

# AFRICA FOOD SECURITY INITIATIVE



## PARTNERSHIP AND PROJECT UPDATES

### FIRST INTERNATIONAL FOOD SECURITY CONFERENCE – SHOWCASING AFSI

By 2050, it is estimated we will need to feed 9 billion people. Achieving global food security while reconciling demands on the environment is a huge challenge faced by mankind. The 'First International Conference on Global Food Security' was convened to try and better understand the economic, social, biophysical, technological and institutional drivers of current and future global food security. Held in Noordwijkerhout, the Netherlands, between September 29 and October 2, the conference brought together over 600 participants from over 65 countries, representing researchers from agronomy to economics, policy, nutrition and social science.

AFSI was well-represented by Partnership staff from CSIRO and other Australian and African partner institutions. Presentations focused or drawing upon AFSI research included:

- Health impacts on 90 million people: Addressing aflatoxin exposure in eastern Africa
- Monitoring water and nitrate on-farm in Ghana to understand yield gaps
- Enhancing sustainable seed systems of staple crops in West and Central Africa to improve food security
- Improving approaches, design and implementation of research for better food security impact: Insights and lessons from thought leaders
- Exploring national policy pathways to food security in West Africa
- DFAT-CSIRO Africa food security initiative - a research for development partnership

The second conference will be held in New York in 2015.



### AFSI EXPLAINED

To foster a long-term sustainable improvement in African food security, the Australian Government, through the Australian aid program, has increased its investment into Africa via the [Africa Food Security Initiative \(AFSI\)](#). AFSI is focused on lifting food security and agricultural productivity in Africa through joint research, working with and building the capacity of African agricultural organisations, and by enhancing community resilience. The agricultural productivity component of AFSI leverages Australia's unique agricultural and scientific expertise by engaging the [Commonwealth Scientific and Industrial Research Organisation \(CSIRO\)](#) and the [Australian Centre for International Agricultural Research \(ACIAR\)](#) to help African research institutes and farmers address their national food security challenges. This partnership is one initiative within AusAID's broader Africa Program.

The research projects align with the priorities of CAADP<sup>2</sup>, a framework which outlines the African agriculture agenda derived from NEPAD<sup>2</sup>.

<sup>2</sup> CAADP (Comprehensive Africa Agriculture Development Programme) is the agricultural development framework of the New Partnership for Africa's Development (NEPAD). NEPAD is the implementing agency of the African Union (AU) and is responsible for driving economic integration in Africa. <http://www.nepad-caadp.net/>

## RETIREMENT OF BRUCE PENGELLY FROM CSIRO ... BUT NOT FROM AFSI

Bruce Pengelly, AFSI Partnership Leader since its inception in 2009, retired in August after 44 years with CSIRO. From humble beginnings as Junior Technician at the CSIRO Davies Laboratory in Townsville, Bruce's scientific and management career soared. Bruce's passion for overseas developmental work flourished while he was leader of several ACIAR-funded projects – first in South Africa and Zimbabwe – followed by ten years in Indonesia where he worked on three projects to improve smallholder beef production in eastern Indonesia. This was one of the earliest suites of ACIAR-funded projects in Indonesia which took a systems approach to smallholder beef production; new thinking to ACIAR in those days but work which is now recognised as having had a huge impact on the lives of tens of thousands of smallholder farmers.

Bruce's highly-respected management skills were also applied in his role first as Program Leader and then Deputy Chief of the CSIRO Sustainable Ecosystems Division.

In the last four years of his career, Bruce focused again on international developmental work, being instrumental in developing and then leading the Australian aid-CSIRO AFSI Partnership. As Partnership Leader, Bruce ably led a large team including 32 CSIRO staff, university-based colleagues, several contractors, and partners in East and West Africa.

Bruce developed close relationships with many of the 'AFSI family' both in Australia and Africa, many of whom talk fondly of Bruce's many worthy attributes, including not only his valued scientific advice but also the support he has given over the years to strengthening the institutional structures and processes within both BecA and CORAF/WECARD. Being awarded the BecA 'Partner of the Year' in 2012 and then, with Brian Keating and Peter Carberry (current Partnership Leader), the 'Officer of the National Order of Burkina Faso' medal for their contributions to Africa, were two very public indicators of Bruce's success and appreciation in Africa. But there are many less-visible indicators – such as the heartfelt thanks of an African student given the chance of a lifetime through successful PhD candidature thanks to Bruce's help and support – which, while less visible, were no less important to Bruce.



**L-R: Bruce Pengelly with Monica van Wensveen (CSIRO) and Aboubakar Njoya (CORAF/WECARD Director of Programmes)**

After 44 years at CSIRO, Bruce was never going to find it easy to leave us. And he hasn't! He's now back as an Honorary Research Fellow. That's great news for us all and we are enjoying continuing to work with him and benefit from his huge accumulation of skills and knowledge.

## AUSTRALIA AWARDS PROGRAM—A VALUABLE PART OF AFSI

Dr Chris Prideaux (Acting Chief of CSIRO's Division of Animal, Food & Health Sciences, and scientific advisor to AFSI) was in Nairobi July 23-25 to interview shortlisted applicants for agricultural PhDs through the Australia Awards Scholarships program (funded through the Australian aid program).

The Australia Awards Scholarships program provides the opportunity for people from developing countries to undertake fulltime undergraduate or postgraduate study at Australian universities and colleges.



## Australia Awards

The program has been a small but important component of AFSI since the early days of the Partnership. Although not formally connected, there are strong links between the Partnership and the scholarship program, as the program is a good opportunity for students to undertake research with connections to existing Partnership projects.

A number of Masters and PhD scholarship holders are studying in Australia, with current or intended research links to AFSI. These include Vincent Were – a Masters student at UQ, undertaking research linked to the BecA Partnership's *Aflatoxin Project*, and Kodjo Kondo – PhD student at UNE, with links to the CORAF/WECARD Partnership's *Seeds Systems Project*. See separate articles in this edition for Vincent and Kodjo's stories.

AFSI has had particular involvement in the African agricultural PhD program through provision of scientific expertise. Former Partnership Leader, Bruce Pengelly, and Chris Prideaux have both played integral roles in the PhD process – providing scientific advice to the Australian aid program, assessing applications, helping to connect candidates with suitable scholars and institutions in Australia, and interviewing and shortlisting candidates. Other scientists connected to the AFSI Partnership, such as Rob Skilton (BecA/ILRI) and Sidi Sanyang (CORAF/WECARD), have also been involved in the selection process over the past few years.

During July's interviewing process in Nairobi, Chris and the team interviewed candidates from a wide range of African countries and representing fields within both bioscience and social science. All were of a very high calibre. Candidates are currently being informed of the success or otherwise of their applications.

The AAS program is a wonderful opportunity for promising African students to advance their studies in Australia. It's also a great opportunity for AFSI scientists to be actively engaged in shaping the careers and futures of young scientists to underpin agricultural research in Africa. If you know of anyone who could be a potential contender, we urge you to encourage them to consider applying... applications for the 2015 intake are due soon.

For more info on the Australia Awards Scholarships program: <http://www.australiaawardsafrica.org/>

*Article: Caroline Bruce & Chris Prideaux (CSIRO)*

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## TOWARDS AFSI PHASE 3

Following the recent federal election, the Government of Australia is currently considering its strategic, budget and funding priorities, including for its foreign aid program. Detailed information on the funding priorities of the aid program will be provided by the Government in due course.

As part of Machinery of Government changes, the Australian Agency for International Development has been integrated into the Department of Foreign Affairs and Trade (DFAT).

While the precise parameters of the next phase of AFSI are yet to be determined, there has been significant progress in developing a design for Phase 3, following the Partnership's Mid-term Review in 2012. This has included the BecA annual internal review (see separate article), a review of the CORAF partnership project portfolio in Ouagadougou (Burkina Faso) in July, and a Concept Note development workshop in late July at Lake Naivasha for the proposed BecA partnership projects. Further negotiations between DFAT, CSIRO, CORAF/WECARD and BecA/ILRI continue to facilitate the continued promotion of agricultural productivity and food security through the Australian aid program.



## TRAVEL SNIPPETS: A SNAPSHOT OF SOME RECENT TRIPS ...

- Ten CSIRO scientists both within and external to the BecA Partnership (co-incidentally in Nairobi for the Agricultural Innovation Systems in Africa workshop), plus Mary Fletcher (UQ/QAAFI) attended the annual internal BecA Partnership review from June 2-7 at Lake Naivasha, Kenya. Several Partnership members also held project or management meetings prior to or after the review, focussed on developing plans for a potential Phase 3. Chris Prideaux was also involved in Australia Awards Scholarships interviews in Nairobi, and Peter Carberry attended the Partnership's Quadrilateral meeting.
- AFSI Partnership Leader, Peter Carberry, and Partnership Coordinator, Caroline Bruce, met in Dakar June 9-11 with members of the Transition Taskforce (Dr Dominique Hounkonnou, Dr Paco Séréme, Dr Aboubakar Njoya). The Transition Taskforce was formed to assess the CORAF/WECARD Partnership's project portfolio and make recommendations for Phase 3 projects. Amelia Addison (Australian aid, Accra) also attended. Caroline remained in Dakar to June 14, to work with CORAF/WECARD Partnership Coordinator, Issoufou Kollo, on Partnership reporting.
- CSIRO's Richard Stirzaker was in Ghana July 14-20 as part of an ongoing process of mentorship for the *Crops-Small Ruminants Project* within the CORAF/WECARD Partnership. He visited some of the project's fieldsites, worked with team members in Kumasi and southern Ghana, and participated in project team discussions at the Sustainable Intensification Systems Workshop, Accra.
- Peter Carberry and Caroline Bruce were in Ouagadougou, Burkina Faso from July 25 to take part in the Transition Taskforce's review of the 7 projects within the CORAF/WECARD Partnership. Staff from Australian aid in Accra (Amelia Addison) and Canberra (Naomi Dumbrell, Kris Hendrickx, Jim Woodhill) attended most of the review. Peter also attended an Innovation Platform for the *Seeds Systems Project*. After the review, Caroline and Peter met with Australian aid and DFAT staff in Accra, including HoM, Ms Joanna Adamson.
- *Policy Pathways for Food Security (PPFS) Project* members Ashley Sparrow, Neil McKenzie, Keith Bristow, David Summers (all CSIRO) and Rohan Nelson (Uni of Tasmania) were in Ouagadougou late July with representatives from CORAF/WECARD and representatives from the NARIs of Senegal, Niger and Burkina Faso for discussions to advance the project design. They also attended relevant parts of the Transition Taskforce review.
- CSIRO's Henry Sabarez was in Nairobi 5-16 August to work with the *Amaranth Project* team on food dryer technology at the Jomo Kenyatta Uni of Technology (JKUAT).
- Tony Webster (CSIRO) visited Tamale (Ghana) 7-11 September for the Seeds Systems Project, to help collate data from field trials from 2011 to 2013, inspect field sites, model crop yields from selected sites in an interactive session with a small group of farmers and value chain actors, and discuss general project progress including implementation and progress of IPs.
- Neil McKenzie (CSIRO, Montpellier) visited Ouagadougou (Burkina Faso) and Dakar (Senegal) from 8 - 13 September for the *Policy Pathways for Food Security Project (PPFS)* to finalise project agreements with collaborators and discuss methods for 1) estimating potential agricultural production in Burkina Faso based on a range of economic and environmental outlooks, and 2) assessing the impact of the planned government innovation platform on policy pathways for food security in West Africa.
- 6-12 October, CSIRO scientists Chris Prideaux and Jocelyn Davies, plus Partnership Leader Peter Carberry attended a facilitated Concept Note development workshop at Naivasha, Kenya. A range of stakeholders attended, including development/impact partners who were identified as essential to the development of the projects. Prior to this workshop, Jocelyn Davies also attended the ASF Project's phase 2 closing workshop.

## NEW WIVES, HOUSES, AND SCHOOL FOR CHILDREN – IMPROVED LIVELIHOODS IN MALI DUE TO AFSI PROJECTS

Two CORAF/WECARD Partnership projects are contributing to improved livelihoods for villagers of *Siramana* in the Malian region of Sikasso.

The *Seeds Systems Project* is implemented across four countries - Mali, Burkina Faso, Ghana and Cameroon. In the village of Siramana, field trials are growing three major crops : maize, sorghum and groundnut. The living conditions of the villagers of Siramana have improved thanks to the project.

Dougoumbéré Bengaly is a sorghum producer who has benefitted from the project. Before the project, he did not know much about the different varieties of sorghum, as he and others in his village grew maize and millet. The high sorghum yields demonstrated by the project's local trials convinced Dougoumbéré to switch to growing sorghum. He says he has learned a lot due to the project, and is proud of the 2.5 tonnes per hectare of sorghum he now produces. With the higher income from sorghum, his life has changed for the better and has helped him to afford a new wife and motorbike, while also allowing him to send his children to school.

He is particularly proud of the new house he has been able to build. “Before, I used to sleep in a *banco* house – it is a traditional house made from mudbrick. Now, I have built a modern house and I don’t need to worry when it rains – the walls are concrete.”

The project has also benefitted Wassa Sanogo. Last year, she had the best yield of groundnut in the region – and she puts that down to new varieties and methods trialled by the project. “Before the project, I used to grow only one local variety of groundnut and my yield was low. Now, I grow six different types of groundnut and have increased my income. With the extra money, I can now send my two daughters to school – one to the primary school in Fama and the older to the university in Bamako”.

Nedjo Bengaly's life has also changed for the better – thanks to the *Ecological Intensification Project*, which also has field trials in Siramana. “The project is a *baraka* (blessing) for us in Siramana. It has brought us 14 new varieties of maize and other varieties of cowpea and sorghum. We have learnt new techniques and innovations to improve our yield and adapt to climate change”.



Groundnut farmer, Wassa Sanogo



L-R: Dougoumbéré and Nedjo Bengaly

Nedjo's maize yields improved after he adopted new varieties and techniques demonstrated by the project's field trials. He now harvests 4 tonnes per hectare, allowing him to not only feed his family but also to sell part of the harvest. His annual income has doubled, helping him to install a new zinc ceiling for his house, buy a new motorbike, TV and satellite dish, and also allowing him and his eldest son to marry new wives.

Authors: Khady Lo (CORAF/WECARD),  
Dougoumbéré Bengaly, Nedjo Bengaly & Wassa Sanogo



## Q&A: KODJO KONDO

*Mr Kodjo Kondo is an Agricultural Economist from Togo, studying a PhD in Australia through the Australia Awards Scholarships program. He plans to integrate his PhD research into the CORAF/WECARD Partnership's Seeds Systems Project. He shares his story with us:*

### What drew you to a career in agriculture?

I grew up in a rural area some 130 kilometres from Togo's capital, Lomé. My parents had a typical farm, growing cereals, fruit and vegetables suited to the tropical environment – like maize, beans, okra, oranges and cotton. We also raised a few chickens and goats. It was hard work, but I used to enjoy helping my family in the fields and harvesting fresh vegetables and fruit after a good season. Sometimes though, harvests failed due to drought or floods and we'd all lack food for a period and have to significantly depend on food aid from the local social relief services.



**Agronomic evaluation of on-farm trials in Central Togo, 2002 (Kodjo far R)**

These experiences inspired in me a passion for agriculture and also a desire to do something to help the millions of African smallholder farmers – reduce the chances of them suffering from failed harvests, like we did.

### What path did you follow?

I studied a BSc in Agriculture at the University of Lomé in Togo from 1995 to 2000, then an MSc in Projects Analysis at the Faculty of Economics at the University of Rennes 1 in France in 2008/2009.

My first job was with CREMA (Centre de Recherche et d'Essai des Modèles d'Autopromotion) - a local NGO in Togo devoted to local communities' development. There, a big part of my role involved working with rural communities to understand envi-

ronmental issues and together work out and implement ways to reduce harmful practices. For example, tree clearing for firewood and crop expansion was a big problem in the area – it resulted in a lot of erosion during floods and windstorms. So, we'd look at the problem, talk about the value of trees for holding soil together, and look at ways to preserve existing trees. We also planted new trees, which the locals nurture and use as a sustainable resource – so they have an ongoing supply of firewood, but the soil also benefits because the trees aren't cut down. With CREMA, I also trained farmers in best farm management practices, conducted participatory on-farm

trials on optimal plant population and profitable rates of fertilizer, and organized field visits, open days and study trips with newly formed farmers' cooperatives.

Two years later, I joined the International Fertilizer Development Centre (IFDC), first in Togo then in Mali where I developed compe-

tences in Monitoring and Evaluation (M&E) and established a participatory M&E system for an agribusiness value chain project which covered seven West African countries.

Three years ago, I moved on to the International Crop Research Institute for the Semi-Arid Tropics (ICRISAT) in Mali to work as regional M&E Specialist on the USAID-funded West Africa Seed Alliance/Seeds Project (WASA-SP; a project run through ICRISAT, CNFA and The Seed Center of Iowa State University). I also helped set up the M&E system for the CORAF/WECARD Partnership's *Seeds Systems Project*. Then I applied and was accepted for the Australia Awards scholarship, and have been

with the University of New England in Armidale since May 2012.

#### What is your PhD about?

My overall goal is to develop my competences in rigorous impact evaluation techniques using mixed methods in addition to my current expertise in M&E. With this aim in mind, I am gearing my PhD towards improved technologies adoption and impact studies, together with efficiency and productivity analysis.

The first year of the PhD program (June 2012 to June 2013) focused on courses to strengthen knowledge important in this area - like theoretical and analytical skills in econometric analyses, survey design, experimental and quasi-experimental evaluation designs and productivity and efficiency analysis.

I am currently developing a research proposal for the remaining part of my PhD. I want it to be about assessing the determinants and impact of the adoption of improved seed varieties and technologies on crop productivity in West and Central Africa. This is really relevant to the current CORAF/WECARD Partnership's *Seeds Systems Project*, and also to the current Harnessing Opportunities for Productivity Enhancement of Sorghum and Millet in Sub-Saharan Africa and South Asia (HOPE) project funded by the Bill & Melinda Gate Foundation, so I'd like to align my research with those two programs, and have been talking with CSIRO's Peter Carberry and Tony Webster about options for alignment with the *Seeds Systems Project*.

#### Why is adoption and uptake of improved seed a particular problem in West Africa?

Uptake of improved seeds is very important to boost production in the small-scale farming systems in West Africa – crop productivity can increase by up to 30% by adoption of improved seeds alone. To help achieve food security and poverty alleviation in rural areas, focus must therefore be on the development and dissemination of improved seed varieties.

A lot of effort and money has gone into developing new and improved seed varieties over the past sev-

eral decades within the region, for species like maize, sorghum, millet, cowpea and groundnuts. Efforts have also been made in recent years to bring new varieties to farmers – via a range of demand-creation activities and development of seed producers and agro-dealers networks. However, the lack and sometimes low quality of breeder and foundation seeds,



**L-R: Kodjo, Dr George E. Battese (a leader in Kodjo's church, Armidale), Samuel and Carole Kondo**

the presence of 'fake' (non-certified) seeds in the markets and non-integration of the varieties developed into specific value chains still hamper a large uptake of improved varieties by farmers. Some of these 'roadblocks' along the value chain are being identified as part of the *Seeds Systems Project*, but it's a big issue which needs further research to identify and address the full suite of contributing factors. We also need to look more closely at the impact of the demand-creation activities (demonstrations, field days, distribution of mini-packs of seeds, media, seed fairs, etc.) on the decision by farmers to adopt improved seeds ... or not.

#### What do you plan to do once you've finished your PhD?

Funding agencies are increasingly and rightly demanding information on the outcomes of their programs. In Africa, there is a huge demand for performance and impact information to guide evidence-based decision making. I would like to play a major role in this field after completing my PhD in Australia by joining a food security and agricultural development program as Evaluation Specialist, preferably in the Eastern or Southern Africa Region.

This will not only help me expand my professional network and allow me to apply my knowledge to other regions in Africa, but it will also help the whole family to embrace another new culture (as we do enjoy it!) and allow our son to continue growing in an English-speaking environment. After some additional years in development work, we plan to go back to Togo to establish and run private agricultural businesses and a consulting agency.

You brought your wife and young son to Armidale with you. Have they enjoyed living in such a different place?

It was a big change for them – a very different environment, different culture and a different language! But they have settled in well and my wife and our little boy Samuel are learning English. It's sometimes hard being so far from home, but the local Armidale Community Church has been a big help and a place to meet locals.

It's also been helpful having a lot of other African students based at the university – we help each other a lot. Overall though, it's a wonderful experience for the whole family and we're very grateful to the Australian aid program and the University of New England for this opportunity.

*Authors: Kodjo Kondo (UNE) & Caroline Bruce (CSIRO)*

## ***POLICY PATHWAYS PROJECT***

Rohan Nelson (University of Tasmania and CSIRO joint appointee), Neil McKenzie, Ashley Sparrow, Keith Bristow and David Summers (all CSIRO) visited Ouagadougou in late July and early August for the *Policy Pathways for Food Security (PPFS) Project*. The original intention of the visit was to help facilitate the first meeting of the Innovation Platform (IP) of Burkinabé policy advisors within the project. However, resolution of outstanding institutional matters following the May 2013 transition of the project in to the AFSI 'umbrella' in West Africa were needed before the project could progress.

After presentation in July to the CORAF/WECARD Partnership's Transition Taskforce of an outline of project objectives and approaches, a meeting of staff from CSIRO, CORAF/WECARD and INERA (Burkina Faso's national agricultural research institute) agreed to a pathway of actions to identify, clarify and resolve the process and institutional needs and expectations of all parties.

To conform with CORAF/WECARD requirements, the project team subsequently rewrote its design document and submitted a formal standard-format commissioned project proposal to CORAF/WECARD's Science and Technology Committee (STC). The proposal, led by INERA, included INRAN and ISRA (Niger's and Senegal's national agricultural research institutes) as partners – thus meeting with CORAF/WECARD's criterion for participation by at least three countries within each project.

For the July/August meeting, the head of INERA, Prof. François Lompo, invited his colleagues in Niger and Senegal to nominate representatives who subsequently travelled to Ouagadougou to participate in discussions to further project design. Dr Sibiri Jean-Baptiste Taonda (INERA) chaired several long days of meetings during which innovative activity proposals were developed, focusing on awareness and scoping for these two new partner countries.

For Burkina Faso, where awareness of the potential of participatory policy development is already high and some developmental work is already in place, a preliminary mapping of institutions involved in food security led to a more complex proposal for activities to support a high-level IP. The work culminated in a complete draft of a CORAF/WECARD project proposal, including logframe and budget. Subsequently this draft has been edited, reviewed and submitted for consideration during November's STC meeting in Dakar.

Beyond significantly advancing the project's proposal, the visit to Ouagadougou also involved two opportunistic, and extremely positive, visits to research groups in Ouagadougou – the spatial analysis laboratory of INERA and BUNASOL, the National Bureau for Soil Science. In both cases, the Australian visitors were impressed by the expertise and dedication of the Burkinabé research teams and commented on the enormous potential for productive future collaboration.

*Author: Ashley Sparrow (CSIRO)*



## A BETTER LIFESTYLE FOR SEYDOU ADAMA TRAORÉ OF KOLOKANI

Seydou Adama Traoré is a 27 year old Malian. He is an agro-dealer and member of the *Seeds Systems Project's* Innovation Platform (IP) in Kolokani. Other IP members include other agro-dealers, seed producers, extension agents, traders, microfinance organisations and farmers.

Seydou owns a store where he sells fertilizers, pesticides, seeds and others useful inputs for agriculture. Before the project established the IP in Kolokani, he used to sell only pesticides and made little profit. But since the implementation of the IP, he has played an important role in the IP's meetings – discussing and sharing ideas - and says that this has allowed him to both increase the number of his clients and diversity of products he offers for sale. His profit has also doubled.



Increased profits have led to a change of lifestyle. Seydou has bought his own plot of land and plans to build a house. He has also bought two machines for the packaging of his products, a generator, a TV and a satellite dish with over 500 channels. In addition, he now employs ten people to handle and sort seed. Before the establishment of the IP, he could employ only three people and his low income did not allow him to buy equipment.

Seydou acknowledges the value of the IP not just in improving his own livelihood, but that of several others in Kolokani, and he hopes the IP will continue to operate in to the future.

*Authors: Khady Lo (CORAF/WECARD) & Seydou Adama Traoré*

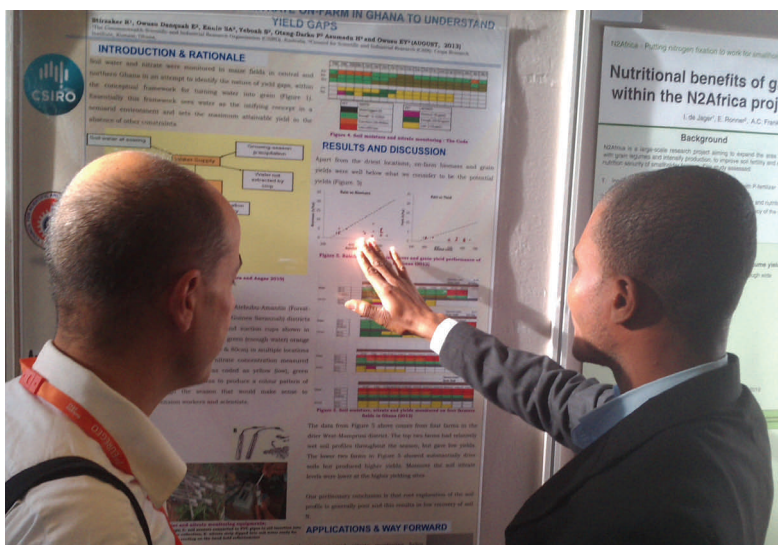


Seydou Adama Traoré proudly shows the wider variety of agricultural products he now sells in his shop

## YIELD GAPS – AN INTRIGUING FINDING

Eric Owusu Danquah presented a poster on “Yield Gaps” at the First International Conference on Global Food Security held in the Netherlands from 29 September - 2 October 2013. Yield gaps represent the difference in yield that the farmer actually obtains, compared to what should be possible in the same environment.

Eric is part of the Ghana country team of the CORAF/WECARD Partnership’s *Crops/Small Ruminants Project*. The study was conducted on ten farms in the Atebubu-Amantin (the wetter Forest-Savannah transition) and West-Mamprusi (the drier Guinea Savannah) districts of Ghana. Current on-farm maize yields are in the range of 1 to 2.5 t/ha in both locations. These yields are one half to one third of what they could be, and there is widespread belief that the problem is due either to i) lack of rain or ii) lack of fertiliser.



Eric Owusu Danquah with a conference delegate

To test these assumptions, the team installed soil moisture sensors and measured the water stress that the crops were experiencing throughout the season. Contrary to our expectations, the soils were wet for most of the season, even in the drier locations. However the most startling result was that almost no crops were able to access water from the subsoil, so when the rainy season did stop, the crops quickly ran out of water.

The team also installed equipment that could extract a soil water sample from which nitrate measurements were made. Soil nitrate levels were usually low, irrespective of whether the farmers applied fertiliser or not. Moreover the few farms where we did measure satisfactory amounts of nitrate were not amongst the highest yielding farms.

Yields were low in the wetter and drier regions and we suspect this was for different reasons. In general, the wetter sites grew less crop biomass, but were able to convert an acceptable amount of this biomass to grain.

The low biomass was probably due to rapid leaching of nitrate through the soil profile before the roots could access it. The drier areas grew larger crops, but did not convert these larger crops into more grain. The problem appears to be related to the rapid end to the season, so the crops were stressed during the final part of the grain filling period.

In both cases the root cause of the problem seems to be with the roots. It appears that rooting depth is being inhibited by some factor we do not yet understand. Until we can find this out, yields are likely to remain lower than expected.



Richard Stirzaker (R) discusses yield differences with Sidi Sanyang (CORAF/WECARD)

Author: Richard Stirzaker (CSIRO)



## MOLECULAR STUDY MAKES A DIFFERENCE TO CAVY FARMERS IN EASTERN DR CONGO

As part of the BecA Partnership's *Cavies Project*, a meeting was held of the Regional Cavy Innovation Platform (IP) in Kalehe *Territoire* of Sud-Kivu Province, Democratic Republic of the Congo (DRC). At the meeting, Bertin Bisimwa, a former BecA ABCF fellow, explained to farmers and other participants the consequences of his findings from the molecular studies of cavies in three *territoires* of the province, for their keeping of this small animal.

Farmers had been concerned about him taking blood samples; they wondered what would happen to their animals. Bertin reassured them that his animals weren't at any risk from the procedure. But he explained to them that he thoroughly studied the blood – and the DNA within – in the BecA laboratory in Nairobi, to assess the degree of inbreeding and the general genetic diversity found in the cavy populations of the region.

He brought two important messages to the IP meeting: 1) inbreeding is high and 2) it has serious negative consequences such as decreased litter size, less litter frequency, kids with inferior birth weight, increased disease susceptibility, and death of animals at younger ages.

He also found that there are two genetically quite different groups of cavies in the region; one group north of the provincial capital town of Bukavu (Kalehe and Kabare *territoires*) and one group south of it (Walungu *territoire*). This is good news because we may already have part of the solution to inbreeding - people from these different areas may start exchanging progenitors to increase genetic diversity. The IP is helping to establish such links and facilitate the exchanges.



**Bertin Bisimwa, former Africa Biosciences Challenge Fund (ABCF) fellow at the BecA-ILRI Hub, translates his research results into accessible language with cavy keepers in Kalehe, eastern DRC (photo by BLMaass)**

The regional Cavy IP in Sud-Kivu was established in October 2012. It comprises a variety of different stakeholders along the cavy value chain, including producer representatives from four different villages where the project has research sites, traders, NGOs, a micro-credit organization and a radio station. The IP functions by bringing together these actors along the value chain to identify challenges and knowledge gaps and develop mutual possible solutions and opportunities for improvement and sustainability.

Bertin reflects on his experience: "The meeting of the IP in Kalehe was a new experience for me. As a researcher doing cutting edge science in the laboratory, I had to consider farmers' perceptions and challenges and explain my research in a language they understand. I returned happy from that day with the Platform because I could really understand that my laboratory study can make a difference to the cavy farmers I met".

*Authors: Brigitte Maass, Bertin Bisimwa and Wanjiku Chiuri (Cavies Project members)*



## BECA PARTNERSHIP ANNUAL INTERNAL REVIEW

The BecA Partnership's annual internal review was held 2-7 June at beautiful Lake Naivasha, Kenya. This was the opportunity to present and discuss progress and challenges in Phase 2 projects and ideas and opportunities for Phase 3 projects. The processes and timelines for the 'transition period' between the end of Phase 2 and expected commencement of Phase 3 were presented, and a small-groups session allowed project teams to delve in to 'bioscience for impact' – discussing what this means, sharing experiences and identifying areas where project team members considered additional support would be helpful in the lead up to Phase 3.

Beyond project representatives, the review was attended also by staff from BecA/ILRI, CSIRO and Australian aid program staff in Nairobi. As always, the BecA team (especially Leah Ndungu and Rachel Njunge) did a wonderful job of organising the week, which included a farewell 'safari style' BBQ for Bruce on the shores of Lake Naivasha and enjoyed by all.



L-R: Edward Okoth (ASF Project), Appolinaire Djikeng (BecA Hub Director), Bruce Pengelly (AFSI Partnership Leader) and Jagger Harvey (CAAREA Project Leader) toast Bruce at his retirement BBQ organised by the BecA-ILRI Hub

## COMMUNICATIONS SNIPPETS...

- With support from the [CGIAR Research Program on Climate Change Agriculture and Food Security \(CCAFS\)](#), the [BecA-ILRI Hub](#) highlighted the nutritional benefits and potential income gains to be made from growing and consuming amaranth on the [Shamba Shape-Up TV](#) show. This program, which targets rural farmers with affordable and sustainable farm improvements, is aired on Citizen TV in East Africa and attracts an audience of over 11 million viewers.
  - Watch the TV episode on [growing amaranth for improved nutrition and climate change mitigation](#) – (shown in weekend prime time slots in Kenya and Tanzania, in English and Swahili)
- The African swine fever project team has had some media in the [East African newspaper](#) (the focus being on the new vaccine work) and the new project video is live on [Youtube](#).
- The Cavies Project featured in the [September issue of Agridape Magazine](#) (pages 29-31, in French) featuring IAR4D cases. The value of cavies for nutrition, income generation and in post-conflict DRC was highlighted by the [New Agricturist](#).

## Q&A: TIMOTHY HALL

*Timothy Hall joined the BecA-ILRI Hub in April 2013 on a 12-month volunteer assignment as part of the Australian Youth Ambassadors for Development (AYAD) program. He is now six months into his assignment; find out what his experiences have been so far in providing communication support to the BecA-ILRI Hub.*



There are so many different opportunities open to AYAD volunteers worldwide, what made you want to volunteer at the BecA-ILRI Hub specifically?

I applied for this position due to my interest in food security and communications in development. Although I have recently trained as a graphic designer and worked in media relations, most of my work background is in research and politics so science communications was a new challenge!

What have you achieved in the six months that you have been at the Hub?

In my six months with the Hub I have assisted in strengthening the organization's communication abilities and public profile across a range of media. This has included establishing a social media presence for the Hub, helping to redesign and maintain a new website, redeveloping the BecA-ILRI Hub Brochure, producing project information posters, and producing videos profiling aspects of the Hub's work.

What are the highlights of your work at BecA so far?

Supporting the communication needs of the Australian-funded African *Swine Fever (ASF) Epidemiology Project* has had some exciting moments. I had the opportunity to travel to Busia in western Kenya, right on the border with Uganda, to make a short film on the project. I was actually able to take some footage of Uganda, while standing on the Kenya side. I also produced an information booklet summing up the project's findings for their closing workshop.

What can we expect to see from you in the future?

I am in the process of producing a video about the Africa Biosciences Challenge Fund, a competitive fellowship administered by the BecA-ILRI Hub that allows scientists from across Africa access to the Hub's facilities and training whilst completing a research project. It is my hope that the film will demonstrate the scope

and diversity of research undertaken, and the facilities and opportunities for professional development that the Hub provides to ABCF fellows.

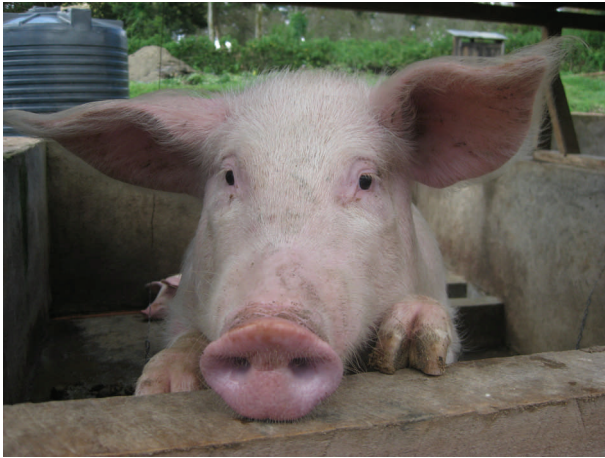


Other upcoming work includes developing visual media for a CGIAR-wide briefing on aflatoxin research and reduction, organized by BecA and ILRI. Preparing for this will include taking photos and getting video footage of farms in regional Kenya that are participating in the Hub's Capacity and Action for Aflatoxin Reduction in Eastern Africa (CAAREA) program.

Tim (C) with two participants of the BecA-ILRI Introduction to Molecular Biology and Bioinformatics annual training workshop

*Compiled by Ethel Makila & Tim Hall (BecA-ILRI Hub)*

## NEW UNDERSTANDING ABOUT AFRICAN SWINE FEVER EPIDEMIOLOGY ON THE UGANDA-KENYA BORDER



Improved understanding of African Swine Fever (ASF) outbreaks and impacts is emerging from preliminary analysis of data from an integrated field study (2012/13) in the *ASF Epidemiology Project*. Insights from the field study are a foundation for designing interventions to reduce ASF risk among smallholder pig producers. The project is also contributing to international effort on vaccine development.

The project's field study area is on the Uganda-Kenya border, extending 75 km north from Lake Victoria - a priority region for improving trans-boundary disease surveillance and control. The region has been identified by veterinary authorities in Kenya to be characterized by frequent out-

breaks that often lead to further outbreaks towards the central parts of the country, probably associated with movement of pigs and pig products to the urban markets.

A cross sectional study (July-November 2012) surveyed 683 pig keeping households in 38 villages. 1150 pigs from surveyed households were measured and sampled (blood, serum, faeces). A longitudinal study (December 2012-June 2013) followed a sub-sample of 120 households and pigs involving repeat household surveys and pig sampling about 3 months and 6 months after the cross-sectional survey. The project team has also sampled pigs opportunistically during ASF outbreaks in the region, interviewed butchers and others involved in pig trading, and held 24 focus groups in 13 villages to test some preliminary findings. Analyses of these data are applying complementary tools from molecular biology, veterinary science, epidemiology, mathematics and social science. The results reported here are preliminary (as at June 2013).

### ASF incidence and impact

61% of farmers interviewed said that disease is the biggest risk to their investment in pigs. 90% had heard of ASF and 8.2% said they had ASF on their farm in the year prior to the cross-sectional survey. 17% of pigs that had been owned by surveyed households in this period died before sale or other disposal. For about half these pigs, interviewees described clinical signs that indicate ASF.

The project team confirmed three ASF outbreaks in the study region between July 2012 and March 2013. This confirmation was obtained by sampling blood and other tissues and laboratory testing for the virus DNA. The project team heard of 12 outbreaks in or near the study area during field work. They observed that outbreaks are short-lived: within very few days all pigs in villages (that the team heard were experiencing outbreaks) were either dead and their carcasses disposed of, or had been sold for slaughter. This made gathering more samples from ASF infected pigs difficult.

### Causes of ASF outbreaks in the field study area

The hypothesis that guided the project's field study design is that 'carrier pigs' maintain ASF virus in the field study area between outbreaks. However despite the high incidence of ASF outbreaks in the field study area, screening for the virus in blood samples from pigs on farms has not yet found virus positive pigs, except during active outbreaks. This means that carrier pigs are apparently not common. The project team learned this by analysing all pig blood and serum samples from the cross-sectional survey using two different protocols; 1) Real Time PCR on magnetic bead extracted samples in the Busia lab, within the field study area, and 2) conventional PCR on purified DNA samples extracted using a Qiagen kit in the ILRI Nairobi lab.



Only one sampled pig tested positive for antibodies against the virus, and retesting is scheduled to check this is a valid result. These results do not rule out the possibility that carrier pigs maintain the virus in the study area, as the virus could be sequestered in pig tissues rather than in blood. Tissue sampling of pigs is still in progress to investigate this refined hypothesis. Results will further improve understanding of whether carrier pigs exist in the area and maintain the virus between outbreaks, and of conditions that would convert these carrier pigs from latent states to active shedding of the virus and infecting healthy pigs.

Soft ticks (*Ornithodoros* spp) may be a factor in transmission of ASF virus amongst pigs in the study area. These ticks are considered to be the vector that originally spread the ASF virus from warthogs to domestic pigs and they are implicated in its spread amongst domestic pigs in other regions. The project team found that 37% of 232 pigs tested from the Kenyan part of the study area tested positive for exposure to *Ornithodoros moubata* ticks. However, until these ticks are caught and tested it will not be clear if they are actually carrying ASF virus and spreading it between domestic pigs in the area. Genetic characterization of any virus infections present in the ticks would provide evidence for any associations between the tick viruses and outbreaks observed in the study area.



**The curious pig, tethered to prevent it roaming, wears an ear-tag that shows it has been sampled by the ASF epidemiology project. In the background, farmers from Alupe B village, Kenya, participate in a focus group discussing biosecurity measures against ASF. [Photo Jocelyn Davies]**

Sale of pigs for slaughter during ASF outbreaks can readily spread infection to other pigs through direct contact between live pigs or through live pigs coming into contact with meat or slaughter waste from infected pigs. Farmers in 16 sampled villages reported they had sold pigs for slaughter during ASF outbreaks in the 12 months prior to the cross sectional survey. Seven farmers had pigs on their farm that they said showed signs of ASF infection at the time of sale.

Farmers perceive they are behaving rationally in selling their pigs to realize their financial value, rather than seeing the pigs die of ASF. In addition, eating the meat of infected pigs is not known to present any risk

to people. However there is a risk to the public good through spread of ASF outbreaks. The project has isolated ASF virus from pig blood samples collected from the outbreaks and at slaughter slabs in the study area. There is high prevalence of the ASF virus compared to blood samples from cross-sectional survey on farms. It appears that infected animals that are recognized early by farmers are sold to unsuspecting butchers, leads to spread of the virus off farm and potentially to other live pigs.

Containing outbreaks through quarantine is slow and is hindered by slow confirmation of diagnosis. The project has confirmed ASF virus presence/absence in less than 2 hours by running real time PCR in a pen side approach on-farm. In the ASF project, this has been in collaboration with Dr Neil LeBlanc of the Swedish National Veterinary Institute. However, capability and cost constraints will need to be overcome in order for the rapid diagnosis to be applied routinely in a way that can inform Veterinary Officers' decisions about quarantine of ASF outbreak areas.

## Pig keeping livelihoods on smallholder farms

30% of farm households in the field study area keep pigs. Sampled pig-keeping households own an average of 2.4 pigs (with a minimum of 1 and a maximum of 25 pigs). There are four livelihood strategies relating to pig-rearing apparent among these households and each surveyed farm engages in one or more of these strategies:

- Breeding piglets for sale to other farmers, earning USD 10 (Uganda) or USD 13 (Kenya) on average per piglet
- Rearing sub-adults for sale to butchers, earning USD 23 (Uganda) or USD 36 (Kenya) on average per animal after 5-7 months on farm
- Boar service
- Providing land for agistment

Overall, project data indicate that average household income varies widely between the sampled villages and within each sampled village, that pig keeping income is very low, and that poorer households are most reliant on pigs for income.

Almost all farmer interviewees (95%) said they keep pigs for cash income. However just over half the farmers who had owned pigs in the year prior to survey reported no income from pigs during that period – this is partly due to the dynamics of pig-keeping.

Householders tend to move in and out of pig keeping, influenced by the availability of piglets and feed. Seasonal food shortages for households and their pigs (January to July) accelerate the rate of pig sales. Hence some households had no pigs at the right size/age to sell during that period. Other cited reasons for no income include premature death of pigs, from ASF or other factors.

Of the households that did report income from their pigs, the median household income from pigs was \$20. The most that any surveyed household earned was \$923 and only 14% earned over \$100 in the previous year.

Women do much of the day to day care of pigs in the households we surveyed. In over 70% of households, this work is done only by women and in 20% it involves men and women. Women own pigs and make decisions about pig purchase in just over 30% of households and these roles are collaborative between men and women in about 25% of households.

Most pig trade is within the same village. 85% of trades are with someone known to the pig owner. Trades to 'strangers' based further afield are relatively more prevalent during ASF outbreaks. Farmers in 10 sampled villages sold pigs across the Uganda-Kenya border.

## Reducing ASF risk to smallholders

Biosecurity is a key strategy to reduce ASF risk and is absent on almost all farms surveyed by the team. Some farmers say that given advice and support, they could work together to adopt our recommended simple biosecurity practices (see previous newsletter edition for biosecurity recommendations provided by the project team). Other farmers are not confident that financial returns from pig sales will cover the extra costs involved in implementing biosecurity measures.

Managing ASF risk needs incentives for farmers to report suspected ASF outbreaks rather than selling their pigs, and better capability for rapid confirmation of ASF diagnosis and rapid quarantine response. We hope to apply the insights gained from this project for better management of the impacts of ASF and increased pig production in the study region and beyond, in partnership with project stakeholders and other key innovators.

*Authors: Edward Okoth, Richard Bishop & Jocelyn Davies, drawing on analyses by Mike Barongo, Jacqueline Kasiiti, Selestine Naliaka, Noeline Nantima and Cynthia Onzere.*

## VINCENT WERE—MOVING ON...

*Vincent Were was an Africa Biosciences Challenge Fund (ABCF) Fellow at the BecA Hub in 2011. He then received an Australia Awards scholarship to study a Masters of Biotechnology at the University of Queensland from January 2012. He is on the move again – heading to the UK to undertake a PhD. He will be sorely missed by AFSI. Here, Vincent tells us about his recent work and plans for the future...*

“For the past 8 months, I have been involved in a project to characterize fungal strains isolated from Kenyan maize kernels – as part of the BecA Partnership’s *Aflatoxin Project* and to better understand the huge problem of mycotoxins in maize.

A number of strains were detected: out of the 15 isolates obtained, 8 were aflatoxin producers and were confirmed as *Aspergillus flavus* morphologically and through sequencing. Six isolates were identified as *Penicillium* and were non-producers and one isolate was identified as *Fusarium* – a *fumonisin* producer.

*Penicillium* and *Fusarium* recorded antagonistic effects on the growth of *A. flavus* and led to a 57-98 % reduction in aflatoxins production. This work is still under investigation but holds huge potential - if this effect is confirmed, *Penicillium* can be further investigated and tested for use in biological control of aflatoxins.

Four sets of primers were used to characterize the isolates using q-PCR (quantitative polymerase chain reaction). The primers were optimized to work under the same conditions and will be used to develop a multiplex q-PCR method to simultaneously detect and quantify all the fungal contaminants, estimate which percentage of the total fungal load are *A.*

*flavus* and *A. parasiticus* and to determine what percentage are aflatoxins producers in food crops using a single assay. I am currently finalizing my research project and hope to graduate on the 6th of December this year.

In September this year, I was interviewed for the Halpin Scholarship - part of the Biotechnology and Biological Sciences Research Council/Gates project PhD program at the University of Exeter UK. My application was successful, and I expect to join Professor Nick Tablot's research group in December

2013 or January 2014 for a 4-yr period, after completion of my Masters studies. As part of my PhD, I will be studying the biology of rice infection by *Magnaporthe oryzae* and ways of incorporating durable resistance into NERICA rice varieties. I will be involved in SNP chip hybridization experiments and carry out fine-scale resistance gene mapping with an aim to isolate at least two more resistant genes.

I would like to express my gratitude to everyone who supported me through this journey - Dr Mary Fletcher, Dr Yasmina Sultanbawa and Dr Jagger Harvey for the advice, corrections and encouragements. I

would also like to extend my gratitude to the Australian aid program for this opportunity to study and advance in my career, the University of Queensland’s School of Chemistry and Molecular Biosciences, the Queensland Alliance for Agriculture and Food Innovation (QAAFI), the *Aflatoxin Project* and BecA for the unending support.

Thank you all.”

*Author: Vincent Were (UQ)*





## FARMERS INTRODUCED TO NEW HIGH-YIELDING VARIETIES OF AMARANTH AT AVRDC

It was a lively day in the field among familiar crops when AVRDC - The World Vegetable Centre - welcomed farmers to attend a *Field Day for Traditional African Vegetables* on 21 June 2013 at the Regional Centre for Africa (RCA) in Arusha, Tanzania. The event served as a technology promotion activity for both the BecA Partnership's *Amaranth Project* and the Horticulture Collaborative Research Support Program's (HortCRSP) African Indigenous Vegetables project. Both projects focus on African leafy vegetables, with the BecA Partnership project exclusively dealing with grain and vegetable amaranth, and HortCRSP on several traditional leafy vegetables.

A total of 149 farmers (74 women and 75 men) from six villages in the Arusha and Arumeru districts participated in the day-long event organized by AVRDC Vegetable Breeder Dr. Fekadu Dinssa, Socioeconomist Dr. Victor Afari-Sefa, Genebank Manager Dr. Tsvetelina Stoilova, Postharvest Specialist Mr. Ngoni Nenguwo, Training and Outreach Coordinator Mr. Hassan Mndiga and all Tanzanian staff at RCA. The farmers' groups invited to attend the Field Day were chosen from villages with good potential for vegetable production. Participants filled out a registration form, providing information on their interests, affiliation, production and consumption of vegetables in their family, as well as their personal contacts.

Registration information showed there is a lot of interest in Amaranth. It is the most popular crop grown and utilized by farmers who attended the field day. More than 50% of them have grown only Amaranth as their main vegetable crop. Amaranth was also the most frequently consumed leafy vegetable.



**Different amaranth lines planted in a demonstration plot at AVRDC-World Vegetable Centre, Tanzania**

The Field Day included tours of field trials and nurseries, as well as seed multiplication plots of various traditional African vegetables. During the field tour, the farmers were impressed by the wide range of characteristics displayed by different Amaranth varieties, such as plant height, leaf pigmentation, shape and size.

The field tour continued with visits of demonstration plots where visitors had a chance to see the recently released Amaranth varieties in Tanzania - "Madiira 1" and "Madiira 2". The plants were attractive and vigorous with plant height of more than 2 m and a lot of branches and flowers. It was easy to see the advantages of the new varieties compared with landraces which are usually grown in the country.

The last stop was at AVRDC's Postharvest Training and Services Centre, where farmers viewed packing equipment options and learnt about simple and effective low-cost methods to help protect their harvests. The field visit was followed by a general discussion, in which farmers took the opportunity to ask questions and learn about vegetable production, plant protection, and integrated pest management (IPM) including resistant varieties and best agricultural practices. Many farmers were curious about the nutritional value of vegetables and discussed recipes using vegetables that retain nutrients and taste. They were keen to learn more about the use of Amaranth grain, which is not so popular in Tanzania, and how they can prepare different products from Amaranth flour in ways that preserve its nutritional value.

At the end of the event, farmers received Seed Kits for vegetable crops including Amaranth, with leaflets describing the crop and advising how to grow and harvest the species.

*Author: Dr. Tsvetelina Stoilova (AVRDC World Vegetable Centre, Tanzania)*

## LEARNING THROUGH RESEARCH AT THE BECA-ILRI HUB



Rodrigues Ayagirwe (C) assisted by laboratory technician Isaac Macharia (L) while an interested colleague looks on

“As students conducting research on domestic cavies under the BecA-ILRI Hub project *Improving production, nutritional protein and household income through increased consumption of domestic cavies* (the *Cavies Project*), my colleagues Jeanne Wikondi, Youchahou Poutougnigni and I visited the Hub in Nairobi Kenya to acquire skills in molecular biology.

Everything about our one month stay at the BecA-ILRI Hub was very exciting, starting with the very warm welcome from staff members which made me feel right at home. The superb planning and the training we received meant that we could work in the lab within three days of our arrival.

We brought 109 blood samples from domestic cavies which I had collected from the mono-modal agro ecological zone in Cameroon and our main task was to assess the genetic diversity of the cavies in this area.

As well as having a laboratory technician assigned to assist us, we each received a comprehensive manual which enabled us to work independently, and all equipment and chemicals we needed were readily available.

At the end of every week, I attended a four hour presentation session where all visiting scientists and ABCF fellows made presentations on the progress of their work. These sessions not only allowed research fellows to talk about the challenges they faced, but were also an opportunity to give each other suggestions on how better to go about our research.

I am very grateful for the training we received at the BecA-ILRI Hub. Not only were we able to establish the genetic diversity of cavies in our study area, but we also feel confident to give advice to cavy farmers regarding rearing of this species. Most importantly, we have acquired the knowledge and tools necessary to apply molecular biology in our research.

In future, we will try to determine which genes are responsible for desirable traits e.g. coat colour, growth rate and prolificacy. We hope that our findings will contribute to the selection and breeding of cavies for increased productivity.”

*Author: Rodrigues Ayagirwe Basengere  
(Junior Lecturer, faculty of Agronomy and Environment, Evangelical University of Africa - DRC and  
MSc Student in Animal Breeding at the University of Dschang, Cameroon)*

## RAPID DIAGNOSIS OF AFRICAN SWINE FEVER BUILDS COOPERATION BETWEEN VETERINARY AUTHORITIES AND PIG TRADERS

African Swine Fever (ASF) Virus proved to be elusive in the border regions of Kenya and Uganda during the *ASF Epidemiology Project* Team's field work between July 2012 to June 2013. The project team tested 1100 randomly selected pigs, following 117 of them for 6 months, but found only one pig that tested positive for the virus. Yet reports of outbreaks during the same period were common. A farmers' first reaction after hearing of an outbreak is to sell his/her pigs, rather than to risk them dying of the disease. So when the project team arrived in a village where an ASF outbreak had occurred, obtaining samples for testing was difficult, as all the pigs were dead or sold.

It was also hard for the project team to gain the trust of butchers and other traders. They were very suspicious when asked about ASF, because they feared that a government quarantine would be imposed if the disease was detected. Quarantine means that pigs cannot be bought and sold, so the traders lose their livelihood. However, in most cases, government veterinary officers have not been able to impose a quarantine because they first need confirmation from lab tests that a rumoured outbreak is actually ASF. Getting timely test results is a real problem.

The project team was able to obtain samples from sick or recently dead pigs in three locations where outbreaks had been described to them by farmers. In these cases, the team had arrived very fast after hearing about the outbreaks and had taken blood samples for lab analysis using PCR tests. The team was able to run these tests within the study area at the Kenya Dept Veterinary Service's Busia Lab and provide results rapidly to District Veterinary Officers.

When he received a positive test result in March 2013, Dr Patrick Barasa, the District Veterinary Officer of Busia District, Uganda, was excited about the timeliness of the diagnosis. Because of the confirmation, he could talk confidently to the farmers about ASF and ensure a timely response.

Dr Barasa called a meeting of the traders in his District. A hundred traders attended, all of whom were anxious about the outbreak but were particularly worried and angry about the loss of revenue they would incur as a result of the expected quarantine measures – a halt to their trade in pork, which paid for their children's school fees. The meeting room was therefore tense and the traders viewed quarantine as a punishment by the Veterinary department.

Dr Barasa was however able to convince the traders that imposing quarantine quickly over a small area was in their interests because it would contain the disease, having less impact than the spread of the disease over a much bigger area. He was also able to convince the traders that a laboratory with effective diagnostic methods would be of value in ruling out ASF outbreaks, thereby saving the traders from the losses that would result from suspicion of an outbreak. The traders responded quickly and positively.

At the same meeting, the traders also decided to form a Traders' Association, which now has a Chair, Secretary and Treasurer, and is drawing up a Constitution. The Association is continuing to develop with Dr Barasa's advice, and is cooperating with the authorities in the control of ASF. Members have agreed that all members will pay 20,000 Uganda Shillings per year so that the organization can provide assistance to members whose livelihoods are affected by quarantines. Dr Barasa now receives much better information about trade of pigs in the District – he now knows that 60 pigs are slaughtered a day, whereas the previous government estimate was 30. He can also readily talk with traders about issues or convey information to the network easily by ringing the Chair of the Traders' Association – flow of information is much more effective.

Since the formation of the Traders' Association, traders have been helping to enforce quarantines In Busia



District, Uganda. They stopped two fellow traders who were transporting a pig on a motorbike in violation of the quarantine, and called the police. They also involved the police when they found a trader in a quarantined village selling pork and his weighing scales were impounded.

The posters produced by the project, providing biosecurity information to farmers to help stop the spread of ASF, have also been useful in educating the traders. For example, the traders say that because of the information in the poster, they now know that the disease can be spread by the sale of sick pigs or trade in infected meat – they previously didn't realise this.

Another ASF outbreak occurred in April this year. It was quickly diagnosed and controlled due to this collective effort of farmers, traders, laboratory and veterinary staff - this is an encouraging indicator of the success of the project.

*Authors: Barasa Patrick (Senior Veterinary Officer, Busia District Local Government Uganda), Jocelyn Davies (CSIRO)*

## ANALYSING SOCIAL SYSTEMS IN THE ASF PROJECT

Jacqueline Kasiiti and Mike Baronga of the African Swine Fever Epidemiology project participated in the Carnegie Mellon University annual summer school on Computational Analysis of Social and Organisational Systems over seven days in mid June, 2013.

Jacqui commented on the value of the training for her PhD research in which she is using social network analysis techniques to characterise pig trading networks and the advice and trust networks of farmers and other value chain actors in the project field study region on the Kenya-Uganda border. Jacqui appreciated the valuable hands-on experience of the course, using ORA software for network analysis; generating trader networks from the field study data; generating reports from project data that describe important network nodes, understanding more about key network nodes and paths for disease transmission and risk or vulnerability. She also found great value in learning about the importance of networks in organisational management, such as identifying influential personnel in an organisation.

*Author: Jocelyn Davies (CSIRO)*

## BECA HUB WORKSHOPS SINCE JUNE...

Workshop title	Collaborating institutions/organizations	Dates
Lab Management and Equipment Operations	Ethiopian Institute for Agricultural Research-Holleta	17 <sup>th</sup> -22 <sup>nd</sup> June 2013
Scientific write-shop: Project conceptualization and proposal development	ASARECA	8 <sup>th</sup> -12 <sup>th</sup> June 2013
Use of Illumina genome sequencing machine (MiSeq)	Alliance Global Group	24 <sup>th</sup> June to 5 <sup>th</sup> July 2013
Applied Conservation Genetics	University of the Free State (South Africa)	1 <sup>st</sup> – 6 <sup>th</sup> July 2013
Advanced Bioinformatics	J. Craig Venter Institute (JCVI) and National Institute of Allergy and Infectious Diseases (NIAID), USA	22 <sup>nd</sup> – 28 <sup>th</sup> August 2013
Agricultural Research Connections workshops 2013 (three workshops)	Bill and Melinda Gates Foundation	21 <sup>st</sup> July- 2 <sup>nd</sup> August 2013 30 <sup>th</sup> August 2013
Genotyping by Sequencing (GBS)	Cornell University ICRISAT	9 <sup>th</sup> -20 <sup>th</sup> September 2013
Scientific Research Paper Writing Workshop	Nelson Mandela African Institution of Science and Technology (Tanzania)	18 <sup>th</sup> – 22 <sup>nd</sup> November 2013

## ABCF: AFRICA BIOSCIENCES CHALLENGE FUND PLACEMENTS: JULY - OCT 2013

**Irene Onyango**

Ministry of Livestock Development- Department of  
Veterinary Services

Nationality: Kenya

*Project: Baseline study on honey bee viruses in Kenyan honey bee  
colonies*

**Peter Akoll**

Lecturer, Makerere University

Nationality: Uganda

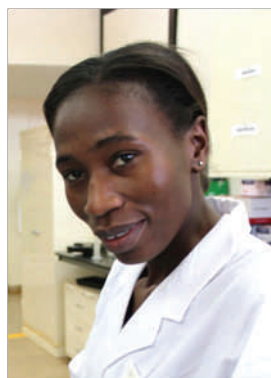
*Project: Investigation of bacterial diversity and contribution to  
the rapid identification of pathogenic bacteria in catfish hatcheries  
in Uganda*

**Calleb Olweny Ochia**

Scientist, Kenya Sugar Research Foundation

Nationality: Kenya

*Characterisation of sweet sorghum genotypes with high stem  
sugar that are stable across environments*

**Hilda Bachwenkizi**

Mikocheni Agricultural Research Institute

Nationality: Tanzania

*Development of lamp assay for detection of cassava brown streak  
disease causal viruses*

**Tesfamichael Abraha**

Hamelmalo Agricultural College

Nationality: Eritrea

*Diversity analysis of Eritrean sorghum landraces for drought  
tolerance using molecular markers*

**Naman Onyango**

Industrial Research and Development Institute

Nationality: Kenya

*Nutrient composition of selected Kenyan native edible mushroom  
species*


**Olivier Fokam**

University of Dschang

Nationality: Cameroon

*Technical molecular biology as an identification tool for bush meat in the urban markets of Cameroon: stakes, challenges and perspectives*

**Joseph Kiese Nsebua Matondo**

National Institute for Study and Agronomic Research

Nationality: DRC

*Genetic diversity assessment among common bean accessions for improving breeding program in DR-Congo*


**Juma Hussein**

University of Dar es Salaam

Nationality: Tanzania

*Bioprospecting of leaf litter and soil based saprophytic wild edible mushrooms from selected indigenous forests in Tanzania*

**Aganze Bigawa Bigman**

Institut supérieur pédagogique de Bukavu

Nationality: DRC

*MCH polymorphism in indigenous chicken populations in Bukavu, Eastern of DR Congo: populations' structure, diversity and distribution*


**Ibrahim Juma**

University of Dar es Salaam

Nationality: Tanzania

*Bio-prospecting of wood-based saprophytic edible mushrooms from selected indigenous forests in Tanzania*

**Berine Awuor**

Moi University, School of Public Health

Nationality: Kenya

*Nutrient composition of selected Kenyan native edible mushroom species*


**Samson Kilaza Mwaikono**

The Nelson Mandela African Institute of Science and Technology

Nationality: Tanzania

*Molecular diversity of bacteria from pigs around dumps and their importance to animal and human health*



**Ali Babiker**

Agricultural Research Corporation (ARC)

Nationality: Sudan

*Assessing the genetic diversity among cowpea to improve productivity using molecular markers*

**Gedeon Nsabiyumva**

Burundi Agronomic Sciences Institute (ISABU),

Nationality: Burundi

*Occurrence and distribution of aflatoxin and fumonisin in maize collected at post-harvest in Burundi*

**Vincent Ntezirayo**

University of Burundi

Nationality: Burundi

*Domestication trials of saprophytic wild edible mushrooms of Burundi: Taxonomy study and nutritional value*

**Elpidius Rukambile**

Tanzania Veterinary Laboratory Agency (TVLA)

Nationality: Tanzania

*Validation, adoption and adaptation of Loop-mediated isothermal amplification (LAMP) and Reverse line Blot (RLB) tests for diagnosis of important tick-borne diseases (TBD) and Molecular characterization of Theileria parva*

**Hamza Nassoro Msangi**

Scientist, Mikocheni Agricultural Research Institute

Nationality: Tanzania

*Genotyping of baobab using SSRs and gene based sequencing in Tanzania*

**Julius Mwanandota**

Tanzania Veterinary Laboratory Agency (TVLA)

Nationality: Tanzania

*Improvement of lumpy skin disease diagnostics*

**Siha Mdemu**

Tanzania Veterinary Laboratory Agency (TVLA)

Nationality: Tanzania

*Development and testing of a LAMP assay for Contagious Caprine Pleuropneumonia in Tanzania*



**Shamsa Salum**

Mikocheni Agricultural Research Institute

Nationality: Tanzania

*Screening and sequencing yam infecting viruses in Tanzania***Ramadhani Lipala**

Mikocheni Agricultural Research Institute

Nationality: Tanzania

*Screening and sequencing yam infecting viruses in Tanzania***James Barasa**

University of Eldoret

Nationality: Kenya

*Project: Molecular screening of bacterial microbe diversity in the African cat fish hatcheries in Kenya***Abubaker Muwonge**

National Crops Resources Research Institute, Namulonge

Nationality: Uganda

*Defense related genes expression in transgenic bananas plants expressing brap and pflp following inoculation with pathogenic Xanthomonas campestris musacearum*


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