

# Kirkhouse Times

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## Issue 16 – In memory of Sir Gordon Conway



*Sir Gordon Conway. © Imperial College London.*

This newsletter is dedicated to the memory of the late Prof. Sir Gordon Conway, who died in July 2023. Sir Gordon, Professor of International Development Imperial College London, served on KT's Board of Trustees (2013-2017). He brought his wealth of knowledge in sustainable agriculture to KT, advising the charity on seed systems and aiding in the establishment of the KT's Stress Tolerant Orphan Legume programme. KT remembers Sir Gordon with great warmth.

In this issue we look back at the last six months for KT. We share memories of a trip to South Africa, Botswana, and Madagascar KT had the opportunity to undertake in July. We thank our hosts for their time and hospitality.

We are also happy to announce that new members have joined KT's grantees. We warmly welcome Professor Tafadzwa Mabhaudhi, Professor Sean Mayes, Professor Festo Massawe and their team. This is the first KT-funded breeding project on Bambara groundnut. A warm welcome also to Professor Florence Akaneme (University of Nigeria) and her team. These teams are the pioneers of KT's newest plant breeding consortium: the African Bambara Breeding Initiative (ABBI). Read Professor Mayes' article below and you'll see why we are very excited about this crop!

We also welcome Dr Samuel Jeberson from the Agricultural University Rajasthan and Dr Vandana Tyagi from the Indian Council of Agricultural Research, National Bureau of Plant Genetic Resources and their teams as new members of KT's Stress Tolerant Orphan Legume consortium. KT has new members who joined after this newsletter went to press, and we will be introducing them in our next edition. Watch this space!

Two of KT's scientific consultants celebrated their first year with KT. We hope they will celebrate many more! We thank Travis Parker and María Muñoz-Amatriaín for their guidance and dedication.

Finally, try out the recipe for Bambara fritters – thank you Dr Laurencia Govender for sharing this with us!

Claudia Canales Holzeis  
KT Chief Executive

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## KT's trip to South Africa, Botswana and Madagascar



In August 2023, KT visited a selection of agricultural stations and universities engaged in legume breeding in South Africa, Botswana, and Madagascar. The trip was embarked on as a networking opportunity for KT in southern African countries, to meet breeders working on cowpea, common bean, and Bambara groundnut.

KT started the visit in South Africa where many African breeders, including some of the KT-supported PIs, have been trained. This was an opportunity for KT to meet members of the Agricultural Research Council (ARC) in Pretoria (ARC VIMP: Vegetable Industrial and Medical Plants) and Potchefstroom, the University of The Free State (UFS) and the University of KwaZulu-Natal (UKZN), the host institution of a recently established KT-funded project on Bambara groundnut.

During the second leg of the journey KT visited Botswana, one of the centers of origin of cowpea. In Botswana, KT had the opportunity to visit the Botswana University of Agriculture and National Resources (BUAN) and the National Agricultural Research & Development Institute (NARDI).

Lastly, KT visited two National Center for Applied Research on Rural Development (FOFIFA) centers (Antananarivo, and Antsirabe) in Madagascar. Common bean is the most important legume in Madagascar, and the crop is also exported.

Overall, the KT Exploratory Trip to South Africa, Botswana, and Madagascar was a successful trip as it showed KT the potential benefits of having pilot projects in these countries. Since returning from this trip, two pilot projects started: the first is on Bambara groundnut led by Professor Tafadzwa Mabhaudhi from UKZN in South Africa, the second is a project led by Dr Sethunya from BUAN in Botswana with a focus on aphid resistance in cowpea.

Mark-Sharbel Asman, STOL/ABBI Administrator





## Bambara groundnut – a tough nut to crack!

Bambara groundnut (*Vigna subterranea* (L) Verdc.) is morphologically very similar to peanut (*Arachis hypogaea* L) and is widely grown at low levels in many countries in sub-Saharan Africa. It can tolerate poor free-draining soils and fix atmospheric nitrogen with a wide range of rhizobial species. This allows it to produce a pulse seed with between 18 – 24% protein and a small amount of lipid (around 6%).

Bambara groundnut is largely grown for food (and nutrition) security, with plants producing some yield when other crop species do not. In particular, its ability to survive drought is one of the most valued traits, and different lines can have one or more of the three main drought resistance mechanisms – escape, avoidance and tolerance.

As the world warms and rain patterns shift, many areas are seeing reductions in rainfall and more frequent intermittent drought episodes during a crop's lifecycle. Indigenous underutilised crops have a great deal to offer, both locally and potentially globally, to support human and animal diets.

Research into this crop at the University of Nottingham began with a packet of seeds received by Sayed Azam-Ali in the late 1980s for assessment in the tropical glasshouse research unit that Prof John Monteith had established. This led to a number of ODA and EU projects evaluating the crop with Partners in Africa (BamGrow and BamFood) and Africa and India (BamLink). In 2013, the Crops for the Future Research Centre was established in Malaysia as the first research centre dedicated to underutilised crops. Bambara groundnut (BamYield) was adopted as an exemplar crop. An FAO project supported collaborative work in Africa (including IITA, which has the largest Genebank for this species) and Indonesia. More recently, partially supported by the University of Nottingham Future Food Beacon (BamBreed), field assessment at the University KwaZulu-Natal (South Africa) and Crops Research Institute (Ghana) is moving towards varietal registration (hopefully in 2024).

With an estimated 7000 plant species having been used by humans, we are chronically dependent on only three cereals (rice, wheat and maize) and one legume (soybean), which have largely been adapted to high-input monoculture agriculture. Climate change and sustainability mean that we need more resilient and nutrient-dense crops adapted to harsher environments and requiring fewer inputs. Bambara groundnut is a good case study of the opportunities (and difficulties) associated with bringing these 'new' crops into future agriculture.

Prof Sean Mayes, Prof Festo Massawe, Prof Tafadzwa Mabhaudhi



## First Year as a KT Consultant

### “One team”

In the last year, it has truly been an honor to work more closely with the outstanding community supported by the Kirkhouse Trust. The work being done by these teams transcends spatial scales – from the molecular to expansive field trials – as well as broad areas of study, from genetic mapping to microbiology, statistics, bioinformatics, and of course marker assisted selection. It is an exciting time to be involved with the Kirkhouse Trust, including the African Bean Consortium specifically. Due to the hard work of the PIs, students, technicians, and project management staff, new varieties are now being released by several programs simultaneously across the continent, with impressive progress being achieved by all the teams involved.

My vision for the African Bean Consortium, and perhaps the Kirkhouse Trust teams broadly, is to continue strengthening our networks in a “one team” approach. In this model, I am excited about the sharing of technical knowledge, skills, experience, and – where possible – germplasm and facilities between all of Kirkhouse Trust’s many talented players. Examples of these activities include cross training between programs, in which visits could occur between funded projects to share knowledge, skills, and experience. In the same way that training visits already occur at UC Davis, these could also be expanded to include cross-training between African programs. Further, the development of breeding materials with improved disease resistances and other beneficial traits may serve as an opportunity for the programs to share germplasm and varieties, in collaborative trials and/or as parents in breeding, thus building on previous successes. At UC Davis, we have an important role to play in ensuring that the African teams have the genomic resources and technical skills to pursue their projects as efficiently as possible. We will continue to build on these resources and explore novel strategies to enhance the accuracy, flexibility, and throughput of marker screening.

The Kirkhouse Trust programs are guided by a single fundamental goal: to deliver improved crop varieties to African small-holder farming communities. Marker-assisted selection will be a critical tool to achieve this goal. By strengthening the pooling of skills, experience, and resources across the entire Kirkhouse Trust community, I am excited about where we are headed in years to come.

Dr Travis Parker, KT Consultant



*Dr Travis Parker is the KT Consultant for ABC*

### The beginning of a journey of impact and collaboration

Being part of the team of consultants for KT’s African Cowpea Program (ACP) has been one of the greatest honors of both my career and personal life. This is because of the direct impact that I feel my work can have on African agriculture and the lives of so many. And that really motivates me. As I reflect on my first year as a KT consultant, it has been a journey filled with learning, thinking, and positive interactions with the great individuals that make up this organization.

This first year in KT started with me getting to know how KT operates, the roles of every person in the organization, and the funded teams and projects. Also, I was involved in evaluating many project proposals aimed to identify new Principal Investigators in African institutions.



*Dr María Muñoz-Amatriáin is the KT Consultant for ACP*

It took some time to fully understand every ongoing project and the direction of the organization. I am very grateful to Claudia, Cynthia, and Fleur from the KT side, along with the other two consultants in the program Mike and Robert, who guided me throughout this process. And I would like to extend my gratitude to Helen, Philip, Mark, and Emma for all their help and kindness during this first year. Really every person in KT is a great professional and human being, and it is truly a privilege to get to interact with all of them.

Early this year was our Annual Meeting in Livingstone, Zambia. What a great experience (casseroles apart) being part of it! This was an important meeting for me because it allowed me to have in-person interactions with KT-funded teams, as well as with most people working in KT or collaborating with the organization, with who I shared good discussions, experiences, and laughs. It was also a pleasure to interact with Travis, the lead consultant for the African Bean Consortium (ABC). Having a single annual meeting for both the ACP and ABC programs -a novelty of this year- was very positive. This approach allowed researchers working on one crop to share knowledge and experiences with those working on the other crop, unifying everyone into one team, and promoting team work.

We are at a critical moment in time, with food and nutritional insecurity intensifying in many regions of Africa due to climate change. And agriculture is at the center of these challenges. For many reasons including its operational approach, size, and adaptability, I believe that The Kirkhouse Trust is uniquely positioned to make a significant positive impact in adapting key legume crops to climate change threats. And I am excited about what we can all accomplish in the near future.

I can't conclude without mentioning the most exciting moment in KT so far: meeting Ed and his wife Sonia during the SPAG meeting last September. Their dedication to improving people's lives through technological advances and training is truly inspiring.



*Dr María Muñoz-Amatriaín and Sir Edwin Southern*

Dr María Muñoz-Amatriaín , KT Consultant

## **Welcome to Dr Samuel Jeberson at the Agricultural University Rajasthan**

*Samuel is the Principal Investigator for STOL RAU*



*Dr M Samuel  
Jeberson, Principal  
Scientist, STOL*

**Why did you choose your current work?** I was born into a farming family. I used to see my father every day going to the field with his spade. I was very interested in accompanying my father. In my childhood, I used to collect field peas from shops and raise them in my kitchen garden. And then my interest grew in the field of agriculture. After my school days, I joined B.Sc. (Ag) at Tamilnadu Agricultural University, Coimbatore, Tamilnadu, India. Then I have chosen genetics and plant breeding in my Masters and doctoral studies at CSK Himachal Pradesh Agricultural University, Palampur, Himachal Pradesh, India. I am directly connected with farmers and intend to uplift the resources of poor farmers. So I have chosen this current work.



### Describe what you do on a typical day

I used to get up in the morning at 5 o'clock and do the prayer for 5–10 minutes. I used to cook for my kids and prepare them for school. After that, I go for a 45-minute walk. I used to go to the field at 8 a.m. to observe the experimental fields and return to the office at 10 a.m. Then distribute the assignments to my field assistants and look after the administrative work. The office closes at 5 p.m., but I reach home at 5.30 to 6 p.m. due to the completion of some assignments at the office. Prepare the dinner for the kids and myself, have dinner at 8 p.m., and go to bed around 10 p.m. after the regular family prayer.

Dr M Samuel Jeberson, STOL RAU, India

## Welcome to Dr Vandana Tyagi at the ICAR-National Bureau of Plant Genetic Resources (NBPGR)

*Vandana is the Principal Investigator for STOL NBPGR*



*Dr Vandana Tyagi is the Principal Scientist, Germplasm Exchange and Policy Unit, STOL NBPGR*

### STOL in India

The collaborative program entitled: "*Evaluation of Stress Tolerant Orphan Legumes (STOL) for use in dryland farming systems across sub-Saharan Africa and India - Promoting India-Africa Framework for Strategic Cooperation*" in partnership with the Kirkhouse Trust (KT) since May 2018. Major activity of STOL NBPGR includes; sharing improved varieties of orphan legumes, with the aim to improve the food and nutritious status of vulnerable populations.

Pulse crops in general are considered to be not only drought hardy but also possess ample amount of nutrients thereby providing a better option for providing food and nutritional security. However, some of these minor pulse crops have remained relatively neglected by both researchers and industry because of their limited economic importance in the global market. KT has supported several pulse breeding projects across India and sub-Saharan Africa, and this program facilitates the introduction and exchange of stress-tolerant orphan legumes into African regions to address the issue of climate change and nutritional security. The ICAR-National Bureau of Plant Genetic Resources is the nodal agency for the implementation of the project activities in India and therefore, I wanted to be associated with the project from the beginning. On superannuation of Dr Pratibha Brahmi, I took over the responsibilities of Principal Investigator from August 2023.

### Describe what you do on a typical day

"On a typical day respond to email and messages with regard to sharing of germplasm and also providing inputs / comments on various issues for access of plant genetic resources (PGR). Being a PGR faculty take classes on germplasm exchange issues. Prepare reports and compile data on exchange information relating to plant genetic resources and planning for organizing workshop, symposia, and training programs on various aspects of PGR management."

Dr Vandana Tyagi, NBPGR STOL India

# Welcome to Prof Tafadzwa Mabhaudhi, Prof Sean Mayes and Prof Festo Massawe at the University of KwaZulu-Natal (UKZN) and University of Nottingham

*Tafadzwa is the Principal Investigator for ABBI, UKZN*



*Prof Tafadzwa  
Mabhaudhi  
Principle Investigator,  
University of KwaZulu-  
Natal ABBI, UKZN*

## **Why did you choose your current work?**

While I grew up in the city, my parents never forgot their culinary roots. We always enjoyed a lot of traditional foods in the house, and my dad would cook them and tell us about the history of some of the foods. As I grew up and started my career as I researcher, I was given the option to work on potato research or join a Water Research Commission project on water use of traditional and indigenous crops. I chose the latter, arguing that I wanted to do what only a few others were doing and also because I have a fondness to these crops. I'd say, from then on, the rest is history.

## **Describe what you do on a typical day**

I'm now more into research for development. A typical day starts with setting the ambition – reminding myself that there are bigger existential challenges that we are trying to solve. What follows is thinking and analysis of how the work we are doing across several themes such as breeding, ecophysiology and modelling, diets and nutrition, climate change adaptation – how can we integrate all of this to deliver on the challenge for a healthy people and planet. Who do I need to work with to enhance and amplify the work we are doing, and how can we improve our science and delivery? This is often when I am having my muesli before I start my day.

Prof Tafadzwa Mabhaudhi, ABBI UKZN



*Prof Sean Mayes  
Co-PI for the grant,  
Global Programme Director,  
Accelerated Crop  
Improvement, ICRISAT*

## **Why did you choose your current work?**

I'm not from an agricultural background, having grown up in UK just south of Cambridge where my dad was a metal miller. I was interested in Chemistry, although I did my first degree in Natural Sciences and a final year in Genetics. Having been a PI in Cambridge and University of Nottingham, I was introduced to bambara groundnut through a PhD student of Prof Azam-Ali's as I had extensive experience of using molecular markers in crops. However, academic life in UK is focused on major crops or model species, without really trying to make a difference to people's lives, in practice. Agriculture is a bit of an afterthought in UK, so I worked initially at Crops for the Future Research Centre in Malaysia and have now moved to ICRISAT to try to help scientific progress be translated through into providing small farmers with better lives.

## **Describe what you do on a typical day**

At the moment, we're reorganising my program (Accelerated Crop Improvement) to have a far stronger focus on pre-breeding and accessing genetic diversity for improved breeding traits, particularly in millets and dryland legumes. This inevitably involves a lot of meetings and workshops, but sometimes I do get to visit the field sites (both in HQ, in other Indian states and in Africa) and can see that relatively simple changes and new seed can make a difference to villagers and their lives.

Prof Sean Mayes Co-PI, ABBI



*Prof Festo Massawe  
Co-PI for the grant,  
University of Nottingham  
Malaysia (UNMC), Malaysia*

**Why did you choose your current work?**

*Born and raised in a farming community, in the foothills of the highest mountain in Africa – Kilimanjaro, my research is born out of personal knowledge and experience, about farming and food systems, gained through first-hand involvement in everyday farming activities. We grew a variety of crops in mixed cropping systems and we ate all sorts of foods from a variety of plants and animals to insects. Agrobiodiversity underpinned not only our food and nutritional security but also our livelihoods and our culture.*

**Describe what you do on a typical day.**

*In academia, a typical day would comprise of early morning visit to green/rain-out shelters, field or laboratory experiments/trials, teaching and other classroom activities, meetings and pastoral care (students and researchers), emails and then emails, and more meetings followed by journal article review ... the list goes on!*

Prof Festo Massawe Co-PI, ABBI

## **Welcome to Prof Florence Akaneme at the University of Nigeria**

*Florence is the Principal Investigator for ABBI, UNN*



*Prof Florence Akaneme, Principal  
Investigator at the University of  
Nigeria, ABBI, UNN*

**Why did you choose your current work?**

My interest in Genetics and Plant breeding was ignited by one of my lecturers, Late Prof. EneObong Effiom EneObong. This was during my undergraduate school days. His lectures were so interesting that I made up my mind then to specialize in that field. His interests in the improvement of Orphan crops also influenced my choice of research crops. So far, my students and I have been carrying out investigations on *Sphenostylis stenocarpa* (African Yam Bean), *Macrotyloma geocarpa* (Kerstings groundnuts) among others.

**Describe what you do on a typical day**

The wake-up time for my family is 5am. After our morning prayers, I freshen up for the day. Subsequently, I drop my son off at his school at 7.15am. On getting back to the house, I open my laptop to respond to emails in my inbox (if any). Once I am done with that, I leave for the office for lectures, meetings, discussions with my undergraduate and post graduate students on their research work (both laboratory and Field). I go back to my house once I have concluded the day's activities.

Prof Florence Akaneme PI, ABBI UNN





*Prof Ngozi Eucharia Abu,  
Co-PI at the University of  
Nigeria, ABBI, UNN*

#### **Why did you choose your current work?**

My siblings and I were brought up in farmers' field and watching our mama do her plant selection in the field and after harvest was quite fascinating. I grew to love plants and plant manipulation. So I entered higher institution in line with that passion and as my understanding increased I chose the field of genetics and plant breeding. Moreover I love teaching and was always teaching my peers. My current career is just suitable for what I desired to do, which is principally teaching and research.

#### **Describe what you do on a typical day**

When I wake up at about 4:30 am I appreciate God for life and the brand new day. Still on my bed I listen to a motivational message for about 10 to 15 minutes. I then get out of bed, stretch myself in diverse ways; just a little exercise of about 5 minutes, then drink water and enter the kitchen for domestic affairs. We say our family morning prayer thereafter and by 7 am I will put the children in the school bus. I will then prepare and leave for office.

Prof Ngozi Eucharia Abu, Co-PI, ABBI UNN



*Dr Chiemeka Nwakaego  
Onaebi, Co-PI at the  
University of Nigeria, ABBI,  
UNN*

#### **Why did you choose your current work?**

I was born in a family that practiced subsistence farming. Growing up, I observed that the crops were always infected with diseases which as a result led to low yield. Though, as a little girl, I couldn't fathom the causes of the infections and how to control the diseases. This spurred my passion to study Plant Pathology to enable me know the etiology of plant diseases and also how to control them in order to improve crop yield and to ensure food security in my country.

#### **Describe what you do on a typical day**

My typical day starts with prayers. I go to work and teach the courses allocated to me. I carry out research in Plant Pathology Laboratory after which I attend to my course advisees and other students. I read journal articles to improve my knowledge on new research findings.

Dr Chiemeka Nwakaego Onaebi, Co-PI, ABBI UNN



*Mrs Jane Chinekwa,  
Research Associate/ Lab  
Technologist at the  
University of Nigeria, ABBI*

#### **Why did you choose your current work?**

Plants are one of the gifts of nature to mankind. Research has proven that numerous benefits can be derived from so many wonder plants. These benefits sometimes are not maximized as a result of disease infestation on plants. This lead to my desire for research on plant pathogens and appropriate control or treatments.

#### **Describe what you do on a typical day?**

I wake up at 5am on a typical work day, pray with my family and carry out domestic duties as a wife, then take my children to school at 7:30am. As a technologist I focus on reading current research articles for new ideas and techniques that will help me improve in my area and also attend to student issues.



*Prof C.C. Onyeke, Research Associate and Head of Dep. at the University of Nigeria, ABBI, UNN*

### **Why did you choose your current work?**

As a plant pathologist, I chose the current work because of my interest in fighting hunger, starvation and poverty through research efforts that mitigate crop plant diseases. Poverty and hunger could be alleviated by increased crop yield as farmers will have good returns on their investments and consumers will have food at affordable prices. The current work focuses on improving the crop's resistance to diseases which expectedly will lead to increased yields.

### **Describe what you do on a typical day.**

I go to work regularly and on time too. My work comprises teaching, research and administrative duties. My typical day is usually busy and herculean.



*Mr Chima Maduakor, Research Associate, at the University of Nigeria, ABBI, UNN*

### **Why did you choose your current work?**

I am a research assistant in the Pathology unit of Plant Science and Biotechnology University of Nigeria, Nsukka. I choose this current work because of my enthusiasm and passion for plant breeding and mycological investigations - thus my MSc. Thesis was written up from investigations I carried out on fungal species.

### **Describe what you do on a typical day**

I try to get into school at least an hour before the students come in. During this time, I check all my emails and look over my to-do list. At around 8 a.m., students start filing in. I try to be present for any students who may have some questions about their assignments or tests. I spend

the rest of the morning attending to students and private study.

After a brief lunch break, I spend the rest of the time grading assignments and practical files. Once the students leave for the day, I begin planning for the next day. I am also available to offer students any additional help after school and help them meet their goals.



*Mr Wisdom Akubue, Project Technicain , at the University of Nigeria, ABBI, UNN*

### **Why did you choose your current work?**

I have passion for technology and as the Departmental ICT contact person; I am in-charge of updating the Departmental Web page in the University's website. I handle other technical matters in the Department. I also work in the Departmental Library where I assist staff and students in making use of the Library's resources.

### **Describe what you do on a typical day**

On a typical work day, when I wake up, I say my prayers; get ready the things I will need for my work/at work. I handle ICT related matters for the Department. Additionally, I work in the Departmental Library, assisting staff and students to make use of the Library resources.

**Bambara Fritters** - Recipe and accompanying photos provided by Dr Laurencia Govender, Centre for Transformative Agricultural and Food Systems.

**Ingredients:**

- 600 g Bambara groundnut beans (Soaked for 24 hours)
- 2 eggs
- 1 celery stalk cut into chunks
- 5 red chillies (dried)
- 3 stalks Spring onions finely chopped
- 1 medium onion
- 4 tablespoons flour
- 2 teaspoons salt
- 2 teaspoons white pepper
- 2 teaspoons Cajun spice
- Handful of coriander
- Vegetable oil

**Method:**

- In a blender add all dry ingredients except the flour. Blend until smaller than chunks but not very fine.
- Add flour and mix well ensuring that there are no lumps.
- Heat oil in a frying pan. Ensure that there is enough oil to fry the patties.
- Using a tablespoon to scoop up the mixture, roll and flatten.
- Fry in the oil on medium heat and ensure that you turn them every 1-2 minutes to ensure that they cook evenly. It should be a golden-brown colour.
- Leave enough space in the frying pan for the Bambara fritters to cook. Do not overcrowd the frying pan.
- Best served hot or warm and served with your favorite dipping sauce.

**Nutritional Value per serving (1 patty):**

- Energy: 146 calories
- Total Carbohydrates: 21.1g
- Total protein: 6.9g
- Total fat: 3.8g
- Fiber: 2.2g



We hope you enjoyed reading this newsletter.  
Mark-Sharbel Asman.