

Biosciences for Farming in Africa (B4FA)- 2011-2014 Report Summary

Currently 1 billion people are unable to access sufficient food, and a further 2 billion people suffer from deficiencies in essential micronutrients which renders them unable to lead a healthy and productive life. Africa remains the only continent where poverty and hunger continue to increase and where agricultural productivity over the past 50 years shows little improvement, lagging behind even other developing economies. World population is forecast to grow from 7 to possibly 10 billion by 2050, creating huge additional pressures to meet global food demands.

Simply by adopting existing and available improved planting material and agronomic practices, agricultural production in Africa could double or treble. Furthermore, advances in genomics, marker-assisted screening, phenotype analysis, and computer modelling have greatly accelerated the breeding process. Given this context and the potential for enormous beneficial impact from the new genetic technologies through conventional and biotechnological plant breeding, Biosciences for Farming in Africa (B4FA) was designed to address challenges to the implementation of these impressive scientific advances where they are most needed, so that smallholder farmers can benefit from the advances in genetics as they relate to plant breeding. The overall aim was to produce a reproducible model for dialogue and communication in four targeted African nations – Ghana, Nigeria, Tanzania and Uganda. B4FA comprised three different activities:



Activity 1 – Overall Benefit and Promise of Genetics

Publications: production and dissemination of two scholarly publications, *Insights* and *Viewpoints*, which synthesized information and views from global opinion leaders about the potential benefits, concerns, applications and consequences of new genetic technologies for farming in Africa. These were not intended to advocate a position but to offer from personal experience an authoritative and independent brief. Authors who contributed to the publications include Calestous Juma; Joe de Vries; Dannie Romney; Segenet Kelemu; Jennifer Thompson; Margaret Karembu; Marco Ferroni; David Baulcombe; and Diran Makinde. The

publications were distributed to key contacts in target countries as a hard copy, to the Ourplanet.com mailing list of 12000 people, and are also available for download and as an audio file in the B4FA website (www.b4fa.org).

B4FA website: b4fa.org was developed to explain the science that underpins plant genetics and plant breeding (conventional and biotechnological) to serve as a central resource with a clear focus on African crops. The newsletter, the *B4FA Week in Review* newsletter aims to showcase the B4FA Media Fellows' work and to share relevant news and features in plant breeding with a strong African focus. The newsletter is sent weekly to over 1,000 recipients. B4FA also has an active Twitter account (B4FA @B4FA) with about 800 followers.

Activity 2 – Effective Communication of Genetics

The starting premise is that if the media in the target countries was better informed about the potential of conventional and new genetics technologies for improving agricultural productivity it would raise the debate in each country and inform the wider population. As a result, the understanding of the role of new genetics of plant breeding in Africa to improve food security, rural economic development and environmental sustainability would be better understood, in particular through a base of informed young and professional people, from the media, regulators, farmers and extension officers.

An initial analysis of the media establishment and scoping studies in the target countries showed that the technical knowledge and understanding of science by journalists and editors in Africa was then low, as a result of streaming in the education system and a lack of focus on science reporting as a skill in Africa. Visits to national research institutions also showed that there is a wealth of local research activity in African countries, however there is lack of funding in local research programmes for communication of their activities, and consequently scientists rarely discuss their work with journalists.

Therefore for maximum and sustained impact, we decided to develop the media programme following two principles: 1) the workshops needed to include some of the fundamental aspects of the science, as well as a basic introduction to science journalism as a distinct discipline; 2) the lack of long term engagements between researchers and the media, combined with the lower level of technical knowledge among many of the journalists, suggested that significantly improved outcomes could be achieved by engaging over the long term.

B4FA ran two long-term, overlapping professional development Media Fellowships and a round of master classes for the best Fellows on the new genetics of plant breeding. Journalists and editors from print, radio and television were enrolled by competitive application in a programme that offered technical training combined with field-visits, mentoring and support. The Fellowship also provided opportunities for long-term networking amongst the Fellows, and between them and the research community of their country. Content and engagement methods were varied as much as possible between sessions, and practical journalism exercises were interleaved with formal presentations, practical experiments (including a DNA extraction from fruits) and learning games. National researchers were enlisted to participate to explain their research and its national significance, and to interact with the fellows during the four days on the initial training workshop.

Fellows were also offered continuous mentoring and support for writing and broadcasting on new genetic technologies, and regular opportunities for visits to local research institutes; occasional opportunities for international travel to research institutes or conferences; and, to consolidate their learning, with one-day refresher training before the next round of fellowship training workshops. Fellows were also encouraged to join a Facebook discussion group for their country, and to send B4FA project staff copies or references to any piece they wrote or broadcast that was relevant to new genetic technologies for farming in Africa for inclusion in the B4FA “*Week in Review*” newsletter.

During the 21 months of the programme (September 2012 to May 2014) 160 journalists (including over 20 editors, subeditors or bureau chiefs) were enrolled in the media programme. B4FA Fellows attended, by competitive application, field trips to 50 research institutions and commercial and experimental facilities in their own countries, and to nine international conferences in the UK, the USA (World Food Prize conference); Kenya; Ghana (the FARA African Agricultural Science Week); and Ethiopia. As a result, more than 1,000 journalistic pieces were reported to us, and a considerable number of them continue to contribute to the B4FA “*Week in Review*”, a year after the end of the Fellowship.

Many Media Fellows report that, as a result of their interest and efforts, their publications take agricultural science stories more seriously now, and are willing to devote more space to their coverage. Several Fellows have established agricultural science “beats” for themselves, and have become the go-to people in their media organisations for stories on biotechnology and modern farming.



Activity 3 – Strengthening and Enabling Implementation

An effective agricultural extension system promotes the adequate and timely access by farmers to relevant information on improved technologies that are suitable for the agro-ecological and socio-economic characteristics of the area. However, government extension services in Sub-Saharan Africa are typically underfunded, understaffed, suffer from poor planning, weak accountability and governance issues. Therefore the third set of B4FA activities comprised three scoping studies of how to strengthen extension services, or their alternatives, targeting smallholder farmers.

The first study was carried out by the National Institute of Agricultural Botany (NIAB), who has a long history in supporting the development of improved crop varieties and transferring advances in plant science knowledge into practical agriculture in the UK. NIAB Innovation Farm (<https://www.innovationfarm.co.uk/>) is a unique knowledge transfer and exchange hub linking scientific research and agricultural practice through themed exhibitions, and is directly linking to farmers. The study sought to find out whether the NIAB Innovation Farm concept could be applied in Kenya, Uganda and Ghana to help improve the awareness and adoption by smallholder farmers of improved varieties, and establish links with potential partners.

The second study, in partnership with the University of Reading, UK, and Makerere University, Uganda, explored how male and female farmers access information about crop genetic improvements, how they use that information and the constraints they face. The research was conducted in Iganga and Nakaseke Districts in Uganda using a mix of qualitative (focus group discussions, key informant interviews), participatory (timelines, innovation histories, participatory budgets, communication maps) and quantitative (questionnaire survey) methods.

The third project under this initiative aimed to assess the potential of an interactive learning application (ELIMSIS), operational offline and on mobile devices, for delivering targeted agricultural information in a timely fashion to resource-poor smallholder farmers at scale. The project was carried out in Northern Tanzania in partnership with the NGO Farm Africa, and consisted of three main components: 1) development of a modular course in Swahili on sesame production; 2) development of the back-end application to adapt the learning tool to a mobile application suited to deliver agronomic information offline and on smart tablets to farmers; 3) a project evaluation, addressing efficacy of the platform, and also issues pertaining to sustainability and scalability. A scale-up initiative is about to commence in Tanzania. In addition, NIAB and ELIMSIS have recently started a new collaboration the Kenyan Agricultural and Livestock Research Organisation (KALRO) to deliver information on wheat variety trials, carried out in farmers' fields in Nakuru county, to the wider smallholder farming communities.