

Research Application Summary

Perspective on strengthening collaborative research and human capital development in Africa

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Abstract

This is an invited paper presented at the Fifth African Higher Education Week and RUFORUM Biennial Conference held 17-21 October 2016 in Cape Town, South Africa during a special session organised by CGIAR-SROs-NARIs and Universities to forge alliances to strengthen collaborative research and human capital development for African agriculture. It shares the author's perspective on collaborate degree training and research undertaken by the author as a graduate student, during postdoctoral placement with ICRISAT and as a scientist working for an African National Agricultural Research Institution.

Key words: Africa, collaborative research, human capital development, RUFORUM

Résumé

Ceci est un article présenté par invitation durant la Cinquième Semaine de l'Education Supérieure en Afrique et la Conférence Biennale de RUFORUM tenue du 17-21 Octobre 2016 à Cape Town, Afrique du Sud au cours d'une session spéciale organisée par Le Groupe consultatif pour la recherche agricole internationale (GCRAI) les organisations sous les régionales (OSRs), les Instituts Nationaux de la Recherche Agricole (INRAs) et les Universités pour forger des alliances afin de renforcer la recherche collaborative et le développement du capital humain pour l'agriculture africaine. Il partage la perspective des auteurs sur la formation collégiale et les recherches menées par l'autrice en tant qu'étudiante doctorante, en stage postdoctoral à l'ICRISAT et en tant que scientifique travaillant pour une institution nationale africaine de recherche agricole.

Mots clés: L'Afrique, la recherche collaborative, le développement du capital humain, RUFORUM

I was awarded a Field Attachment Program Award (FAPA) through the Regional Universities Forum for Capacity Building in Agriculture (RUFORUM) – CGIAR Research Program on Dry land Cereals based with an International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) Scientist in Kenya at ILRI. The award was for a postdoc fellowship following completion of my PhD degree training in Plant Breeding and Biotechnology at Makerere University in July 2016. I was very honoured to have this opportunity to engage with staff at RUFORUM and ICRISAT and participate in their activities. This latest honour fortifies my pride and heighten myself esteem since my MSc

and PhD degrees were from a top quality education entity at Makerere University. In fact, I am so grateful to Makerere University, Regional Universities Forum for Capacity Building in Agriculture (RUFORUM) and International Crop Research Institute for the Semi-Arid Tropics (ICRISAT) for offering me my life dream opportunity.

ICRISAT is helping to improve the livelihood of millions of farmers in dryland areas across the world where more than two billion people live. These people face hunger and poverty, malnutrition and environmental degradation, in addition to other misfortunes and various maladies. The sorghum crop, among others, is a mandate crop for ICRISAT and is a dietary mainstay for over a one half billion people who habitually rely on it as an important source of food, income and feed. I am personally very much impressed by the discipline and commitment of scientists at ICRISAT. They exert leadership in their fields of research, are very goal-oriented and though quick results are not always at hand they never lose hope and enthusiasm. Working in such a positive environment helped to make me a mature researcher and hopefully a better scientist. Additionally, I felt it was important for me to be working in such environment that is a very practice-oriented especially in a multi-cultural setting provided by ICRISAT and other CGIAR institutions. Working at ICRISAT Centre in Nairobi, Kenya enabled me to establish direct contact and discussion with breeders working in various crops, and through ICRISAT and RUFORUM, opportunities to participate in international conferences and training courses, which have helped me accumulate experiences, widen my vision, enrich my ideas and in general grow up.

At ICRISAT my research focused on control of leaf blight of sorghum (caused by *Exserohilum turcicum*) mainly through identifying the resistance genes in sorghum using comparative genomics. This foliar disease seriously affects sorghum and maize growth, production and productivity in East and Central Africa. This was a continuation of one of my main experimental recommendations/ future prospective coming from my PhD research work and thesis at Makerere University (see Mayada, 2016 for details). I did extensive comparative studies on genetics of sorghum and maize and I discovered more genes playing a role in maize leaf blight resistance than in sorghum. I selected one of the maize genes named remorin gene which exhibits significant contribution towards leaf blight resistance. I retrieved this gene from the maize database and I used its sequence to search against sorghum database. Then I developed molecular markers and I used them to screen my recombinant inbred lines (RILs) that I developed during my PHD study. I associated these markers to the leaf blight resistance for association mapping in my RILs. The results from my research will provide opportunity for more comparative studies between maize and sorghum in tackling the devastating effect of leaf blight in the two globally important cereals.

As a daughter of a research scientist and a granddaughter of a farmer from Gezira Scheme in Sudan I really wanted to follow their steps and complete my higher education in Agriculture. I decided to approach the subject more scientifically and studied Plant Breeding and Genetics at Makerere University with little knowledge of Uganda and the English language at the start, but with a very clear goal. I also worked hard for winning

this opportunity to come to ICRISAT because I really wanted to learn more, to work in a laboratory with better conditions and interact with such highly experienced scientists. I was intently looking for an opportunity that would enable me to strengthen my research capacity to support my home institute Agricultural Research Corporation (ARC) in Sudan. My Field Attachment Program (FAPA) at ICRISAT arranged by RUFORUM offered exactly what I had been looking for: practice-oriented research specifically aimed at contributing to the fight against poverty and promoting sustainable development.

At ICRISAT, molecular biologists focused on improving the sorghum plant, an agricultural crop that is very important for Sudanese but has not been the subject of much genetic research. After finalizing my FAPA at ICRISAT, I shall return to ARC and apply everything I have learnt about the molecular genetics in sorghum to other crops that are important in Sudan and Africa. My main concern is really not increasing my list of publications but rather making a difference for better food crop availability and sufficiency for my country, both for the Sudanese and other people. Certainly I still love to publish, to share my research results with the international community. I want to lead my own group of technicians and skilled workers at ARC offices and research farm land and produce results. I want to work with other researchers to breed more resilient crops so as to make hunger in Sudan, adjacent countries and the rest of Africa a thing of the past. This is not impossible. The main hurdle is commitment to making a difference, collaboration, and yes funding which hopefully will become more available from national governments, regional and international organizations.

Acknowledgement

My special thanks to RUFORUM for supporting my MSc and PhD training and for the post-doc attachment to ICRISAT. This paper is a contribution to the Fifth African Higher Education Week and RUFORUM Biennial Conference

Reference

Mayada, M. B. M. 2016. Genetic analysis of dual resistance to anthracnose and turcicum leaf blight in sorghum. PhD Thesis, Makerere University. Kampala, Uganda.