

## Innovative app for chicken feed nearly doubles profits in pilot test with farmers in Tanzania

*IITA supported pretesting of app that resulted in considerable reduction in costs of feed and an increase in the average weight for broilers*

[FeedCalculator](#), an app that generates affordable quality feed recipes for poultry from locally available ingredients, has the potential to be a game changer for poultry farmers as results from its pilot testing saw a near doubling of profits.

The app was co-created by leading Dutch nutritionists and livestock experts in partnership with farmers in developing countries, and was tested by the NGO called BRAC and IITA in Tanzania. It will be available this December in the Google Play Store and will be free for all smallholder poultry farmers all over the world.

The pretest results showed that broilers fed using recipes suggested by the app had on average 15% higher weight and that the app on average reduced



*Chicken feed made following calculations from the app.*

the cost of feed by 31% compared to regular commercial feed. This resulted, on average, to 80% higher profit due to lower feed costs and higher weight of the birds.

The farmers involved in the study divided their broilers into two batches and fed one half with the usual feed and the other

with the self-prepared FeedCalculator mix and after six weeks compared animal growth and feed costs. A total of 4,400 birds were involved in the study.

Frederick Bajjukya, a scientist at IITA and coordinator of the N2Africa project, said most of the farmers the project works with, and especially women, also keep

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## IITA-Zambia hosts Swiss Ambassador, delegation

IITA-Zambia hosted a visit by a high-level Swiss delegation led by His Excellency Mr Arthur Mattli, Swiss Ambassador to Zambia and the East Africa Region, on 29 November. He was accompanied by a team from the Swiss Development Cooperation (SDC) Office for Southern Africa based at the Embassy of Switzerland in Harare, Zimbabwe composed of Ms Brigitte Oederlin, Deputy Director, SDC, and Mr Bulisani L. Ncube, Senior Regional Programme Officer, Food Security and Agriculture Program, SDC.

The Swiss delegation was received by IITA-Zambia scientists and staff led by

David Chikoye, IITA Regional Director for Southern Africa, as well as members of the Zambia Youth Agripreneurs (ZYA).

The visit was intended to familiarize the SDC with IITA's activities and projects in the region, particularly in areas related to SDC's policies such as improving household nutrition, water management, climate smart agriculture/climate services for agriculture, and youth involvement.

"First, I would like to congratulate IITA on your 50<sup>th</sup> anniversary. There are but a few international research centers in the world that have reached this milestone,"

said Ambassador Mattli at the start of the visit. "This visit is part of the SDC's multi-country exploratory mission in southern Africa to see how we can work with partners in the region in the context of our Food Security and Agriculture Program," he explained.

"In 2018, SDC will start on a new medium-term, 5-year strategy in which we will focus on seeds and seed systems, disaster risk reduction related to climate change-induced shocks, climate-related services, integrated water resource management, youth in agriculture, and gender and HIV mainstreaming," Ncube added. "In this strategy, we will

also focus on five countries in southern Africa—Zambia, Zimbabwe, Lesotho, Malawi, and Swaziland.”

“We wanted to know what IITA could offer with regard to these priority thematic areas,” Ms Oederlin reiterated, briefly summarizing the objective of their visit.

In response, Chikoye briefed the Swiss delegation on IITA’s past and ongoing research activities and projects in the region, specifically relating them to SDC’s identified priority areas. “We have a strong portfolio of projects and programs in southern Africa that fits perfectly with SDC’s policies,” he said. He expounded on this by making a presentation about IITA and our work in the region, which was supplemented by presentations by Pheneas Ntawuruhunga (on soybean and cassava research), Juliet Akello (on nutrition and food safety), and Cynthia Chibebe (on the Zambia Youth Agripreneurs program).

The Q&A that followed the presentations raised some very important focal areas on which to establish a possible formal partnership between IITA and SDC. These included mitigating climate-induced shocks to farmers through agricultural interventions, seed systems, food and nutrition science, food safety, and gender and youth in agriculture and agribusiness.



*David Chikoye with other Southern Africa Hub colleagues briefing the Swiss delegation.*

After the discussions, the Swiss delegation were given a tour of the SARAH campus, during which they were shown the cassava field trials, mechanized irrigation system, and the ZYA-operated cassava processing center and vegetable plots.

Ambassador Mattli was exceptionally impressed by the activities of ZYA in cassava value addition. Upon sampling *titbits*—a cassava-based food product and one of several prepared by the youth for the visit—he exclaimed, “This is exquisite! I would have never known

that this was cassava if you had not told me.”

At the end of the visit, Ambassador Mattli handed Chikoye a symbolic parting gift—a pen. “On behalf of the Swiss Embassy and the SDC, I would like to thank you, your staff, and the youth for hosting us here today. We learned a lot about IITA and the good work that you are doing in the region. Please receive this pen as symbol of our future partnership and we look forward to signing many agreements between IITA and the SDC,” he concluded.

## **Innovative app for chicken feed... Continued from page 1**

poultry. “One of their challenges is the low productivity from the chicken due to poor nutrition. The farmers didn’t have the technology to make good feed formulation. We therefore selected Single Spark, as they have a state-of-the-art technology, which can be used to formulate animal feed. And so we started the pilot.”

The pilot was held in three regions in Tanzania (Gmboto, Tegeta, Kimandolu) with 19 farmers. Staff from IITA and BRAC were first trained on the app and they trained the farmers taking part in the pilot study.

Jazira Rashid, BRAC Program Organizer, said: “The farmers were very excited about this knowledge. You buy your raw materials by the quantities prescribed and you just mix it. It is much cheaper.”

“Due to FeedCalculator I improved my produce and doubled my income in just

6 weeks,” said Amina Shemsi, one of the poultry farmers that took part in the pilot study. Halima Mustapha, another poultry farmer using the app concurred: “By using the knowledge of the FeedCalculator, my chicks are growing faster. They are heavier and healthier compared to before.”

Single Spark, the company behind the app, noted that many livestock farmers have serious difficulties making a profit from their livestock due to costly feed. Peter Meijer, from Single Spark, says that on average 70% of the production costs of poultry go to feed as farmers buy costly commercial (imported) feed. A cheaper option is to buy locally mixed feed but the quality is unknown and often poor. Empowering farmers to make their own feed recipe is the solution.

“Feed formulation is very complex. Mixing high-quality balanced feed with the right energy levels, for the lowest price and

for the whole year is complex. And that is why we developed the FeedCalculator.

“After several tests and pilots and with the support of BRAC and IITA, it is now time for farmers all over the world to benefit from it. We ask other NGOs to join our mission of empowering farmers to produce their own affordable, quality feed,” Meijer said.

### **How the app works**

The app simply asks farmers to enter: (i) animal breed, (ii) age of animals, (iii) number of animals, and (iv) all the available local ingredients and prices. Based upon this data, the app calculates the most cost-efficient feed mix using algorithms of leading feed experts. The app is free for poultry farmers with less than 1000 chickens. Larger farmers will need to pay a fee of \$50 per year or \$10 per two months. The app can be downloaded from the Google Play Store or for more information see [www.feedcalculator.com](http://www.feedcalculator.com).

## IITA and Congo Basin Institute host phylogenetics workshop

Inqaba Biotech conducted a 5-day professional development workshop on phylogenetics at the IITA and Congo Basin Institute (CBI) campus in Yaoundé. The workshop was a refresher on the basics of handling phylogenetic data.

Researchers from IITA, CBI, Bioversity International, Centre Pasteur, the Universities of Dschang, Yaounde I, Maroua, Bamenda, and Buea, and other research institutions in Cameroon came together to get hands-on experience on analyzing phylogenetic data. The workshop facilitator, Dr Jane Wright from the University of Pretoria and Consultant to Inqaba, led all course modules. She first covered phylogenetics generalities followed by text editors, file saving, chromatograms, data mining and sequence alignment, construction of phylogenetic trees (distance methods, bootstraps), and primers design. All these topics were covered using available software and online resources.

The participants expressed gratitude for this opportunity to develop their knowledge and skills on phylogenetics and to connect with the different institutions. A modern molecular genetics lab at IITA and CBI provides students and researchers with tools and resources to carry out the phylogenetics research.

At the end, Rachid Hanna, IITA Country Representative thanked Inqaba for



*Dr Wright (first from left) and other stakeholders during the workshop.*



*Group photo of participants.*

choosing the IITA campus for the workshop and looked forward to strengthening this private–public sector collaboration. He also encouraged participants to make the best of the knowledge and tools they have gained

in this course to further their skills in phylogenetics. Wright offered to further assist participants in the analysis of their phylogenetics data should the need arise. The workshop ended by awarding certificates of participation.

## Educator encourages youth to attain success in business

The co-founder of Lifeforte International Schools (LIS), Sarah Olubi-Johnson, gave a seminar presentation at IITA on 1 December to mentor and motivate the youth towards establishing successful enterprises in Nigeria.

The seminar, themed “Building a successful business in Nigeria’s challenging environment,” incorporated her book titled “Dare to dream and succeed in a harsh economic climate” stimulated among the IITA Youth Agripreneurs (IYA) and IITA Corps

members an interest and passion for agriculture and encouraged them to apply some of the principles that have guided her in life. The meeting, which aimed at igniting interest in business opportunities among the youth, was attended by IITA staff, IYA, IITA Corps members, representatives from the IITA Women’s group, and a team from LIS.

In her lecture, Olubi-Johnson emphasized that reformatting the mind is an important element in attaining greater heights in life. “We must start

with a desire and decision to change the old standard, but to do that, we need a new standard which is having the right business ethics devoid of deception,” she added.

Speaking at the opening ceremony, Evelyn Ohanwusi, Interim Head of the Youth in Agribusiness Office, acknowledged the resource person for nurturing and inculcating first-hand knowledge that will enable the youth to develop and grow in their respective enterprises. “This is a great exposure

to a real life situation, and I encourage all the participants, especially the IYA, to share and learn from her wealth of experience, and help change mindsets geared towards creating impact through capacity development in the lives of other youth in Nigeria.”

At the exhibition and tour of the Akinwumi Adesina Agripreneur (AAA) building and IYA enterprises, which include fish ponds and vegetable fields, Olubi-Johnson said: “Truly I am impressed with IITA’s innovation; we are indeed convinced that IITA is a first-class institution working tirelessly to improve livelihoods in Africa. Personally I am proud of the indomitable IYA for their good work, and together we will move Africa forward.”



*Dr Sarah Olubi-Johnson addressing the youth during the seminar.*

The meeting ended with a gift presentation by IYA to Olubi-Johnson to express their immeasurable gratitude for her coaching in ensuring they succeed in life.

## Sustainable intensification book now on open access

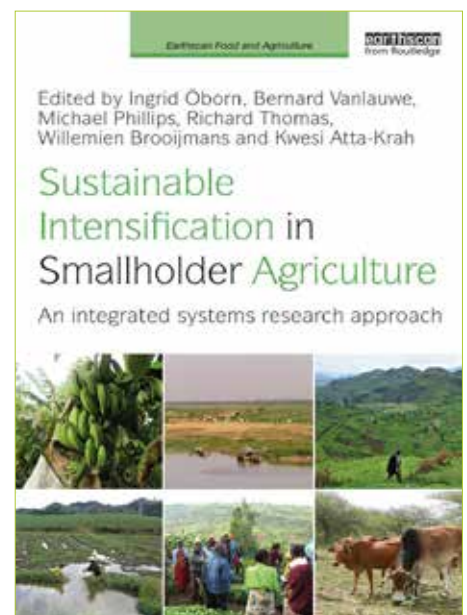
In compliance with IITA’s Open Access policy, the recently published Routledge book titled “Sustainable Intensification in Smallholder Agriculture” is now available online.

The book focuses on the sustainable intensification concept and showcases its ecological, economic, and social dimensions, and describes different aspects of systems research in agriculture in its broadest sense.

Much of the work represents outputs of the three CGIAR Research Programs on Integrated Systems for the Humid Tropics (led by IITA), Aquatic Agricultural Systems, and Dryland Systems. There are four central themes around which the chapters are based: the conceptual

underpinnings of systems research; sustainable intensification in practice; integrating nutrition, gender, and equity in research for improved livelihoods; and systems and institutional innovation. Case studies are taken from countries and agroecological zones in Africa, Latin America, Southeast Asia, and the Pacific.

The book was published as part of the Earthscan Food and Agriculture series and was edited collaboratively by Ingrid Öborn, Bernard Vanlauwe, Michael Phillips, Richard Thomas, Willemien Brooijmans, and Kwesi Atta-Krah. Digital copies of the book can be downloaded at <https://cgspace.cgiar.org/handle/10568/89642>.



## Announcements

- **ATTC annual project review meeting**, Senegal, 27–29 November
- **Introduction to Liquid Chromatography and Mass Spectrometry**, IITA, Yaounde, Cameroon, 26–29 December

Got a story to share? Please email it with photos and captions every Wednesday to [iita-news@cgiar.org](mailto:iita-news@cgiar.org) or Katherine Lopez ([k.lopez@cgiar.org](mailto:k.lopez@cgiar.org)) and Uzoma Agha ([u.gha@cgiar.org](mailto:u.gha@cgiar.org)) for headquarters and Western Africa, Jeffrey T. Oliver ([j.oliver@cgiar.org](mailto:j.oliver@cgiar.org)) for Southern Africa, Catherine Njuguna ([c.njuguna@cgiar.org](mailto:c.njuguna@cgiar.org)) for Eastern Africa, and David Ngome ([d.ngome@cgiar.org](mailto:d.ngome@cgiar.org)) for Central Africa.

## N2Africa success stories

### Meet Julie Bwire: The inspiring ambassador of soybean in Tanzania

Julie Bwire is a mother of three and a farmer at Msufini village in Mvomero District, Morogoro Region, eastern Tanzania. She dropped out of school in the late 1980s and until 2015 was engaged in petty trading as well as farming; mostly maize and vegetables.

In January 2015, on the advice of Margret Mongi, the extension officer of Msufini village, Julie and 24 other farmers who were members of the farmers' group "Umoja" (partnership), joined the N2Africa project where they learned about improved methods of growing soybean and common beans alone or intercropped with maize, and the use of fertilizers on legumes and inoculating soybean with rhizobia inoculants.

*"Soybean was a new crop to most of us. Our extension officers and the IITA scientist encouraged us to grow it and demonstrated good agriculture practices through the well-established demonstration sites. We were inspired to grow soybean after we observed its high yield and learned about its other benefits such as high nutrition and soil fertility improvement,"* says Julie.

A new opportunity presented itself in June 2015 when N2Africa recruited Julie to participate in a training on soybean processing and utilization. The training focused on household-level processing of soybean into various products including milk, coffee, flour, and various recipes using soy flour.

After training, Julie contacted N2Africa and the small-scale industrial development office (SIDO) for more support to venture into soybean processing. N2Africa provided her with a solar drier and SIDO with packaging materials, and in January 2016, Julie started selling fortified soybean flour with pro-vitamin A maize, finger millet, rice, and orange-fleshed sweet potato. Her products are currently selling at US\$1.36 per kg making a net profit of \$272 per month.

Through the money earned, Julie has ventured into rearing local chickens and has earned a total of \$817.2. She



Julie holding the nutritional soy flour.

also managed to renovate and extend her house.

*"With this kind of income, I will never stop growing soybean. My family is happy and healthy and we now enjoy a better standard of life,"* says Julie.

But, that was just the beginning of the transformation. In June 2016 Julie became an ambassador of soybean. She opened a kiosk to sell milk and her products and on the side, she set aside a room with educative materials targeting pregnant women and mothers on the importance of soybean-based food in their diet and on how to balance baby meals for healthy living. Julie now has advanced to become a community health attendant going back to her earlier dream of becoming a health officer. She now teams up with Ms Mwanahawa Athumal, a trained community health officer, to train pregnant women and mothers in Msufini and neighboring villages on the health benefits of soybean.

*"Soybean flour has greatly reduced malnutrition for many children in my village and nearby villages. It improves the mental capacity of users and increases the weight of undernourished children,"* Julie comments on the impact of her work.

In 2017 Julie was awarded \$682 by Morogoro's Regional Commissioner as the best farmer and food processor

at village level. This was during the National Agriculture Exhibition show, Nane-nane.

### Increasing availability of cowpea seeds

*Improved cowpea varieties and good agricultural practices increase availability of quality declared seed and income to farmers of Tubugwejuu village in Kongwa District, Dodoma Region*

Before the N2Africa project, farmers in Kongwa District had abandoned cowpea production due to poor crop management, unavailability of improved varieties, high pest and disease infestation, the effects of climate change, and poor access to inputs that in turn led to poor harvests. They had instead moved to cultivating high-value horticultural crops like tomato, cabbage, and onion, which gave huge harvests and a good market price.

The N2Africa project started implementing its activities in Kongwa District in 2016. In collaboration with the Homboro Agricultural Research Institute and the Kongwa District Agriculture, Irrigation and Cooperative Officer (DAICO), the project trained farmers and extension officers on new technologies for cowpea and groundnut production.



Farmers evaluating performance of cowpea and fertilizer use.

The project introduced improved, early maturing varieties of cowpea (Raha, Tumaini, and Vuli-1) and appropriate use of the fertilizer DAP and herbicides and pesticides.

### Success!

The participating farmers adopted improved production practices that were demonstrated and recommended to them. As a result, in the 2016/2017 season, they were able to harvest 20 kg from a plot of 10 m × 10 m. This is equivalent to 800 kg/acre. The potential yield of cowpea in Tanzania is about 600 to 800 kg/acre.

Azizi Mbwana Msonde (61 years old) is a member and the chairperson of one of the participating farmers' groups, *Umoja wa vikundi vya umwagiliaji-Tubugwe* which has 20 members (13 men and 7 women) at Tubugwejuu village, Kongwa District, Dodoma Region.

He joined the N2Africa project because he was eager to learn about improved technologies to get higher yields and more money. He started production of

cowpea quality declared seeds (QDS) for the 2016 /17 season after receiving training.

As a lead farmer, he also trained 20 of his colleagues on the principles of production of QDS using one acre as a demonstration plot for seed multiplication.

"I taught them major principles of QDS production, which include site and seed selection, early land preparation and planting, the use of DAP as a basal fertilizer, spacing, gap filling, timely weeding, pest control using insecticides, timely harvesting, proper drying, threshing, winnowing, and proper storage using airtight PICS bags," he said.

Azizi managed to harvest 700 kg of cowpea QDS per acre at his demonstration plot. From the harvest, he has already sold 600 kg at Tsh.2000 (\$1) per kilogram and earned a total of Tshs 1,200,000 (\$600).

The N2Africa project will use the QDS bought from Azizi to circulate to other farmers to meet the high demand for



Members of the *Umoja wa watuamijaji maji* group show the remaining cowpea seed after harvest and selling.

improved cowpea seed in the next season of 2017/2018.

The major lesson he learned through the N2Africa project was that involving farmers in the production of QDS eases access to seeds for many rural farmers because there are few inputs stockists in many Tanzanian villages.

## Breaking news: TAAT has been approved!

Good news! The Technologies for African Agricultural Transformation (TAAT) project to be led by IITA has finally been approved by the African Development Bank's Board of Directors! According to Deputy Director General for Partnerships for Delivery Kenton Dashell "For there to be real transformation of agriculture in Africa all the major players including Governments, the private sector, major investors, and development organizations will need to work together and TAAT will be proactive in promoting these partnerships. This is a great day for IITA and it takes us one step closer to Transforming African Agriculture."