a concern regarding the very high utilisation and demand on key operations staff, which may be unsustainable. Currently 13 program staff are supporting 124 fellows, 471 workshop participants and 76 Group 1 institutional partners. This is also reflected at the management level where there is a broad and demanding mix of responsibilities, which are often a direct trade-off, i.e. management/operational responsibilities vs. mentoring and research related work.

Finally, there is an issue with ICT facilities for internal, non-research operations as 29% of respondents gave "poor" or "very poor" marks. In interviews the only major non-research technological obstacle mentioned was non-research staff access to the ABCF fellowship application system. However, to our knowledge a new system is in place that is of higher quality. The issue of ICT facility troubleshooting is an area that requires further exploration from the BecA-ILRI Hub management.

Effectiveness of stakeholder communications

In discussions with the BecA-ILRI Hub Capacity Building and Training team we are able to show a matrix of various methods by which topics are sent to and received from stakeholders. In the visual representation below there are three key segments of communication: reactive, proactive – mass, and proactive-targeted communication. Each of these activities are carried out through one of four main avenues: email, the BecA-ILRI Hub website, Facebook, or phone.

Figure 22: ABCF communication mechanisms[22]

ABCF communication methods						
	Reactive - targeted	Proactive – mass communication				Proactive – targeted
Stakeholder group	Incoming requests	Newsletter	Jobs and fellowship opportunities	Publication opportunities	Conferences and events	Research collaboration opportunities
ABCF fellows	✓	✓	✓	✓	✓	✓
Workshop participants	✓	✓	✓	✓	✓	✓
Externally funded researchers	✓	✓	✓		✓	✓
Home institutions	✓	✓	✓		✓	✓
Staff – research	✓	✓	✓	✓	✓	✓
Staff – non research	✓	✓	✓		✓	
Donors	✓	✓	✓		✓	✓

From interviews with stakeholders there are two key conclusions: First, word of mouth is very important in raising awareness of the BecA-ILRI Hub and ABCF program. According to fellows and workshop participants they were most likely to first hear of the BecA-ILRI Hub from former workshop participants (19%), home institutions (17%), supervisors (17%), or colleagues (16%). Furthermore, according to home institutions on average 85% of their departmental, institutional, and peer colleagues are "very" or "moderately" aware of the BecA-ILRI Hub's existence.

Second, in interviews with institutions and alumni – those most likely to be supervisors or colleagues mentioned above – none cited any consistent proactive outreach concerning fellowship application preparation, alumni networking, or career opportunities which they would like to see. Therefore while Hub communication may be strong with directly engaged stakeholders (fellows, Group 1 home institutions), there may be an opportunity to increase awareness and engagement with alumni, participants that have attended workshops in the past, and broader stakeholders within national and regional institutes.

This could also be reflected in the fact that while several workshop participants have gone on to become ABCF fellows (51 in total) only one has gone on to become an externally funded researcher. This dissonance presents an area of opportunity.

Sufficiency of Key Performance Indicators (KPIs) and Monitoring and Evaluation (M&E)

To date the management of the BecA-ILRI Hub have acknowledged that assigning and monitoring KPIs through effective monitoring and evaluation has been a missing operational focus. This was brought to the BecA-ILRI Hub's attention by the *CSIRO Midterm Review (2012),* which highlighted the need to hire an M&E scientist. As of January 2014, this position has been filled. There has been a renewed focus on measuring performance in the areas found in Appendix C.

[22] This matrix was developed in concert with the BecA-ILRI capacity building team – in-person - and is based on staff experience

Key operational risks and dependencies

The evaluation has highlighted several major achievements of the ABCF program over the past three years. However, there are two key operational risks and dependencies, which have come across throughout stakeholder interviews: these involve institutionalizing internal knowledge transfer via a succession plan, as well as retaining and attracting senior research staff and management.

As seen in our analysis of internal management structures, outreach, and information flows there are three key individuals (Hub Director, Capacity Building Team Leader, and Capacity Building Officer) who are increasingly relied upon to conduct ABCF-related research, administrative, managerial, and outreach activities. While interviewees have lauded their commitment to the program, this dependency is a structural risk to the growth and sustainability.

A similar issue also applies to the critical role that senior researchers play in the BecA-ILRI Hub as mentors, scientists, managers, and ABCF-participant recruiters. Each senior scientist brings a unique set of skills, mentorship abilities, and networking linkages that cannot be replicated but are required to reach and maintain any growth in the number of visiting researchers. In order to retain and recruit these actors, systematizing mentorship requirements and periods, identifying common topics of training, and constructing a value proposition for senior scientists are important immediate actions.

4.4. Financial sustainability

Three core tenets of the BecA-ILRI Hub's strategy and business plan for 2013-2018 are:

- **Increasing access** to the BecA-ILRI Hub's facilities for African scientists and students,
- **Ensuring affordability** of the BecA-ILRI Hub for Africa's scientific community, including expanding the ABCF and seeking new sources of program support for capacity strengthening from African governments and regional programs such as ASARECA and AWARD,
- **Achieving financial sustainability**, by being able to cover all its annual fixed costs on a full cost recovery basis, as well as having a fund to invest in upgrading of equipment and facilities.

As outlined in the BecA-ILRI Hub's business plan for 2013-2018 the strategy for achieving financial sustainability is based on securing: (i) funding to support the BecA-ILRI Hub's core operational costs, (ii) funding to support ABCF capacity building activities (fellowships, workshops, institutional capacity building, and advocacy and awareness raising) (iii) income generated through externally funded researchers, donor research projects, and NARS scientists that pay to use the BecA-ILRI Hub's facilities and services.

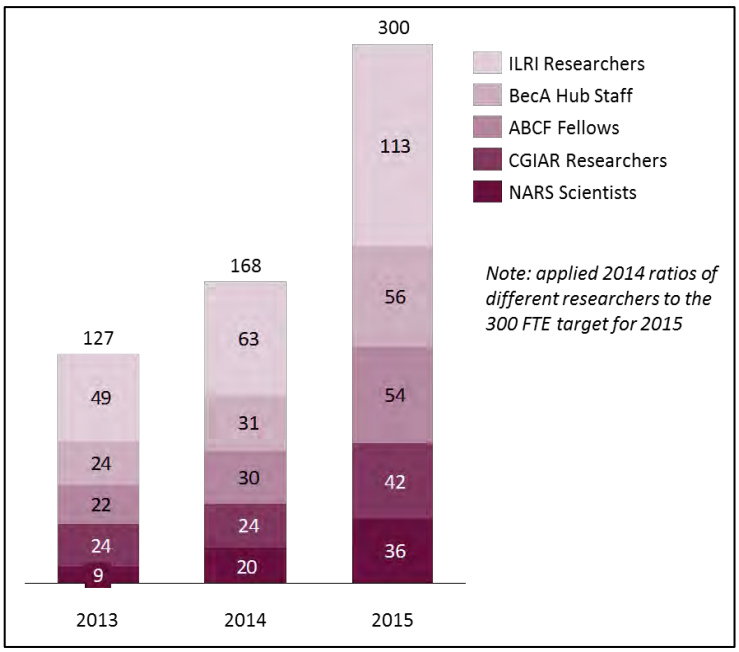
The BecA-ILRI Hub and ABCF's reputation, performance and unique offering are a source of long-term strength in attracting funding and income

The BecA-ILRI Hub's world-class biosciences facilities, research and capacity building activities are unique within the region, and are not easily replicated due to the high associated start up and fixed costs. Furthermore, from interviews there is strong demand for these facilities and services and this is expected to grow further as biosciences human capital and activities expand within the region. This is a source of long-term strength in attracting donor funding to support the BecA-ILRI Hub operations and services, as well as attracting fee-paying scientists, research projects, and NARS. On this basis it is also critical that sufficient budget is allocated to the capital fund for maintenance and updating of the BecA-ILRI Hub's laboratory facilities and equipment.

The growth target of 300 FTE researchers/scientists per annum by end 2015 is highly aggressive

A key target for achieving financial sustainability outlined in the business plan is a scaling up of Hub researchers and scientists from a planned 168 hosted FTE per annum in 2014 to 300 hosted FTE per annum by end 2015. This would achieve maximum utilization of the BecA-ILRI Hub's available facilities and create greater financial sustainability by reducing the dependency on donor funding for core Hub operations.

Figure 23: BecA-ILRI Target Hub users (Business Plan 2013-18)



However, the BecA-ILRI Hub's ability to sufficiently increase ABCF fellows, Hub staff and externally funded NARS scientists within this timeframe is aggressive given the current volume achieved, and in the context of senior scientist staffing constraints and a desire to maintain high AR4D quality. It is important to note that the responsibility to increase the bench users is not exclusively to the Hub but to ILRI and other hosted organizations as well.

The targeted growth in the ABCF fellowship program would require c. $3.5m of incremental donor funding per annum, which is currently not secured

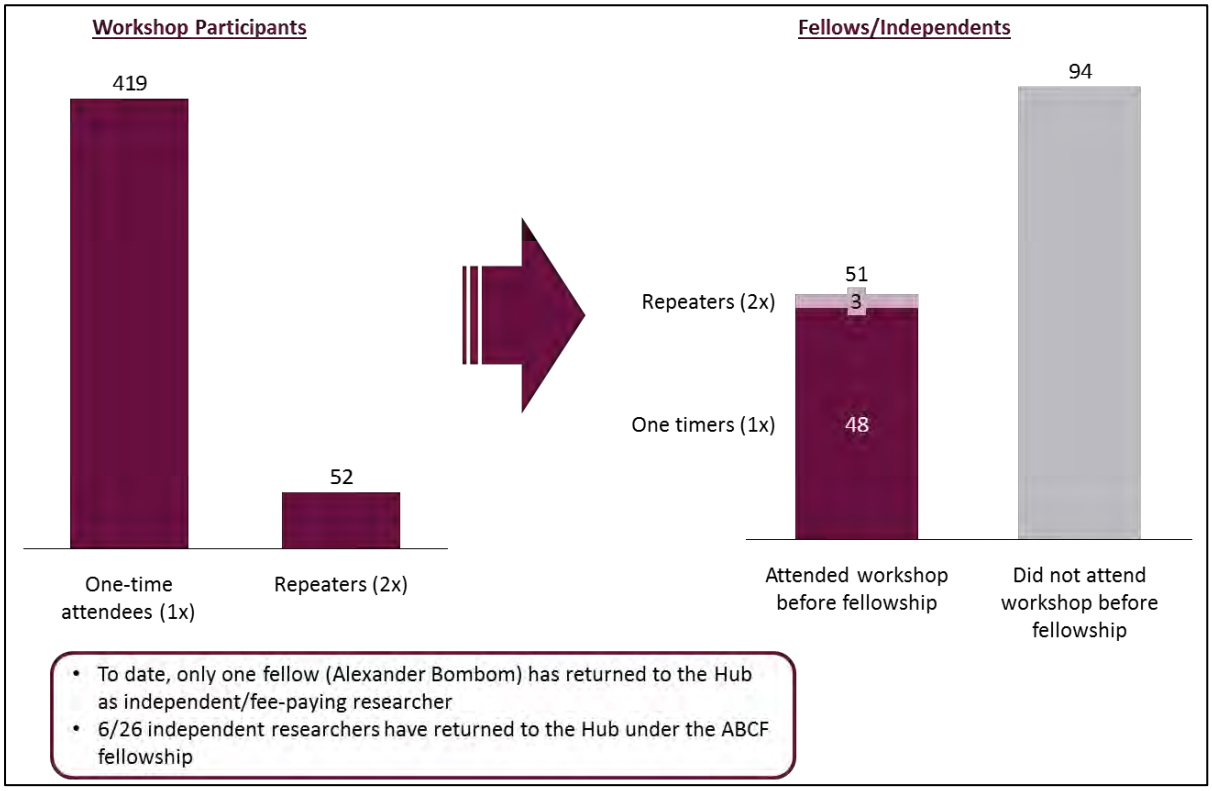
The ABCF program will support 30 FTE fellows in 2014, which would need to grow to c.56 FTE to contribute its share of the 300 FTE target (based on existing ratios). This would require an 80% growth in fellowships and an incremental $3.5m of funding per annum for the ABCF fellowship (given $142K cost per FTE per annum). It would also require an increase in budget and funding for the BecA-ILRI Hub's core operations. This level of incremental growth is not currently incorporated into the BecA-ILRI Hub and ABCF's budget and secured pipeline of funding for 2015.

The ability to attract an increase in fee externally funded NARS scientists is a significant dependency towards financial sustainability

In addition, the scaling up of fee-paying NARS scientists will contribute to the financial sustainability of the BecA-ILRI Hub (as it increases the amount of non-donor funded income). However the growth required may be aggressive given performance achieved to date (9 FTE NARS scientists in 2013). One opportunity is to increase Hub engagement with potential externally funded NARS scientists and build the BecA-ILRI Hub facilities and cost assumptions into their research and donor proposals early, to ensure they are in a position to pay the relevant Hub fees. Another opportunity is for the BecA-ILRI Hub to better target and attract CG supported research programs that are dependent on high-end biosciences facilities, and have budget allocated to pay for these resources.

Another source of fee-paying researchers mentioned in stakeholder interviews is through the pipeline of fellow alumni and workshop participants who could return to the BecA-ILRI Hub on a fee-paying basis. Interestingly, our analysis shows that to date no fellows, alumni or workshop participants have returned to the BecA-ILRI Hub on a fee-paying basis. This is another opportunity for exploration.

Figure 24: Outline of the "origin" of ABCF fellows



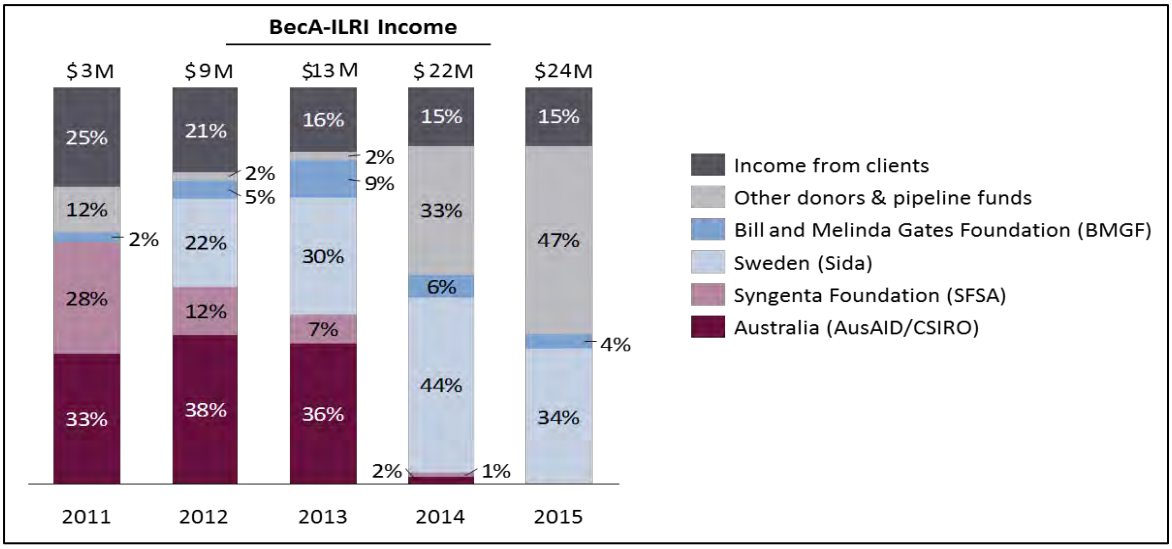
The BecA-ILRI Hub's management and operations capacity is currently not resourced to support significant growth

Growth in the capacity building activities of the ABCF and Hub would need to be supported by an increase in the budget and core operations, which is in turn dependent on securing additional donor support. Whilst additional resources have been added to the team, this may not be sufficient in the context of the growth outlined in the business plan.

There is significant dependency on a small number of international donors to support the BecA-ILRI Hub's core operations and the ABCF's capacity building activities.

Five donors (CSIRO, AusAID, SIDA, BMGF, and Syngenta Foundation) have been instrumental in the inception and growth of the BecA-ILRI Hub and ABCF program and have collectively contributed c. $19 million over the past three years (2011 – 2013). They continue to provide critical financial support, and make up just under 80% of total income required per annum. Whilst this funding is not at risk in 2014 and 2015, it will be important for the longer-term financial sustainability of the BecA-ILRI Hub to increase the number and mix of donors.

Figure 25: The BecA-ILRI Hub's required funds (Business Plan 2013 -2018)



Summary of performance evaluation of ABCF capacity building activities

Key Strengths

- **Very strong endorsement across ABCF key stakeholders of the BecA-ILRI Hub's delivery against mission** objectives. Over 90% of stakeholders state that the BecA-ILRI Hub promotes access to world-class research and training facilities, builds the capacity of individuals and institutions to harness latest biosciences technologies and development of cutting edge research.

Service offering:

- **Very strong usage, relevance and quality performance of the BecA-ILRI Hub's capacity building activities** and service offering amongst both individuals and institutions. Witnessed with 75%+ of fellows accessing all the services and facilities available, 80%+ rating these as either "good" or "excellent", and 90% of workshop participants rating all aspects of the workshops either "good" or "excellent." In particular, lab materials-facilities are the most accessed and highest rated services provided within the fellowship.
- **At an institutional level, there is greater diversity in which services are accessed across home institution partners.** Training seminars and fellowships are the two capacity building services accessed the most, and both ranked within the top 3 most beneficial from a home institution perspective. This remains the bedrock of their capacity building activities with institutions.

Internal operations:

- **The ABCF core team and management structure have demonstrated very strong performance.** Across stakeholder groups their passion, commitment, and role modelling for younger scientists and in building the ABCF program over the past 3 years.

Development Needs

- **Clear opportunities to expand reach of institutional capacity building activities.** The BecA-ILRI Hub's support to home institutions on funding access and networks is important with 50% of the

surveyed home institutions accessing these today. The BecA-ILRI Hub's support for home institutions funding activities in particular was ranked within the top 3 most beneficial service offering by 72% of surveyed home institutions. In addition, 61% of home institutions surveyed highlighted "creation of valuable connections with funders and implementers" as an unmet need. Lastly, 28% of surveyed home institutions stated they are keen to see more fellowships offered, 22% are keen to have support from the BecA-ILRI Hub on lab design and management and 22% stated they would like support on fund proposal writing. These numbers are likely to be a very conservative estimate of actual demand from home institutions in the region, as they are based on the home institutes who completed the survey (80% of whom are from strong NARS and already receive a higher degree of support from the ABCF than the total average population).

- **The financial sustainability of the ABCF and Hub needs to be strengthened** particularly in the context of the growth outlined in the BecA-ILRI Hub's business plan for 2013-2018. Actions taken will need to include increasing the number and mix of donors as well as increasing the number of externally funded scientists, researchers and program's.
- **Individual stakeholder's activities could be further strengthened across cohorts to reinforce systematic mentoring and peer networking activities**. The importance of role modelling and mentorship is key in the day-to-day research of researchers but these networks – as well peer connections – are not formally reinforced outside of weekly progress report meetings.
- **ABCF communications and awareness raising activities are mainly focused on existing stakeholders with whom the BecA-ILRI Hub is actively engaged (Group 1 home institutions, existing fellows, and existing workshop participants).** There is opportunity to expand awareness and reach of the BecA-ILRI Hub and ABCF program through continued outreach and communication with individuals, once they've completed their fellowship/workshop, as well as expand communication to relevant home institutions in the region.
- **All staff reference the significant amount of time that senior researchers spend on administrative tasks due to non-research staff time constraints.** In particular, 25% of research staff respondents to our survey spend 50% or more time on these activities. These often result in less time for personal research or mentoring.
- **Development of KPI's, targets and monitoring and evaluation is a critical operational gap.** This has started to be addressed through the M&E scientist hiring, however this needs to be rapidly supported by clear KPI's and targets on how to assess performance.
- **There are key risks in lack of institutionalized knowledge transfer and succession planning for key management, as well as retaining and attracting senior research staff**. As seen in our analysis of internal management structures, outreach, and information flows there is very significant dependency on two-three key individuals who are increasingly relied upon to conduct the vast majority of leadership, management and operations of the ABCF. This poses longer term operational sustainability risks. This also applies to the critical role of senior researchers whose skill sets, mentorship abilities, and networking linkages cannot be replicated but are required to reach and maintain any growth in the number of visiting researchers.

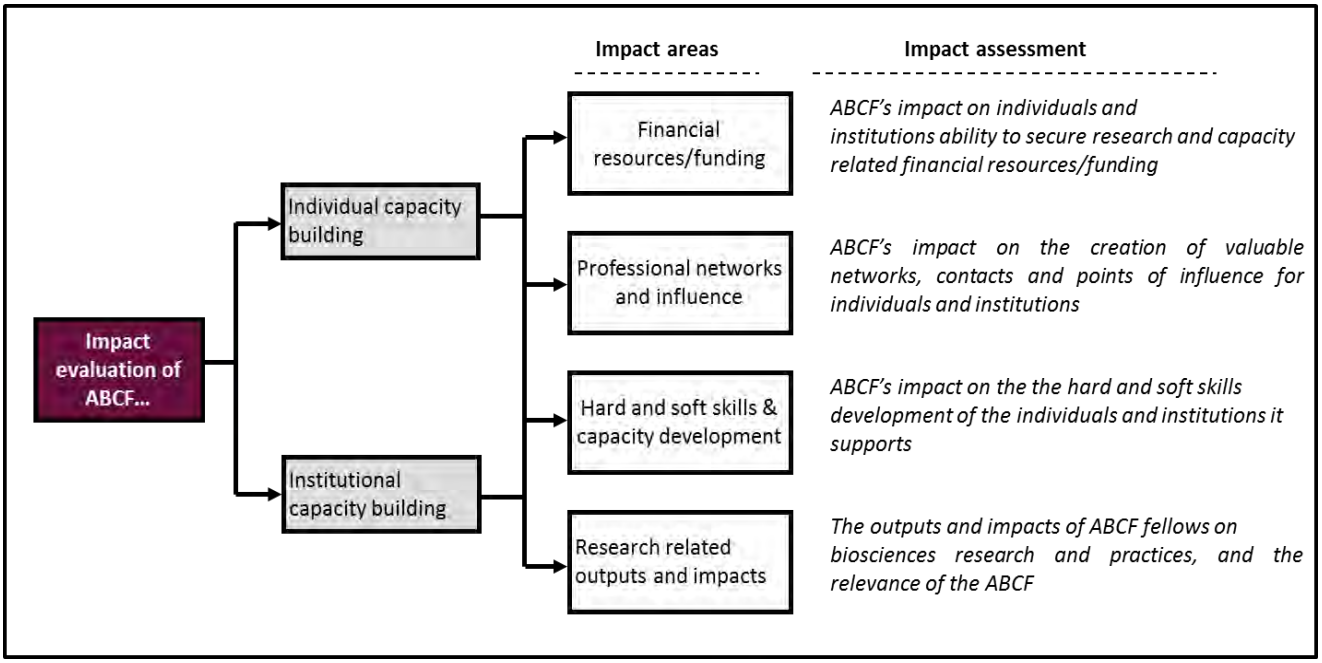
5. Assessing the impact of the ABCF on capacity building in the region

Evaluation objective and our approach including framework

When evaluating the impact of the BecA-ILRI Hub's capacity building efforts in the region, we have assessed the impact on both capacity building of individual researchers' and home institutions across four key dimensions:

1. Research or capacity related **financial/funding benefits** that have been secured by individual and institutions, and attributed to the contribution of the ABCF and Hub.
2. **Individual and institutional network and influence benefits** acquired through their relationship to the ABCF and Hub.
3. **Hard and soft skills and capacity development** of individual and home institutions attributed to their engagement with the ABCF and Hub.
4. The impact of ABCF funded researchers on **developments and improvements in agriculture and food security in the region** (including policy changes, practices etc.).

Figure 26: Framework used for assessing impact of the ABCF



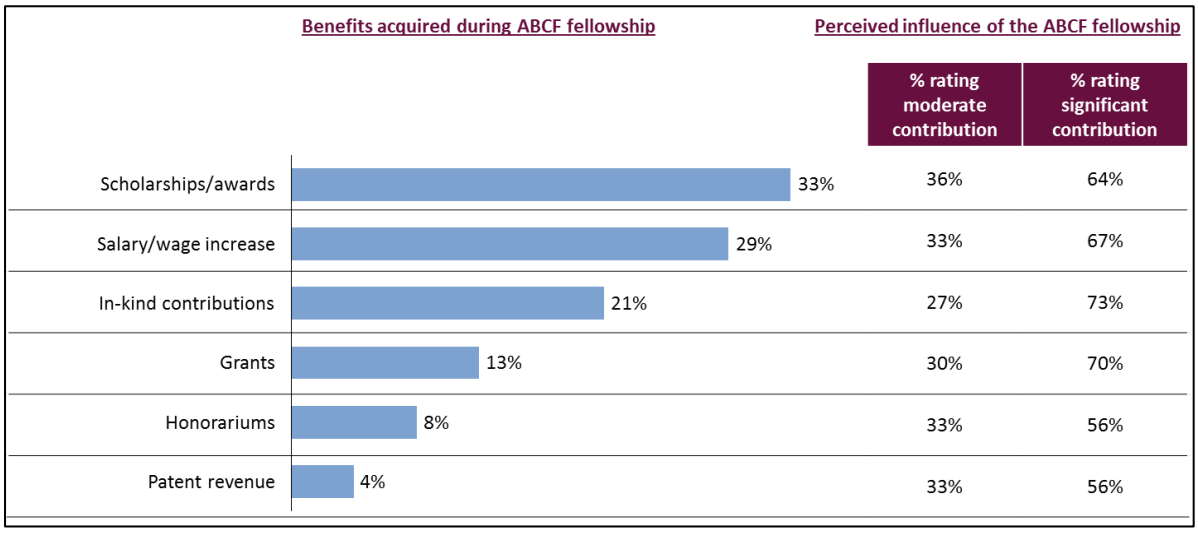
5.1. Financial benefits acquired as a result of the ABCF fellowship

Individual stakeholders

The ABCF has played an important role in enabling individual researchers' to secure research related financial benefits. In fact, c.80% of all current fellows have secured at least one financial benefit. Scholarships and awards related to their research was the most frequently secured benefit, achieved by 33% of total respondents, 64% of whom stated that the ABCF fellowship had made a significant contribution to them securing this (see Figure 27 below). On average, c. 70% of current fellows stated that the ABCF fellowship has had a moderate to significant contribution in acquiring these benefits.

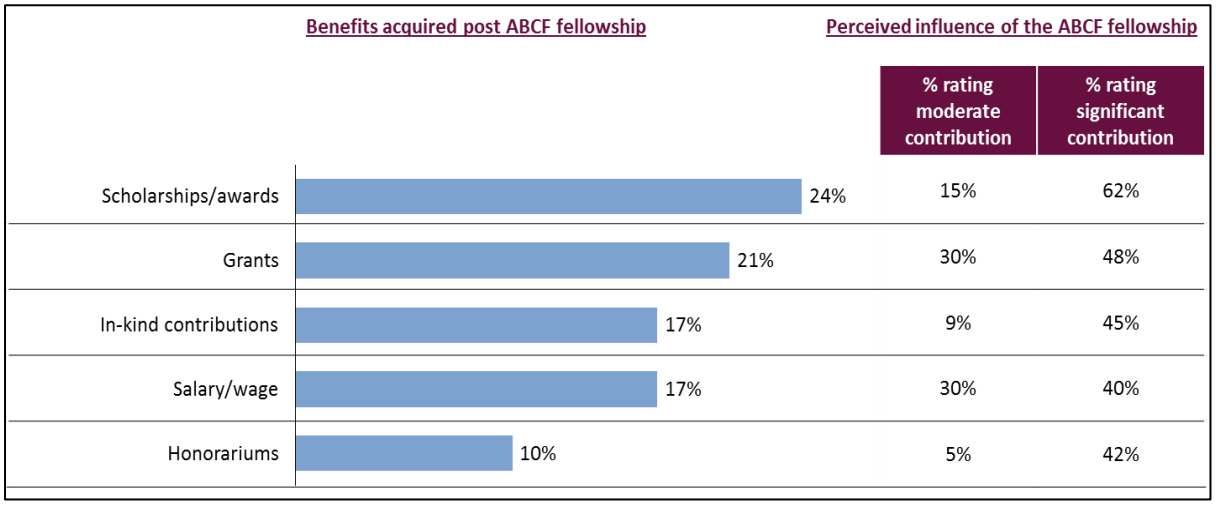
However, it is important to note that we see a relatively low penetration in the number of fellows that have secured these benefits (less than 40% of fellows across all).

Figure 27: Financial benefits acquired by current fellows



Similar to current fellows, c. 80% of alumni have received at least one financial benefit post the ABCF fellowship (c. 20% have received more than one more benefit). Scholarship and awards are yet again the most common benefit received (see Figure 28 below). Contrary to current fellows, less than 40% of alumni have attributed these benefits to the ABCF fellowship. This is not surprising given currently the ABCF does not proactively engage with its alumni on any programs following their time at the BecA-ILRI Hub as fellows.

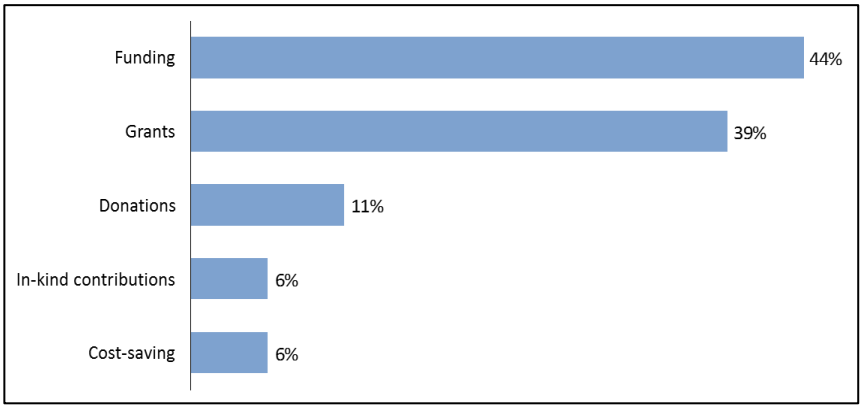
Figure 28: Financial benefits acquired by ABCF alumni post ABCF fellowship



Home institutions

The BecA-ILRI Hub has successfully contributed to c. 40% of home institutions receiving funding and grants to further biosciences within the region. In fact, 80% of all home institutions we surveyed have received at least one financial benefit, with c. 35% receiving two or more benefits.

Figure 29: Financial benefits acquired by home institutions



Given the BecA-ILRI Hub's extensive network, there is an opportunity for the BecA-ILRI Hub to further enable institutions to access in-kind contributions from its network; currently only 6% of home institutions surveyed have leveraged the BecA-ILRI Hub to receive in-kind contributions from the BecA-ILRI Hub's connections. Additionally the BecA-ILRI Hub can engage institutions in best practices to save on costs in running their facilities, thus utilizing the BecA-ILRI Hub's in-house expertise in lab management practices to further build institutional capacity.

5.2. Skills and capacity development

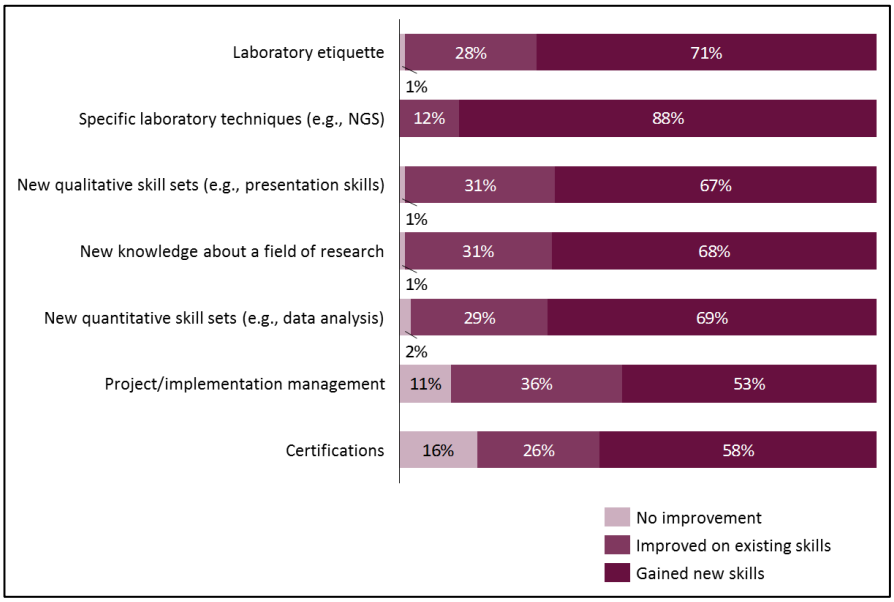
Individual stakeholders

Building capacity of scientists is the key mandate of the ABCF; consequently, a measurement of the hard and soft skills is an important indicator of the success of the ABCF program.

Hard Skills

The majority of all fellows (>90%) indicated they have either improved on existing skills or gained new skills that are directly related to their research. They indicated the top skills acquired as a result of the fellowship being laboratory techniques (e.g., Next Generation Sequencing) and laboratory etiquette.

Figure 30: Impact of the ABCF on fellows' hard skills



Project implementation remains a key area of development that is particularly important further down the impact pathway in allowing fellows to complete their research and translating research findings into field application.

Additionally, project management is a key unmet need given 45% of all alumni did not identify and discuss external risks related to their project; consequently 60% of them did not complete all their project milestones within the allocated fellowship time frame.

Workshops participants gave similar insights regarding the impact of the BecA-ILRI Hub workshops in developing hard skills. Majority (c. 98%) of them improved upon existing skills or learnt new skills at the workshops and indicated that scientific research writing and proposal-writing skills were their biggest learning's from the workshops.

Soft Skills

One of the key emerging themes in our discussions with fellows regarding their ABCF experience was the significant impact the fellowship had in building their soft skills. The Friday progress-report sessions[23] were highlighted as driving development of presentation skills and problem-solving skills, as well as enabling connections between the fellows.

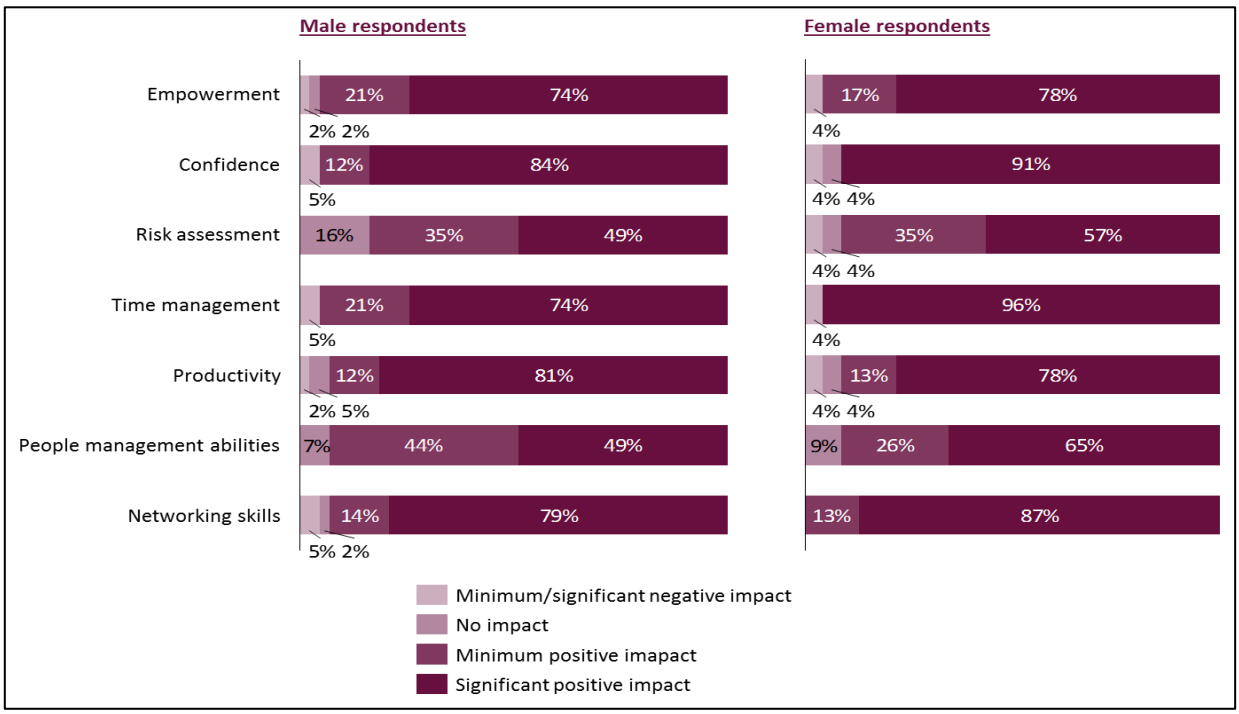
More than 90% of all fellows indicated the fellowship had a positive impact on the following key areas (1) confidence and personal empowerment, (2) project management (as indicated by impact on risk assessment, time management, and productivity), and (3) interpersonal skills (as indicated by people management skills and networking skills).

[23] As part of the fellows' curriculum, each fellow is expected to give a presentation of the project progress every Friday to the entire ABCF Fellowship

Across the genders, we saw a similar impact on soft skills (see Figure 31 below), with the exception of impact on time management and people management skills. Approximately 94% of female fellows indicated a significant improvement on their time management skills, compared to 63% of men. Similarly, 59% of female fellows indicated a significant impact on their people management skills, compared to 40% of men.

These findings were further confirmed by workshops participants, the BecA-ILRI Hub internal research staff,

Figure 31: Impact of the ABCF on fellows' soft skills



and home institutions we surveyed; more than 80% of them indicated that the BecA-ILRI Hub's capacity building activities have had a positive impacts on skills set indicated in Figure 31 above.

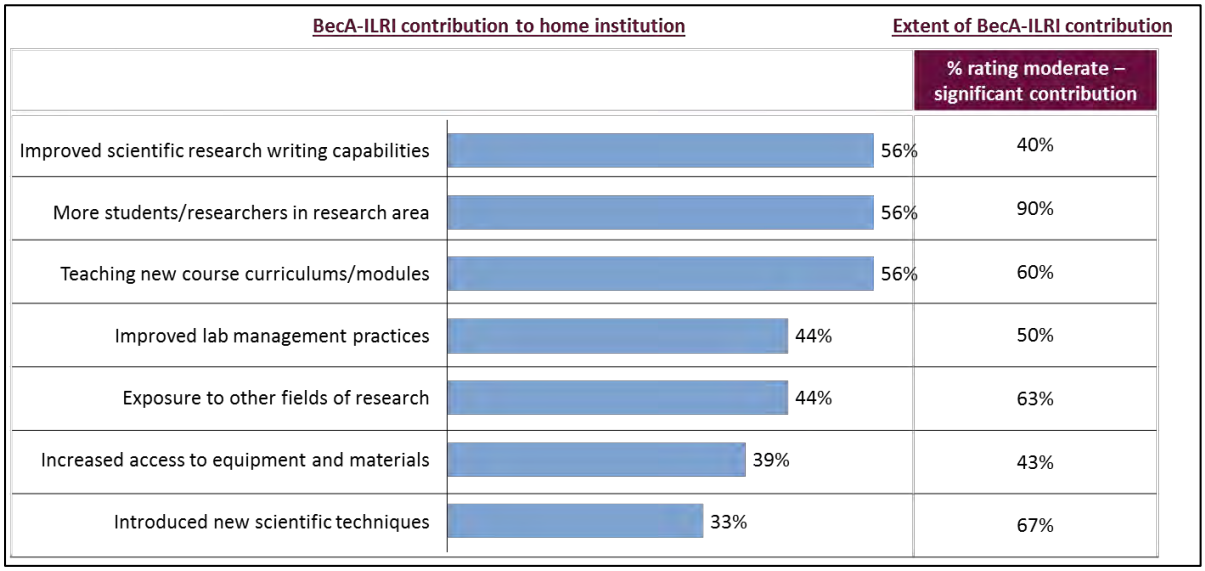
Home Institutions

The impact on biosciences capacity at the home institutions has been two-fold (1) impact through direct the BecA-ILRI Hub engagement with institutions (2) indirect impact through the fellows and workshop participants who come from these institutions.

Direct impact

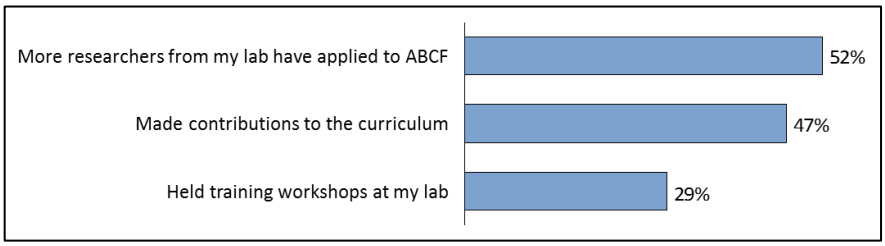
To date, the BecA-ILRI Hub has engaged with home institutions to varying degrees. As shown in Figure 32 below, c.50% of the home institutions surveyed have indicated engagement with the BecA-ILRI Hub in various capacity building activities such as working with established researchers to improve their hard skills (e.g., scientific research writing and lab management). Additionally, of those home institutions that engaged with the BecA-ILRI Hub on these capacity building activities, less than 60% attribute a significant contribution to the BecA-ILRI Hub. In fact, according to home institutions, the most significant role the BecA-ILRI Hub has played is increasing the number of researchers in the region (i.e., c. 90% have directly attributed this increase to the BecA-ILRI Hub).

Figure 32: The BecA-ILRI Hub's service offerings accessed by home institutions



Indirect impact

Figure 33: Impact of ABCF alumni on home institutions



The BecA-ILRI Hub has driven impact in home institutions by engaging individual scientists and researchers through the ABCF fellowships and workshops held at the BecA-ILRI Hub as well as at the home institutions. These individuals have then been instrumental in driving change at their home institutions. To date, c. 67% of home institutions have partnered with the BecA-ILRI Hub to hold training workshops aimed at improving the skills of their researchers. Additionally, ABCF fellows and workshop participants have been able to drive change at the home institutions through various activities such as holding seminars and training workshop seminars which have resulted in more researchers applying for the ABCF fellowship and/or workshops.

However, this impact is limited, with only c. 50% of fellows making direct contributions to their home institutions.

5.3. Networks and Influence

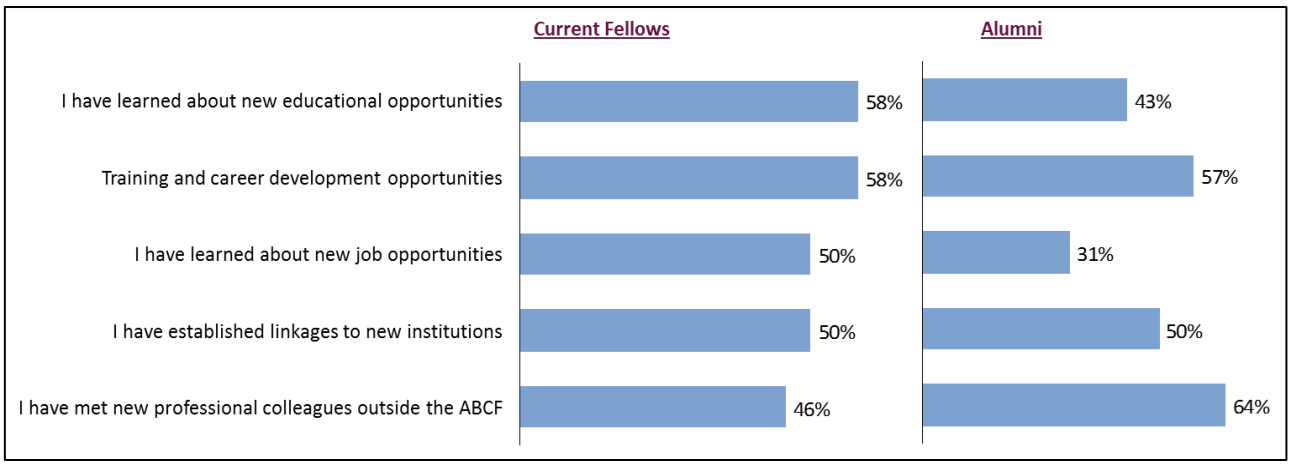
Individual stakeholders

We further assessed ABCF's impact by the effectiveness of the ABCF in generating networks and professional contacts of value and influence that have furthered their research or influenced their career trajectory. All ABCF fellows agree that the fellowship and training seminars/workshops had a positive impact on building their networks through meeting new colleagues and establishing linkages to new institutions. Interviews with fellows and alumni highlighted the high value they placed on the communities of practice that developed as a result their interaction with other fellows in the program. The value of these networks was further confirmed through the surveys, with 50-60% of fellows indicating that they had made valuable

linkages to professional colleagues and new institutions outside of their home institutions (see Figure 34 below).

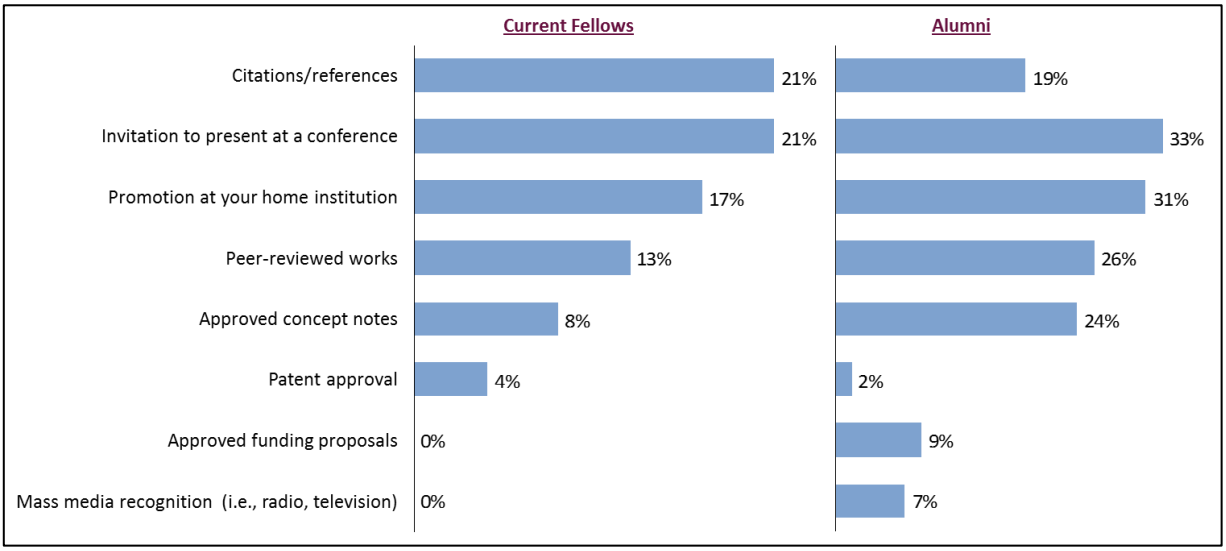
Both current fellows and alumni placed high value on the training and career development opportunities attributed to their engagement with the BecA-ILRI Hub; on aggregate, just over 50% indicated they had learnt about new educational and job opportunities, established linkages to new institutions and met new professional colleagues.

Figure 34: Networking opportunities developed by fellows as a result of engagement with the BecA-ILRI Hub



In addition to networking opportunities, fellows received recognitions following their time at the ABCF fellowship. On average, c. 20% received citations and references, and were invited to present at conferences. A limited number (less than 25%) have received patent and/or concept notes approvals; this is not unexpected given ABCF's engagement with fellows is typically at the beginning stages of their research when researchers are mostly proving and validating research concepts.

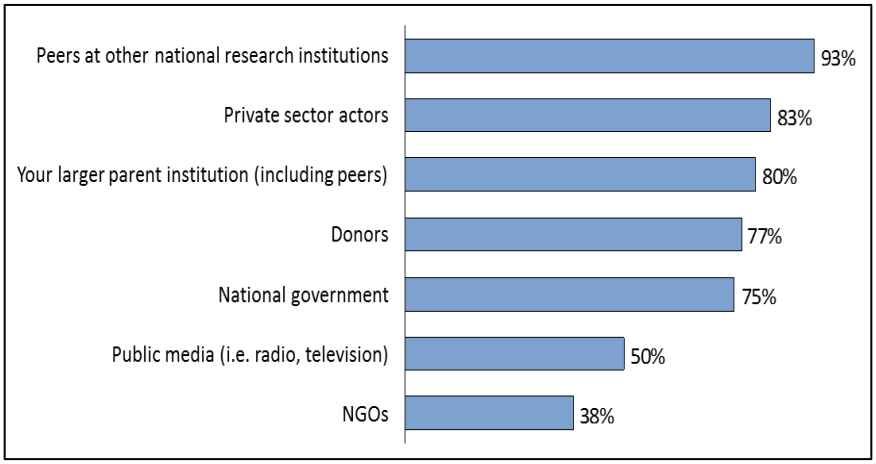
Figure 35: Fellows recognitions and influences as a result of engagement with the BecA-ILRI Hub



Home institutions

The BecA-ILRI Hub has been successful in raising the profile of home institutions in the region. As is evident in Figure 36, more than 75% of respondents indicated that they have gained recognition and influence with peer and parent institutions, in the private and government sectors, and donors. It is important to note that this is based on self-reported feedback from the home institutions, and has not been tested with the peers, private sector actors and donors mentioned, to confirm whether this tally's with their viewpoint.

Figure 36: Networks and influences developed by home institutions as a result of engagement with BecA-ILRI

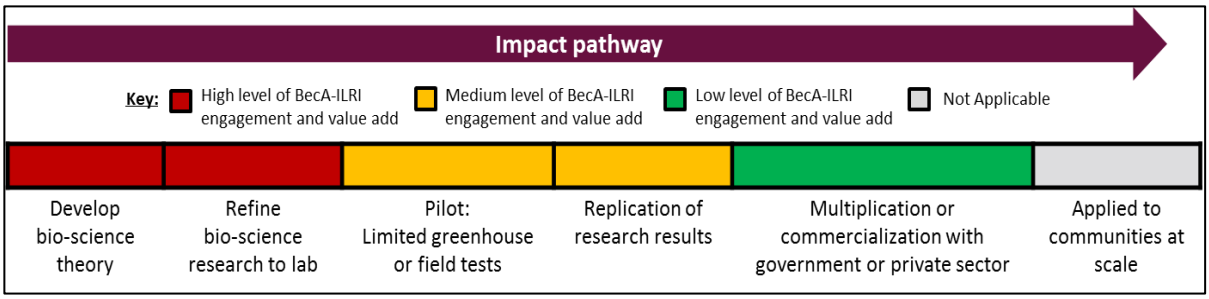


However, there is still limited engagement with non-government organisations (38% engagement), which could potentially play a key role in financing capacity building activities within the region. Additionally, given the important role that the home institutions – in conjunction with the BecA-ILRI Hub – play in the agriculture and food security landscape, it will be important to increase their visibility in the media in order to further the overarching agenda of harnessing innovation to improve food and nutritional security.

5.4. Impact on agriculture, food security and quality

In the AR4D value chain, the focus of the BecA-ILRI Hub and visiting scientists is on the "upstream" theory development to experimental laboratory experience versus "downstream" application in the field and direct impact on end beneficiaries. As the BecA-ILRI Hub moves down the value chain the activities of the ABCF program result in less attribution to direct impact and move to enabling effects. Figure 37 below outlines the impact pathway and the BecA-ILRI Hub's role in actively engaging and adding value to the researcher at each node of the pathway.

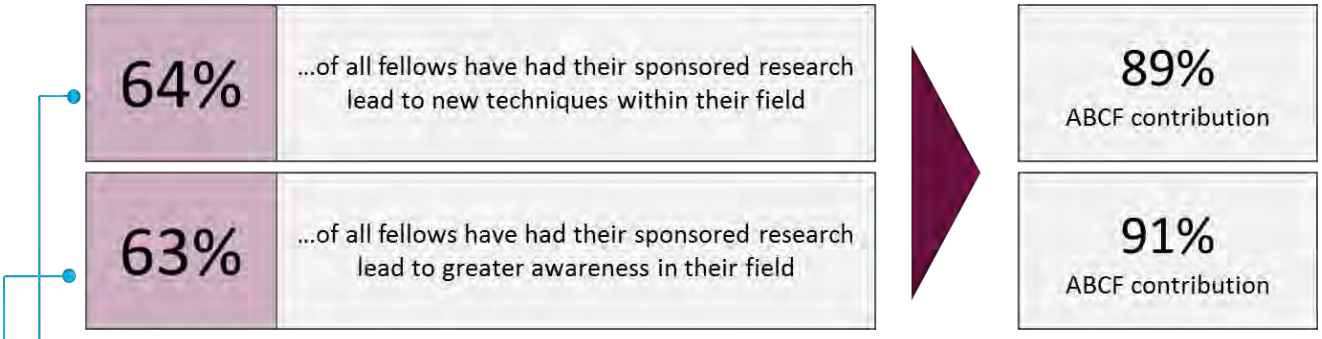
Figure 37: Impact pathway and the BecA-ILRI Hub's role



"Upstream" impact of capacity building activities

Current fellows and alumni have indicated that their ABCF research led to new techniques within their field (c.64%) and greater awareness of their field of research (c.63%). For the advanced AR4D of ABCF fellows this impact is most often derived from the recognition and influence described in Section 5.3 and through peer reviewed publications, being cited in other works, and speaking at conferences of which 20%, 20%, and 27% have been accomplished respectively.

Figure 38: Impact of ABCF fellows' research within their field of research



" [Through my ABCF-sponsored research] I identified useful diagnostic markers for Malignant Catarrhal Fever (MCF), a devastating cattle viral disease. Currently, [I am] furthering the research to develop a simple, rapid pensive test for early detection and control of the infection in cattle." – ABCF Alumni

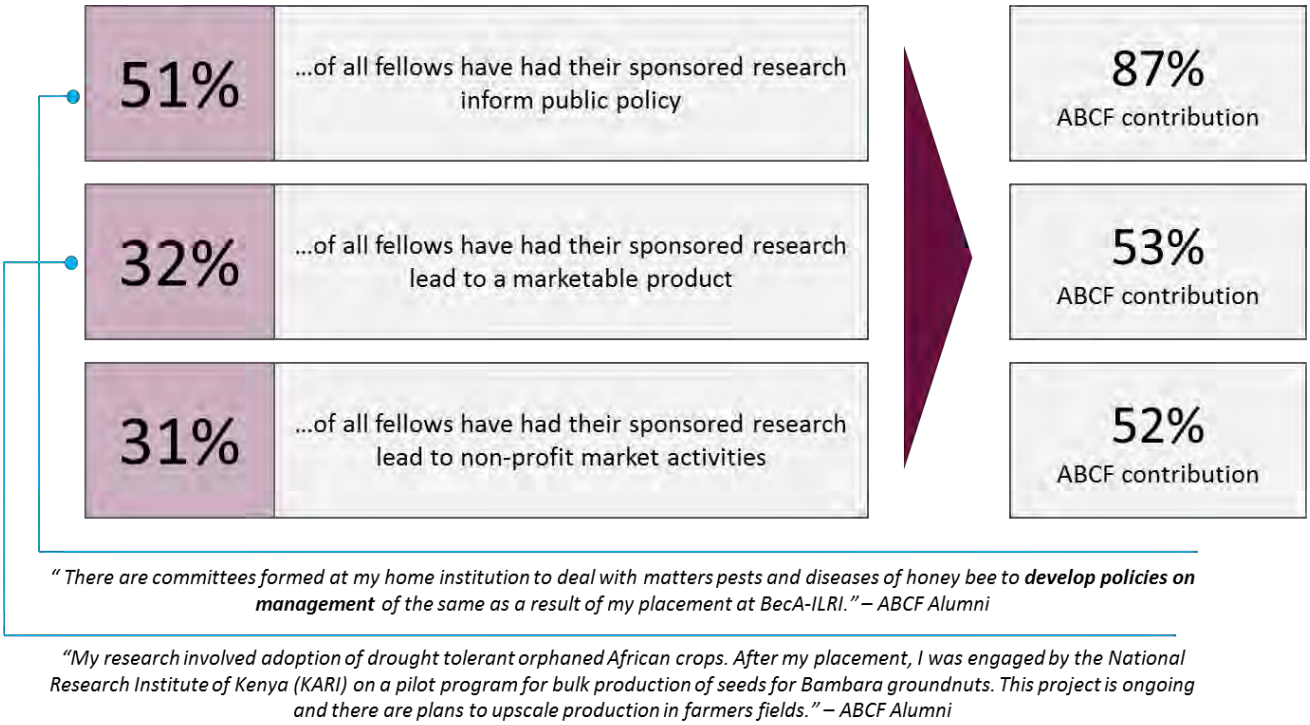
" The execution of my research project on Common bean genetic diversity and population structure in Ethiopia is currently used as an important source document for the National Bean Genetic Resource Conservation/Research." – ABCF Alumni

After the fellowship most visiting scientists either go on to continue their research at their home institution with new funding or partnerships (57%) or go back to the BecA-ILRI Hub as repeat fellows. When back at their home institution the knowledge they gained at the BecA-ILRI Hub results in training workshops being held (29%) and improvements to the curriculum (47%). In addition, 52% of alumni stated that they have contributed to more researchers applying to the ABCF from their home institute. Given that only half of surveyed alumni stated they were driving at least one of these benefits within their home institution, this is an area that would warrant greater investigation and engagement from the BecA-ILRI Hub. Overall the knowledge transfer of ABCF fellows within their home institutions is an important indicator of success for the ABCF program.

"Downstream" impact of capacity building activities

Of the alumni surveyed 81% stated that they continued to further pursue and develop their ABCF funded research post fellowship. While it is challenging to attribute the ABCF program to specific downstream impacts on African farmers, 52% of alumni respondents stated that their research has gone on to be replicated by other scientists, and roughly one third of respondents surveyed stated that their research has resulted in a tangible policy, product, or activity for beneficiary communities.

Figure 39: Impact of ABCF fellows' research on broader AR4D landscape



An example of the ABCF's contribution to furthering alumni bioscience research is in the case of developing a vaccine for livestock East Coast Fever in Sudan by providing the necessary short-term diagnostic facilities and long term mentoring and peer networks for what is now being nationally deployed. The connection between ABCF funded researchers and the impact on end beneficiaries is an important area for further investigation and tracking through KPI's and monitoring and evaluation processes.

In interviews, all fellows were asked to visualise their impact pathways and then describe the theory of change, the potential lives affected, key actors, and challenges faced with implementation. While all fellows were able to detail the above points the ability to explore different possible NARS avenues and actual ownership of the implementation process varied. Most referred to government bodies and parastatal NARS as their primary dissemination partners while a relatively small minority mentioned interacting with private actors such as NGOs, private breeders, community associations, etc. However, in speaking with the BecA-ILRI Hub staff and management they have mentioned the almost immediate effects of the M&E Scientist in getting current fellows to think about these pathways and possibilities. Furthermore, the new application process includes a stronger emphasis on applicants to outline the impact pathway of their project.

These important insights on the direct impacts and enabling effects of the BecA-ILRI Hub and the ABCF program are further supported by case studies of two fellows (Dr. Alexander Bombom and Dr. Diaeldin Salih Hassan) and a home institution (Gulu University, Northern Uganda). Please see Appendix A for these case studies.

Summary of impact evaluation of the ABCF on capacity building in the region

Key Strengths

- **Strong delivery on building capacity of individual researchers.** More than 90% of all fellows indicated they either improved on existing skills or gained new skills during their time at the BecA-ILRI Hub. Similarly c. 90% also asserted the ABCF had a positive impact on their soft skills such confidence/empowerment, people management, and project management
- **Significant contribution in creating networks and opportunities for influence.** Roughly 50% of fellows have learnt about new educational and job opportunities, imperative to further their careers. Additionally, more than 75% of respondents indicated that they have gained recognition with key influencers such as parent institutions, private and government sectors, and donors.
- **Support in securing financial benefits.** Across all stakeholders surveyed (current fellows, alumni, and home institutions), the ABCF has played a significant role in enabling c. 80% of respondents to secure at least one financial benefit (e.g., funds, grants, scholarships and awards)
- **Strong engagement at the beginning of the impact pathway to promote research.** 64% of fellows indicated their research led to invention of new techniques used in the field. 63% said their engagement with ABCF resulted in greater awareness of their field of research, with c. 27% being invited to speak at conferences and a further 20% being cited in other works and peer reviewed publications

Development Needs

- **Limited engagement with fellows on project implementation.** Although the BecA-ILRI Hub has been a strong performer in building hard and soft skills of researchers, they have had limited impact on training fellows on project planning and implementation. For example, 45% of fellows did not identify and discuss strategies to mitigate external risk factors that might affect their projects; additionally, c. 60% of them not completing major project milestones in the allocated time
- **Limited access to specific financial benefits.** Although c. 80% of individuals stated they had receive at least one research related financial benefit, across each benefit, there is very low penetration i.e., less than 40% of all fellows have been able to access a specific benefit (e.g., 13% of current fellows and 21% of alumni have received grants). Similarly only c. 40% of home institutions have been able to secure funding and/or grants despite their engagement with the BecA-ILRI Hub.
- **Targeted engagement with home institutions in building institutional capacity.** Only c. 50% of all home institutions surveyed have engaged with the BecA-ILRI Hub on its capacity building activities beyond fellowships (e.g., scientific research writing and lab management). Similarly, roughly half of fellow alumni surveyed stated a direct contribution they have made to the capacity building of their home institutions (e.g., through holding training workshops and improving curriculum at the institutions). This warrants further investigation.

Summary of impact evaluation of the ABCF on capacity building in the region
• **Lack of engagement at the end of the impact pathway.** There is an opportunity for the ABCF to add value to fellows' engagements in driving application of their research in the field. This could primarily be done through creating valuable networks with key influencers such as funders, private and government sectors, and policy makers.

6. Recommendations

The strong performance and impacts of the ABCF on African AR4D have been outlined in this report as well as areas for improvement and development. Based on our evaluation and the engagements with a broad range of ABCF stakeholders we have outlined a series of recommendations below structured into three categories:

A. Recommendations that can be executed in the short-term with low-medium effort requirements.
B. Recommendations that have a medium term time horizon for execution and require further exploration.
C. Broader longer-term strategic questions for consideration.

A. Short term/immediate action items

Development of an M&E framework **that identifies, creates, and monitors KPI targets across financial, operational, and capacity building activities.** This is essential to being able to identify and track areas of strength and development, as well as the impact the BecA-ILRI Hub is driving through its capacity building activities. This includes building on the established Key Success Criteria in the areas of efficiency, relevancy, and quality measures. This can help clarify on-going, real time, issues such as whether current fellows are accessing all services available (i.e. our survey shows only 63% use administrative staff). In addition to planned exit surveys, a follow-up survey of key stakeholders can inform an understanding of the ABCF program's performance, positive effects, and areas for improvement.

Systematize a management and information system **for stakeholder contacts and tracking of capacity building activities underway.** This would centralise information on the history and status of outreach and capacity building activities with stakeholders as well as ensure completeness and consistency of individual and institutional contact information. Such knowledge and referencing allows for more effective and efficient outreach, as well as transparency on what activities and engagements are underway across stakeholders.

Reduce amount of time senior researchers **are spending on administrative duties (25% or more of their time)** by reallocating these activities to core operational staff or culling where feasible. Examples cited by interviewees were the time spent by senior researchers on non-content related application processing, and activities related to the on boarding of fellows. Reducing the administrative responsibilities of senior researchers would allow more of their time to be allocated to training, mentorship and progressing their research.

Increase systematic mentoring and peer networking activities. The importance of role modelling and mentorship is key in the day-to-day work of visiting researchers but these relationships – as well as peer connections – are not formally reinforced outside of weekly progress report meetings. Peer and mentoring activities could include an integrated buddy system, team building exercises, salons, and volunteering.

***Include training on project management (planning and implementation) in* the ABCF induction and workshop syllabi** given 45% of fellows did not identify and discuss strategies to mitigate external risk factors that might affect their projects, resulting in 47% of respondents not completing major project milestones in the allocated time. Another important area for additional training is on writing of funding proposals, which was highlighted by stakeholders as an area for development. The BecA-ILRI Hub management has also recognized this is an area of development and are currently integrating proposal writing into the ABCF curriculum.

Explore whether the BecA-ILRI Hub is achieving the right mix and balance of support to less-resourced versus strong NARS in the region. Our data on this was inconclusive given that 80% of surveyed respondents were from strong NARS. Our hypothesis is that the BecA-ILRI Hub currently provides disproportionate support to strong vs. less-resourced NARS, in part because the strong NARS are better positioned to proactively engage and target the BecA-ILRI Hub for support. However, in order to maximise its impact to institutional capacity building in the region, it is important that the BecA-ILRI Hub has a clear strategy on which types of institutions it believes it can best drive value through, and that includes the consideration on the existing institutional strength of the NARS. Currently, the BecA-ILRI Hub is addressing this issue through collaborations with ASARECA to drive engagement of less resourced NARS and AWARD to drive enrolment of women scientists.

B. Areas for further exploration

Prioritize opportunities to engage and leverage ABCF beneficiary networks to drive greater engagement with the BecA-ILRI Hub across the region. Currently, the BecA-ILRI Hub under-communicates with beneficiaries after their ABCF fellowship/workshop. There are ways to continue engagement with fellows and workshop participants, upon returning to their home institutions, and maximize the progress they can make in their home institution environments. Instituting post-workshop/fellowship engagement could help enable individuals to better tackle some of the key constraints they come up against in their home institutions (for example, the challenge of insufficient available mentorship and appropriate lab facilities).

Use more strategic communications to increase and amplify awareness raising of the BecA-ILRI Hub and its impact, beyond the existing newsletter and ad hoc communication activities. This could include systematizing communications in areas such as the profiling and awareness of advocacy developments, research successes and opportunities, and career and professional development opportunities (including funding opportunities).

Identify how to increase the number and reach of fellowships and home institution capacity building activities. Critically this includes a plan for scaling up the number of fellowships it offers per year as the improvement most cited by stakeholders when asked how the ABCF could seek to maximise its impact on capacity building in the region. In terms of the institutional capacity building activities it is important to explore ways to increase the absolute number and mix (less-resourced vs. strong) of NARS supported by the BecA-ILRI Hub, both in terms of fellowships and broader advisory services (technical assistance, collaborative funding, etc.) There is clear demand for these additional services from existing home institutions with which the BecA-ILRI Hub has a relationship, as well as potential unmet demand from home institutions currently not supported by the BecA-ILRI Hub. Two key areas highlighted by home institution respondents for additional Hub support were in connecting to key donors/funders, advice on funding proposals, and consultative input on lab management and design.

Seek to increase the operational sustainability of the BecA-ILRI Hub through successor planning for the BecA-ILRI Hub Director and Capacity Building & Training Director, as two critical dependencies on the successful management and operation of the BecA-ILRI Hub and ABCF. In addition, we recommend reviewing the value proposition for Hub staff scientists and researchers to increase retention over the long term (given the trade-offs between progressing their research career and carrying out their ABCF mentoring/management responsibilities). Lastly it will be valuable to review the sufficiency of Hub staff resources in the context of the targeted growth outlined in the Business Plan.

Seek to increase the financial sustainability of the BecA-ILRI Hub through increasing the volume and mix of donors that provide Core Hub and ABCF program funding. This should seek to include African based donors, such as AGRA, as well as international foundations and donors such as DFID, and Rockefeller. It would also be valuable to explore funding opportunities and partnerships with private sector companies. Additional focus will also be required to increase the number of externally funded researchers through (i) increased engagement with NARS on building these costs into their programmatic and research proposals, and (ii) increased engagement with the BecA-ILRI Hub's alumni and workshop participant networks to increase the conversion of returning researchers on a fee-paying basis. Lastly it would be valuable to explore opportunities to secure external funding for fellows that wish to commercialise their research (e.g. through the ABCF).

Explore opportunities to increase downstream impact by incorporating impact pathway thinking and skill set development as part of the fellowship curriculum. In addition, the BecA-ILRI Hub could explore the opportunity to connect alumni and researcher networks to potential funders and private sector partners to increase opportunities for continued research post fellowship and conversion to downstream benefits. Building stronger and more collaberative relationships with the private sector represents a multifacited opportunity to increase funding, expose fellows to new evironments via research attachments (secondments) and untimately increase the commericalization/adoption/delivery of the science fellows work on to farmers. Examples of potential private sector partners are companies such as Beyer Corp Science, food and feed companies such as General Mills and Purina, and animal science companies such as Genus Plc.

C. Longer term strategic considerations

Optimizing the BecA-ILRI Hub's positioning within the broader CGIAR landscape. The ABCF program is a part of the BecA-ILRI Hub, a unique partnership in a complex consultative group (CG) structure. Under the recent reforms, money now goes to CRPs who then "buy" equipment from CGs. This means BecA must navigate this scheme to identify and pay for facilities, 15% overhead, and other essentials, which ABCF researchers utilize. Furthermore, stakeholders and partners have cited ILRI bureaucracy inhibiting the drive and charisma of BecA management in launching programs and exercises. Given possible confusion in procedures and understanding each other's roles, consistent engagement with ILRI is required. It would be valuable for the BecA-ILRI Hub to explore how it can optimise its positioning within the broader CGIAR landscape and ILRI governance system.

Balancing strategic trade-offs and maximizing impact on biosciences capacity building in Africa. The key strategic question facing the BecA-ILRI Hub and ABCF at this point in its evolution is how to grow and orient its activities and resources to maximize its impact on biosciences capacity building and research in the region. Whilst the areas outlined below are not binary choices, there are tensions and trade-offs that exist within them and will need to be successfully balanced and addressed by the BecA-ILRI Hub going forwards:

Quality vs. Scale: Maintaining the high quality of its core competencies (world class bioscience facilities, training and research), while also expanding its reach to more individuals and institutions in the region. It will be important to achieve both of these; however, there is a risk that quality will be sacrificed if growth is not achieved in a sustainable way through sufficient funding and resources.

Individual vs. institutional capacity building activities: Whilst the mission of the BecA-ILRI Hub and ABCF is to offer both, currently the fellowships receive greater mindshare of the BecA-ILRI Hub's time and resources than broader NARS capacity services such as lab design and management, funding proposals and advocacy. The latter has the potential to be highly impactful within the region, and warrants additional focus.

Increased engagement in Central and East Africa vs. expansion into West Africa: The ABCF's activities are geographically concentrated in East Africa, with significant demand remaining from individuals and institutions across the Central and East Africa region. At the same time, there is strong interest for expansion into West Africa given the lack of available biosciences capabilities and potential for impact. Regional expansion into West Africa is an exciting opportunity but the strategy and approach for doing so would need to be carefully balanced with the continued needs within the Central and East Africa region.

Upstream vs. downstream capacity building activities: Maintaining its focus as a center of excellence for high end biosciences research which enables downstream impact through skill set development and capacity building vs. looking at opportunities to directly engage further down the impact pathway. This presents an interesting question as to where the BecA-ILRI Hub is best positioned to add value. Whilst it is important to consider downstream opportunities, its core competencies and opportunity for impact currently remain as a key *enabler* of downstream impact through its upstream activities and services.

Strategic positioning of the BecA-ILRI Hub in the agriculture and food security landscape: Clearly, the BecA-ILRI Hub has contributed significantly to the professionalization of AR4D in its African sub-regions of focus. Individuals and institutions have been strengthened and the bar for scientific excellence across the continent is being raised. Looking ahead, the BecA-ILRI Hub should consider a number of important trends and their implications sustained operations and impact.

Specifically, as the broader CG system contemplates its role in 'delivery' (that is taking the outputs of science to the farmer), the BecA-ILRI Hub must articulate its ability to increase impact at the later stages of its impact pathway. As Africa wrestles to balance the opportunity of increased productivity with the reality of excessive post-harvest loss, the BecA-ILRI Hub has a role to play in championing appropriate and affordable technologies that address these challenges. The increased interest of private sector companies in the emerging African agriculture positions the BecA-ILRI Hub well to maximize its potential through public private partnerships, especially those that increase the BecA-ILRI Hub's exposure to vertically integrated solution development, extending its influence from the lab to the farm.

These are, in short, exciting times for the BecA-ILRI Hub, as it becomes increasing relevant in cross-sector collaboration, regional integration and the international frontiers of AR4D.

Strong formal partnerships based on shared understanding and objectives, clear value-addition, synergies.

Appendix

Appendix A: Case studies (x3)

Alexander Bombom, PhD — ABCF Fellowship Alumnus (2012)

Background

Dr. Alexander Bombom is Lead Project Scientist for the Sorghum-Maize Hybrid project at the BecA-IRI Hub. The project evolved following a successful cross generated by Dr. Bombom in 2009 involving maize and sorghum. Bombom is a graduate of Makerere University, Kampala, Uganda. He holds a Master of Science in Crop Science with a major in plant breeding and genetics and a PhD in Plant Breeding, Genetics and Biotechnology. He is currently completing a post-doctorate program at the BecA-ILRI Hub.

Research context

Application of the maize-sorghum hybrid technology will contribute to increased genetic diversity in maize and sorghum and is a vital tool in ensuring a food secure and nutritionally sufficient Africa. Maize and sorghum are the most produced crops on the continent and are important staple foods in sub-Saharan Africa.[24] Africa accounts for 6.5% of global production yet it consumes 30% of annual harvest.[25] Similarly, worldwide sorghum production is 60 million tons of which Africa produces 30%.[26] In light of the recent climate changes, Africa's future climate is likely to be more drought-or more flood-prone which poses a threat to food security in the continent[27]. In fact, Africa's food availability and food security is tied with staple cereals like sorghum and millet which are better adapted to drought and water logging. However, these crops still need improvement in nutritional quality, environmental tolerance, and overall yield. Dr. Bombom's maize-sorghum hybrid technology aims to address this unmet need through the creation of new breeds to help producers increase quality, yield, and resistance to abiotic stresses.

Value from the ABCF Fellowship

Dr. Bombom came to the BecA-ILRI Hub with an idea which now shows remarkable potential not only as a result of having access to research facilities through the ABCF, but also due to the moral support of the BecA-ILRI Hub's staff. Before the ABCF fellowship, the maize-sorghum research question was as a side project given no credence from university professors or several colleagues. After all, this hybrid cross has been unsuccessfully attempted for over 40 years by researchers around the globe. After meeting the BecA-ILRI Hub staff at a scientific research paper writing training workshop, Dr. Bombom successfully used the ABCF fellowship to conduct the molecular characterization of his first maize-sorghum hybrid line. In the laboratory, Dr. Bombom applied the molecular technologies, workshop trainings, and mentoring from the BecA-ILRI Hub staff to further his work. By leveraging the scientific research paper writing training he was able to finish his PhD dissertation, publish three manuscripts, and successfully write a proposal to the Bill and Melinda Gates Foundation to fund his two-year post-doctorate fellowship at the BecA-ILRI Hub.

[24] Unknown. "Sorghum in Africa." Accessed on 3.3.2014. http://biosorghum.org/importance_sorhum_africa.php
[25] Unknown. "Maize." Accessed on 3.3.2014. http://www.iita.org/maize or FAO
[26] Taylor, JRN. "Importance of Sorghum in Africa." Access on 3.3.2014. http://www.afripro.org.uk/papers/Paper01Taylor.pdf
[27] Unknown. "Sorghum in Africa." Accessed on 3.3.2014. http://biosorghum.org/sorghum_challenge.php

Areas of opportunity

Dr. Bombom, like many ABCF alumni, continues to look for opportunities to grow professionally and have an impact. Through the BecA-ILRI Hub networks he is now part of a growing community of practice in the areas of crop-science and advanced genomics that stretches from East Africa to the United States of America and Israel. To maximize impact, his research is not only focused on replication but also on expanding the hybrid breeding lines to include other crops and regions. Additionally, he is keen on engaging with local NARS (via extension officers) in order to facilitate a participatory approach with smallholder farmers to disseminate the hybrid lines.

Diaeldin Ahmed Salih Hassan, PhD — ABCF Fellowship Alumnus (2011 and 2012)

Background

Dr. Diaeldin Ahmed Salih Hassan is currently Associate Professor at the Veterinary Research Institute (VRI) in Khartoum, Sudan. He specializes in livestock and tick-borne diseases with a focus on tropical theileriosis (TT) and East Coast Fever (ECF). Having first worked on this disease and vector since 1998, and during his PhD studies Dr. Hassan is now able to see the innovation and adoption of his research in Sudan as well as the rest of sub-Saharan Africa.

Research context

ECF is one of the most devastating livestock diseases in eastern, central, and southern Africa accounting for the annual death of 1.1 million cattle and $168 million in economic loses.[28] The scale of the problem is enormous with over 30 million and 8 million cattle at risk in Sudan and South Sudan, respectively. The disease is 100% lethal if left untreated and existing remedies have revolved around post-symptomatic chemotherapy or pesticides that target the transmitting parasite, *Theileria parva (T. parva)*. Given concerns over parasite chemical-resistance and spill over effects to humans the demand for a mass produced, strain-specific vaccine is quite high.

Value from the ABCF Fellowship

Dr Hassan was introduced to the BecA-ILRI Hub in 2011 through his collaboration on ECF research with the BecA-ILRI Hub scientist Dr. Richard Bishop. The ABCF Fellowship was particularly instrumental in allowing Dr. Hassan to further his research by providing the necessary funding and facilities. The objective of his ABCF-sponsored project was to determine the genotyping *T. parva* in South Sudan and compare this to the existing vaccine strain. Like many senior scientists with an established research agenda, he used the ABCF Fellowship to complete a specific concept note. Dr. Hassan found the weekly project reports that are expected of each ABCF fellow helpful in measuring progress, brainstorming, and building up communication abilities. During the ABCF, with the help of Dr. Bishop and the BecA-ILRI Hub leadership, he contributed to the drafting of a successful research proposal to a German partner to continue and expand the scope of the project to other disease lines.

[28] A.W. Mukhebi and B.D. Perry. "Economic Implications of ECF in eastern, central, and southern Africa." <http://www.fao.org/wairdocs/ilri/x5485e/x5485e0h.htm>

Through the ABCF, Dr. Hassan is now part of a community of practice focused on ECF. The *Theileria parva Group* of 50 researchers from around the globe actually consists of 6 other the BecA-ILRI Hub scientists who worked together via the ABCF fellowship. These researchers (from Sudan, South Sudan, Tanzania, Kenya, and Uganda) exchanged materials and knowledge while at BecA and are now working on a pan-East Africa project to control the spread of ECF.

Areas of opportunity

Although an extraordinary success story, Dr. Hassan also exemplifies some of the additional challenges that face senior scientists who often have numerous professional engagements. In addition to working on two peer-reviewed manuscripts with the BecA-ILRI Hub, he is also focused on applying his research in the field, as well as his teaching duties. Following the successful national deployment of a Sudanese TT vaccine in 2012, Dr. Hassan is now focused on promoting its expansion into North Africa with the help of several institutions, including but not limited to: VRI, FAO, IFS, IAEA and African Union. Meanwhile, through his teaching responsibilities, he is able to transfer the protocols and techniques he has learned at the BecA-ILRI Hub to approximately 10-15 postgraduates (4 PhDs) and 30 undergraduates yearly. He believes that the ABCF Fellowship provides one of the best means for young researches to gain the latest skill sets but also to experience how others work and perceive increasingly global bioscience issues.

Gulu University, Northern Uganda

Gulu University ("Gulu") is a public university in Northern Uganda, established in October 2002. Although it is a small institution with only 4,177 students admitted from the 2011/2012 academic year, Gulu is ranked second to Makerere University and 49th on the African continent in peer-reviewed publications. Gulu's vision is to be the leading academic institution in Northern Uganda in the promotion of rural transformation and industrialization for purposes of ensuring sustainable development. the BecA-ILRI Hub has been actively engaged with Gulu to develop its biosciences platform specifically the Molecular Biology and Genetics program which currently has 12 scientists: 3 professors, 3 PhD candidates, and 6 MSc students.

Institutional constraints

The legacy of the 21-year Northern Ugandan civil war, which ended in 2008, continues to impede the building of agriculture research and development capacity at Gulu University. Inherent in the conflict was the destruction and neglect of general infrastructure that are the basic requirements of operating a sustainable biosciences centre. These requirements include reliable electricity to operate equipment and secure roads to facilitate procurement of research materials and reagents. Additionally, the relocation of skilled individuals and stagnation of the education system have contributed to the shortage of educators and researchers. Gulu's value proposition is therefore not only in building biosciences capacity through furthering higher education, but also in ensuring application of learning towards catalysing rural transformation in a post-conflict region.

Gulu's challenges are indicative of challenges that other NARS institutions face i.e., lack of proper infrastructure and skilled personnel to drive biosciences research and application. The main challenges in developing biosciences capacity at Gulu have been: (1) Lack of proper laboratory hardware and software,

including delays in procurement and limited supplier networks, (2) Inability to attract and retain senior researchers and professors, partly due to underdeveloped infrastructure, and (3) Limited number of highly skilled scientists e.g., a lack of writing skills amongst current researchers exacerbates researchers' inaccessibility to an already limited pool of funding, as well as resulting in a limited ability to convert available data into publishable manuscripts.

Nature of the BecA-ILRI Hub relationship

Since 2009, Gulu has leveraged the BecA-ILRI Hub as a partner for growth to capitalize on government and private investments. The Gulu-BecA partnership began through a joint proposal to the Government of Uganda for a $784,000 grant to establish a biosciences centre. To date, the BecA-ILRI Hub has partnered with Gulu in a number of other capacity building activities outside of the ABCF Fellowship and annual the BecA-ILRI Hub workshops. These include, but are not limited to, hosting special trainings on lab management, providing special experts for technical assistance, and help in procuring $400,000 of equipment donations from the Seeding Labs Inc., in the US. These examples illustrate the important role the BecA-ILRI Hub has played in providing valuable networks and building both institutional and individual researchers' capabilities that have been imperative for Gulu's growth.

Areas of opportunity

Gulu University has identified two key areas for the BecA-ILRI Hub to assist in furthering build biosciences capacity at the institution. Firstly, in order to promote local research activities, it will be imperative to consider lowering bench fees for potential paying researchers who need access to the BecA-ILRI Hub. Secondly, there is a need to mentor younger inexperienced scientists and female scientists who will be instrumental in addressing issues of food insecurity in the continent and in the region.

Appendix B: Stakeholders engaged in evaluation

A description of all stakeholders engaged in this evaluation

Stakeholder type	The BecA-ILRI Hub target audience	Evaluation definition
ABCF fellows	• Crop and livestock scientists • MSc/PhD qualifications • Africans nationals • *Optional*: Recruited and co-sponsored by AWARD or ASARECA	**Current fellows:** *Conducting research at the BecA-ILRI Hub campus as of January, 2014.*
		Alumni fellows: *Conducting research at the BecA-ILRI Hub campus from 2010-2013.*
ABCF workshop participant	• Crop and livestock scientists - MSc/PhD qualifications - Africans nationals • Funders • Policy makers • Donors	*Attended any one of the four annual skills trainings held annually and/or the Agriculture Research Connections workshops from 2010-2013*
Externally funded researchers	• Crop and livestock scientists • MSc/PhD qualifications • Africans nationals	*Funded **by outside sponsor** and on the campus at any point from **2010 to the present.***
Home institutions	• NARS institutions - University departments - Research institutes - Government ministries - Multilateral organizations - NGOs - Private labs, breeders, etc.	• *Provide the full-time staffing backing to researchers and workshop participants.* • *Direct beneficiaries of the BecA-ILRI Hub collaborative funding, networking, and capacity building activities.*
Staff	• Crop and livestock scientists - Senior scientists - Junior scientists (i.e. post-docs) - Research assistants - Technicians	**Research staff:** *Primary professional duties are to conduct research as well as mentor and/or assist visiting scientists with planning and procurement.*
	• Management, administrative, or communications experience • Commitment to Africa and AR4D	**Non-research staff:** *Primary professional duties are the administrative and/or program management capacities of the BecA-ILRI Hub.*
Donors	• Multilateral aid organizations • Bilateral aid organizations • International research institutions • Foundations • AR4D research funding organizations (i.e. AWARD)	*Give subsidized or grant funds to further the BecA-ILRI Hub capacity building activities, including the ABCF fellowship and workshops.*

A list of all stakeholders interviewed

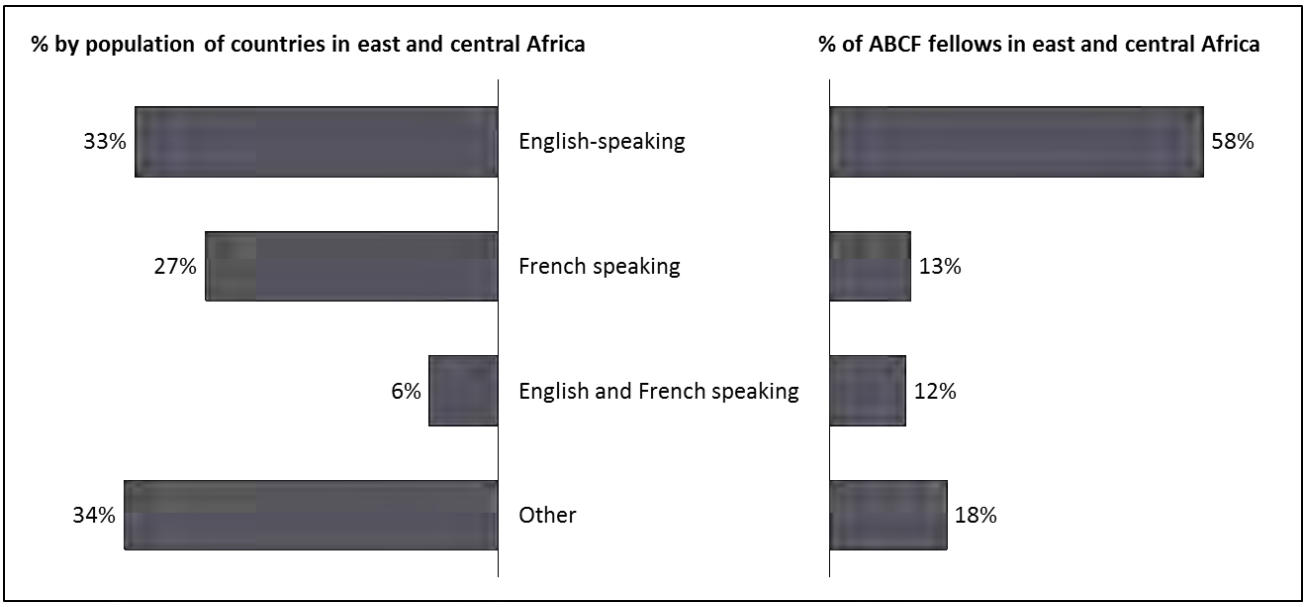
Stakeholder group	Interviewees
ABCF current fellows	1. Joshua Amimo 2. Gedeon Nsabiyumva 3. Hilda Bachwenkizi 4. Tesfamichael Abraha 5. Jane Wamaitha
ABCF alumni fellows	1. Christian Keambou 2. Felix Meutchieye 3. Alexander Bombom 4. Joan Modupe Babajide 5. Rasha Ali 6. Diaeldin Salih Hassan 7. Issac Macharia 8. Charles Masembe
Home institutions	1. Gulu University 2. Kenya Tea Research Foundation 3. University of Queensland 4. Burundi Agriculture Research Institute (ISABU)
Staff – non research	1. Appolinaire Djikeng 2. Rob Skilton 3. Valerian Aloo
Staff – research	1. Moses Njahira 2. Roger Pelle 3. Francesca Stomeo 4. Martina Kyalo 5. Solomon Maina
Donors and co-funders	1. CSIRO (x2) 2. BMGF 3. UNESCO 4. Syngenta Foundation

Appendix C: Supporting data for evaluation

Geographical reach of the ABCF to east and central Africa

Approximately 58% of fellows and workshop participants of east and central African origin come from English-speaking countries, and 13% from French-speaking countries although English-speaking countries make up 33% of east and central Africa's population and French-speaking countries make up 27%

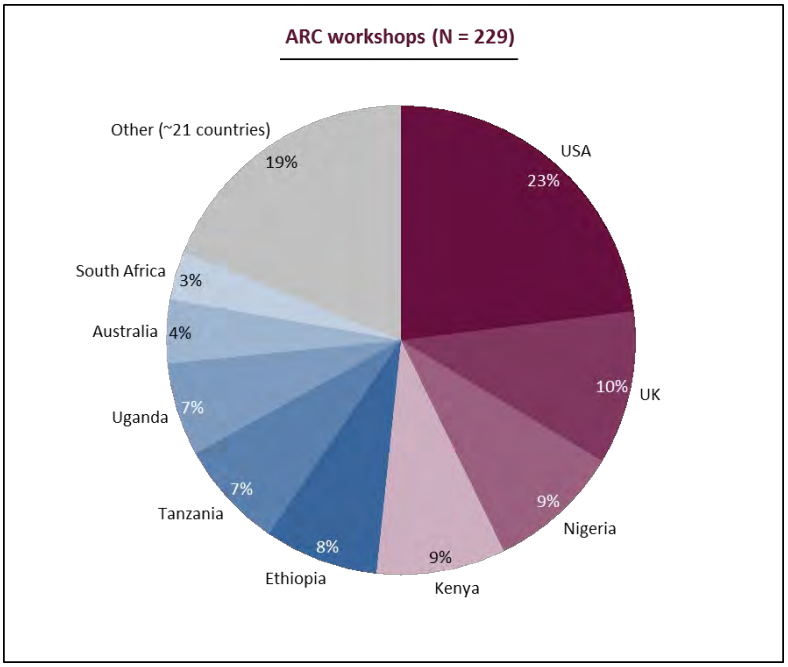
Figure 40: Reach of the ABCF program by national/official language



Reach of ARC Workshops

Amongst African institutes, majority of ARC participants came from Uganda, Kenya, Tanzania, Ethiopia, and Nigeria, which is a similar breakdown as the ABCF fellowships and annual workshops (with the exception of Nigeria).

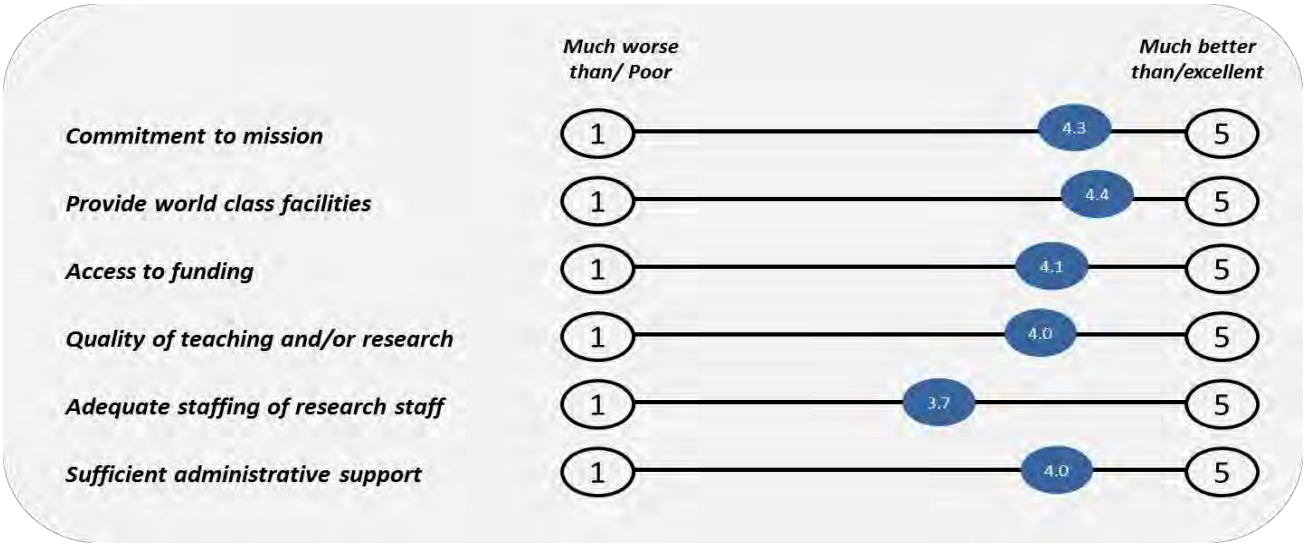
Figure 41: Reach of ARC workshops



Performance of the ABCF relative to other AR4D programs in the region

When compared to other AR4D programs in the region across the metrics shown below, ABCF was rated "much better" than these institutions by over 90% of stakeholders (i.e., an average of 4.2 on a scale of 1-5).

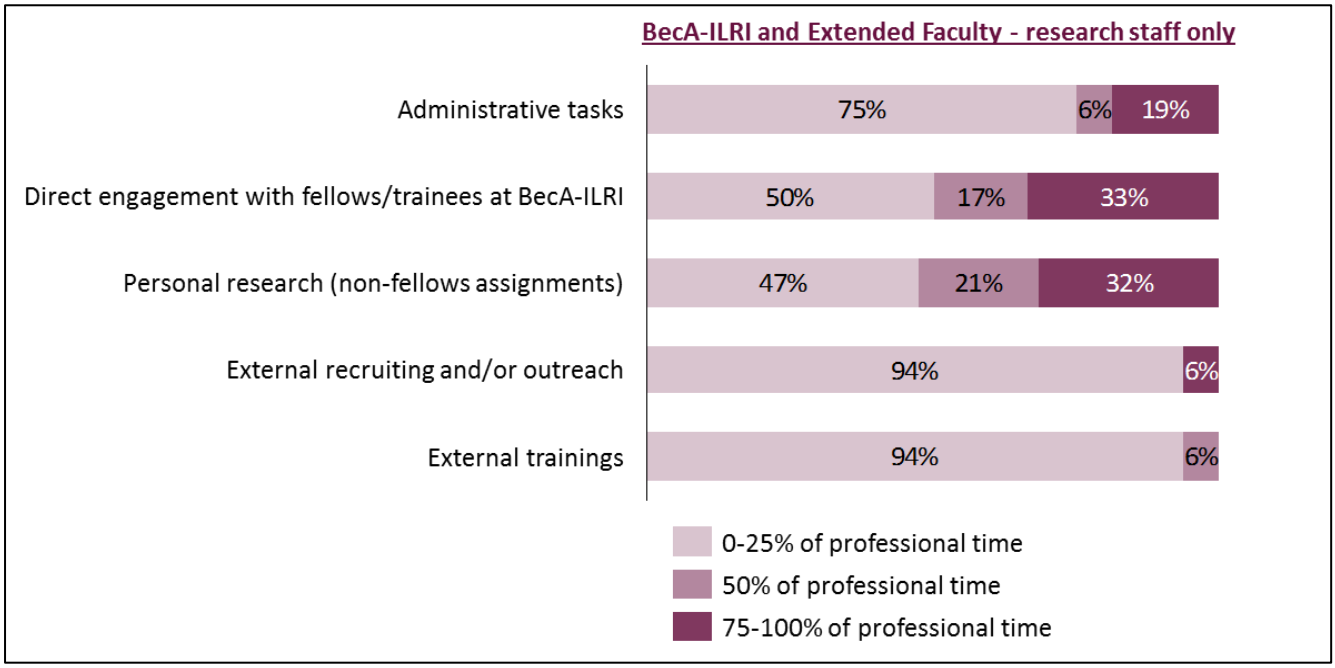
Figure 42: ABCF performance relative to other AR4D programs



The BecA-ILRI Hub time allocation for research staff (i.e., research assistants and lab technicians)

Research staff indicate spending a significant amount of time on administrative tasks; 25% of respondents spend more than 50% of their professional time on administrative tasks.

Figure 43: Time allocation for the BecA-ILRI Hub and extended faculty (research staff only)



Key performance metrics provided by the BecA-ILRI Hub

A. <u>ABCF critical 10 success factors:</u>

1. Vibrant Planning, Monitoring & Evaluation and Quality Control System
2. Strong formal partnerships based on shared understanding and objectives, clear value-addition, synergies
3. An effective well-targeted Communication Strategy
4. Responsiveness and relevance to ECA NARS capacity building and research priorities
5. High quality fellows – high performing within the NARS and beyond
6. High quality and relevant research outputs for improving agriculture in Africa
7. Visible success stories
8. Effective and efficient management team and structure at the BecA-ILRI Hub
9. An effective resource mobilization strategy
10. A critical mass of highly motivated research scientists and supervisors at the BecA-Hub

B. <u>Tools currently in place:</u>

1. ABFC fellows' progress seminar monitoring and quality assurance template
2. Database of publications from ABCF fellows research
3. Training workshop evaluation tool
4. Training workshop reports template (recently introduced)
5. Training workshop concept note template (recently introduced)
6. Training workshop planning template (recently introduced)
7. Template for institutions to recommend successful ABCF fellowship applicants / nomination letter that directly identifies the capacity gap areas ABCF is addressing (recently introduced)

8. ABFC Fellowship online application system (recently introduced)
9. ABCF Fellowship online review system (recently introduced)
10. Form for ABCF Fellows to evaluate BecA

C. Key expected outcomes and key performance indicators

Key outcomes	Performance Indicators
• More highly skilled and knowledgeable research scientists able to conduct high quality research (can specify some key areas) • More bio-scientists able to network and partner around specific research areas • Improved quality of biosciences research in ECA NARS • ABFC becomes the BecA-ILRI Hub's leading flagship programme	• Number of manuscripts highly ranked by BecA internal review process • Number of collaborative concept notes prepared and submitted for internal review under the various projects • Number of fellows able to use the project innovations/products and/or skills (highlight some key areas)
• Increasing number of applicants seeking placement at the BecA-ILRI Hub • Expanded scope of biosciences research themes / topics handled at the BecA-ILRI Hub • Increase in the diversity of topics of biosciences research conducted by ABCF fellows • Improved quality of research conducted by BecA Faculty and ABCF fellows • More NARS scientists competent in conducting advanced bioscience R4D	• Number of new advanced bioscience research themes being added to BecA portfolio • Number of manuscripts from BecA scientists highly ranked by BecA internal review and quality assurance mechanism(s) • Number of manuscripts from BecA Fellows highly ranked by BecA internal review and quality assurance mechanism(s) • Number of new collaborative concept notes / proposals developed focussing on new themes • Number of scientist exchange visits between BecA and partners
• More and better skilled African research scientists, researchers and research institution managers • More NARS scientists engaging in competitive resource mobilization • Improved quality of collaborative concepts developed by ABCF fellows • Improved quality of reports and manuscripts submitted by ABCF Fellows • More and better skilled NARS scientists in M&E • More NARS scientists submitting scientific manuscripts to peer reviewed journals for publication • Improved performance rating of ABCF alumni by research institution (employer)	• Number of grant seeking proposals submitted by NARS scientists to CGSs (ABCF Alumni??) • Number of manuscripts from BecA scientists highly ranked by BecA internal review and quality assurance mechanism(s) • Number of innovative collaborative concept notes with strong M&E prepared and submitted for internal review under the various ABCF projects • Number of ABCF alumni researchers promoted on merit
• Improved local capacities of NARS scientists and laboratories in East and Central Africa to conduct and sustain relevant biosciences research addressing food and nutrition security issues	• Number of new research projects in the targeted NARs labs in East and Central Africa focused on improving food and nutritional security in Africa

Appendix D: Review of study design

Key Learnings

Pre-existing data collection/Desktop research

Given the lack of a systemized data collection system, it was difficult to collect the necessary data from a central place and in a standardized format. For example:

- We had some challenges collecting key performance indicators of the ABCF program given these were not documented or easily accessible. However, with the recent implementation of KPI and evaluation tools (see Appendix C) this should be resolved for future exercises. Additionally, it will be important to allocate sufficient time at the beginning of the evaluation process for cleaning and aggregation of data sets
- The demographics data received was not of the highest quality given manual entry of respondents' demographic information. For example:
    - Three respondents from Democratic Republic of Congo would be able to enter their country of origin as "Congo", DRC", or "Democratic Republic of Congo"
    - There were multiple double entries
    - We did not have contact information for all AR4D institutions, consequently, we could only engage a small sample of the Group 1 AR4D institutions (28 out of 74)

  These inconsistencies in the data made it difficult to analyse the data in aggregate. Moving forward, the data collection should be standardized to minimize the back-end calculations and data clean-up e.g., consider using close-ended questions and drop-down menus instead of allowing the respondents to type in responses

Qualitative Research

Qualitative interviews run relatively smoothly and respondents were very willing to engage with us, which can be attributed to the good relationship the BecA-IRI Hub has with its affiliates. Future considerations include the following:

- The evaluators should be cognizant of any ethics requirement prior to the onset of the evaluation exercise to minimize any set backs
- Allocate sufficient time to conduct the interviews and have back-up times and interviewees given the difference in time zones and other scheduling conflicts that might arise

Quantitative Research

We were able to attain a 41% response rate (minimum of 19% from externally funded researchers, maximum of 83% from current ABCF fellows), which higher than the average we have seen in our experience. This high response rate can be attributed to: (1) follow-up from both the BecA-ILRI Hub management and the Dalberg team (2) The reputation and the good relationship the BecA-ILRI Hub has maintained with its affiliates. Considerations for the future include:

- In order to improve response rates earlier check-ins, spaced reminders, and small incentives are options to explore
- It is important to be aware of potential bias that might be introduced if the request for responses is sent by the BecA-ILRI Hub management vs. an independent third party
- The evaluator should clarify terminology with the BecA-ILRI Hub management and hold qualitative interviews with the same prior to creating the surveys in order to capture nuances that will inform the survey design and enable answer the key business questions

Appendix E: Sample research instruments

Questionnaire used for web surveys: ABCF Alumni

Questions
1) *What is your national origin?* *(List, other-please specify)* i. ***How old are you?*** *(List)* ii. ***Are you male or female?*** *(M/F)* iii. ***In what country are you currently based?*** *(List, other-please specify)* iv. ***Highest completed degree of education*** *(List)* v. ***ABCF research area*** *(List, other-please specify)* vi. ***Year at the ABCF fellowship*** *(List)* vii. ***How did you hear about ABCF/The BecA-ILRI Hub?*** *(List, other-please specify)*
2) *Overall, how satisfied were you with your ABCF fellowship?* *(On a scale of 1 = unsatisfied to 5 = highly satisfied)* **3) *Select the top 3 most important benefits you received from the ABCF fellowship?*** *Access to lab materials and facilities (please specify)* *Access to academic materials (i.e. online journals)* *Peer networks* *Mentorship* *Human resource support* *Funding* *Time dedicated for research* *Job opportunities* *Other - please specify* **4) *Have you recommended the ABCF fellowship to your peers?*** *(Select Yes/No)* **5) *Which of the following resources did you access during your ABCF fellowship?*** *Select all that apply* *Laboratory materials* *Funding* *Networking opportunities* *Laboratory facilities (please specify)* *Research staff* *Administrative staff* *Other-please specify* ***5.A How would you rate the quality of the above resources?*** *(On a scale of 1 = low quality to 5 = high quality)* **6) *To what extent does BecA-ILRI achieve the following:*** *Rate on a scale of 1 = not all to 5 = fully achieves from list:* *"BecA-ILRI promotes access to world-class research and training facilities"* *"BecA-ILRI builds capacity of individuals and institutions to harness the latest biosciences technologies to improve Agriculture in Africa"*

"BecA-ILRI promotes the development of cutting edge research into applicable solutions for addressing food security and quality issues in Africa"

"BecA-ILRI creates linkages between individual scientists and between institutions"

7) Which, if any, of the following have you <u>secured</u> post your ABCF fellowship?

<u>Select all that apply from list:</u>

Awards/Scholarships
Patent revenue
Grants
In-kind contributions
Honorariums
Salary/wage
Other-please specify

7.A To what extent do you feel the ABCF fellowship contributed to you securing the funding in each of the above categories?

(On a scale of 1 = no contribution to 5 = strongly contributed)

8) Following ABCF, have you <u>received</u> any of the following?

<u>Select all that apply from list:</u>

Citations/references
Peer-reviewed works
Approved concept notes
Approved funding proposals
Mass media recognition (i.e., radio, television)
Patent approval
Promotion at your home institution
Invitation to present at a conference
Other-please specify

8.A To what extent did ABCF <u>contribute</u> to you getting this recognition?

(On a scale of 1 = no contribution to 5 = strongly contributed)

9) Did you benefit from any of the following <u>networking opportunities</u> through ABCF?

<u>Select all that apply from list:</u>

I have learned about new job opportunities
I have learned about new educational opportunities
training and career development opportunities
I have met new professional colleagues outside ABCF
I have established partnerships/collaborations with new institutions beyond my home institution
Other (please specify)
N/A – none of the above

10) At the onset of your research, were the following elements included in your work plan/project design?

<u>Select all that apply:</u>

Project strategies that are realistic, appropriate and adequate to achieve the results?
Project performance indicators/measurements that are specific, practical, and adequate?
Were external risk factors identified and discussed?

10.A. **Were all major milestones and key deliverables completed within the planned timeframe?** (Y/N)

11) How has your fellowship <u>contributed</u> to your research area?

Select scale 1 = not influential to 5 = highly influential from list:
Informed public policy
Led to a marketable product
Stimulated private or non-profit innovation
Led to new techniques within your field (if so, please describe)
Led to greater awareness of your field (if so, please describe)
Led to replication of your research by other scientists
Other-please specify

12) Which of the following did you gain or improve upon during your time at BecA-ILRI?
Select Gained, Improved, No improvement, N/A from list:
Laboratory etiquette
Specific laboratory techniques (please specify)
New qualitative skill sets (please specify - e.g., presentation skills)
New knowledge about a field of research
New quantitative skill sets (please specify - e.g., data analysis)
Project/implementation management
Certifications
Other-please specify

13) Which of the following have you achieved, related to your ABCF-sponsored research?
Select all that apply from list:
Received funding to continue sponsored research at my home lab
Gone back to BecA-ILRI to continue sponsored research
Formed a partnership to further develop my sponsored research
My sponsored research is being further investigated by a different researcher
My sponsored research findings are being implemented in the field (if so, how and by whom?)

14) Have you pursued any of the following academic paths after your ABCF fellowship?
Select all that apply from list:
Enrolled in a Master's program
Completed my Master's degree
Enrolled in a Ph.D. program
Completed my Ph.D.
Post doctorate program
Other – please specify

15) Which of the following contributions did you make to your home institution post your ABCF fellowship?
Select all that apply from list:
Held training workshops at my lab
Contributed to improvements made to the curriculum at my lab
More researchers from my lab have applied to BecA-ILRI fellowship and/or workshops

14A. If yes to workshops or curriculum, please specify the research area or topic. (Text)

14B. What factors have hindered you from using your skills and knowledge at your home institution? (Text)

16) *To what extent did the ABCF fellowship reinforce the following attitudes and behaviors:*
Select scale 1 = negative, 3 = neutral, 5= positive from list:
Empowerment

Confidence
Risk assessment
Time management
Productivity
Networking skills
People management abilities
Other-please specify

Interview guides used for one-on-one interviews: current fellows

Questions

Participants: At least 5 Fellows have been called for one-on-one discussions in addition to the online survey which was sent out. Interviews are approximately ~45 minutes.
Selection: Done by BecA-ILRI according to the recommended randomized, stratified methodology

Introduction (for facilitator)

- Thank the interviewee for their time and having agreed to meet
- Summarize the goals of the Dalberg engagement and interview goals
    - To discuss ABCF performance as related to the BecA-ILRI Hub's capacity building objectives
    - To understand the impact of the ABCF Fellowship as it pertains to their research and impact back at their home institutions
- Your recommendations will form part of Dalberg's overall findings and recommendations to the BecA-ILRI Hub's leadership team.
- Your responses are kept with strictest **CONFIDENTIALITY AND ANONYMITY**.

Discussion

1. [If unknown] Please introduce yourself including your current research title and your home institution.
2. How did you first hear about the ABCF Fellowship?
3. What were you expectations coming into the fellowship?
    a. Personal expectations (e.g., milestones set for research, skills to learn etc.)
    b. Program expectations (e.g., access to top researchers/scientists, top-notch facilities etc.)
    c. Have these expectations been met? Explain
4. Did you forgo any opportunities in order to pursue the ABCF fellowship? If so, what opportunities?
5. To date, what has been your overall experience with the ABCF Fellowship?
    a. What are the key strengths of the program? Why?
    b. What things you would change with the ABCF program? Why?
    Probe on: application process, on boarding process (housing, visas), language barrier, gender dynamic, training workshops, etc.
    c. What would you add to the program to improve the experience of future ABCF fellows?
6. Specifically about your research, what aspects of the ABCF program would you consider successful?
    a. What aspects are **not** successful?
    b. What factors are contributing to your success or failure? *(probe: prior scientific knowledge, access to research staff, access to support staff, access to research facilities, gender, language barrier)*
7. What specific skills are you gaining from the ABCF fellowship? *(Probe on: analytical skills, lab expertise, scientific writing/publishing etc.)*
    a. How, if at all, have you applied the skills you learned at ABCF to your research?

b. What challenges limit your application of these skills?

8. To date, what has been the impact of the ABCF fellowship on:
    a. Your research (*probe on: research that they had done at BecA-ILRI, current, etc.)*
    b. Your career trajectory (what will you be going back too?)
    c. Your attitude/behaviour as a scientist *(probe on: confidence, time management, productivity etc.)*
9. What benefits have you received as a result of your ABCF fellowship?
    a. Are you gaining any new networks and or research partnerships/collaborations during your time as a fellow? Please clarify.
    b. Are you or your home institution receiving any funding or grants as a result of your time as an ABCF fellow?
    c. Have you received any awards or recognition during your time as an ABCF fellow?
10. Are you applying the skills or knowledge you are acquiring currently to your home institution? *(probe on: workshops/trainings given, communities of practice formed, changes made to curriculum)*
    a. What factors promote your application of these learnings?
    b. What factors inhibit your application of these learnings?
    (Probe on: institutional support, access to funding, access to research facilities, gender dynamics etc.)
    c. How can ABCF and BecA-ILRI provide support to enhance this kind of engagement with your home institution?
11. In your own words, what do you understand to be the objectives of the ABCF program?
    a. In what ways does the ABCF meets these objectives?
    b. In what ways does the ABCF **not** meet these objectives
    c. What improvements can be made to the program to make sure these objectives are met?

    [Facilitator: "The objectives of the ABCF are (1) promote access to world-class research and training facilities (2) build capacity of individuals and institutions to harness the latest biosciences technologies to improve agriculture in Africa (3) Support African scientists' efforts to lead and sustain biosciences research in Africa.]

12. What are some of the critical needs for agriculture researchers in your region?
    a. To what extent is the ABCF program designed to meet these needs?
    b. What improvements can be made to the ABCF program to meet these needs?
13. Given your experience with ABCF to date would you chose to pursue the ABCF fellowship again? Explain

Close out

- Thank you and explain next steps
    - Your recommendations will form part of Dalberg's overall findings and recommendations to BecA-ILRI's leadership team.

Appendix F: Further detailed enclosures

Additional enclosures sent separately to ABCF's Evaluation Reference Group include:

1. Original slides of figure depicted in this report
2. Original research instruments including questionnaires used for the web survey and interview guides for the different stakeholder groups
3. Anonymized raw survey data and analysis of the same
4. Aggregate file with demographic information of ABCF fellows and workshop participants

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