



Smart Food updates

Collaborating with celebrity chefs in London, Paris and West Africa



Left to right: Chef Anto Cocagne Source: www.lechefanto.com, Chef Mick Élysée Source: www.facebook.com/pg/chefmickelysee/ photos and Chef Aissatou M'Baye Source: www.instagram.com/aistou_cuisine/.

Three celebrity chefs from Gabon, Congo and Senegal are finding new takers for millets and sorghum in Europe, with innovative recipes featuring a touch of 'home'. The chefs tied up with the Smart Food campaign to show these cereals can effortlessly be turned into tasty food.

Chef Anto Cocagne from Gabon based in Paris

Originally from Gabon, [Chef Anto Cocagne](http://www.lechefanto.com) has become a star of gastronomy and television in France. The Paris-based chef proposes a minimalist African cuisine with a 'French touch'. Influenced since her childhood by both her grandmother who was very passionate about her kitchen, and her mother, a professional nutritionist, Chef Anto is very enthusiastic about the Smart Food campaign.

"My mother used to be involved in similar projects. I can easily understand the importance of the Smart Food campaign, and am very happy to contribute to it."

In 2018, Chef Anto created and produced four recipes as part of the Smart Food campaign. These recipes were promoted at the festival '[We eat Africa](#)' (the African cuisines festival), where Chef Anto is the President of the organizing committee, and in the magazine '[Afro cooking](#)', where she is a consultant. As part of the Smart Food campaign, Chef Anto promoted the recipes during a highly popular radio program of Radio France International.

The recipes are inspired by African, European and Indian cuisines. They include [sorghum crackers](#), [sorghum flour cupcake](#), [African Buddha bowl](#), [creamy millet and speculoos cake](#).

Chef Mick Élysée from Congo based in London

Chef Mick Élysée is a London-based chef specializing in Congolese-French and African food. His love for the culinary arts started when he was very young in his home country of Congo. [Now, he is a reference in the field of gastronomy in UK](#). In 2018, Mick joined the Smart Food campaign and contributed two [millet](#) and [sorghum-based](#) recipes that he is now promoting through various channels.

"The first time I heard about millet and sorghum was when a representative of ICRISAT contacted my team to ask if I could be the face of their new campaign, Smart Food. I had no idea about the huge benefits of millets and sorghum until then," Chef Élysée says.

"I am an artist and a chef. Diversity is what makes my art interesting. I can now develop many recipes with these cereals. Having healthy and affordable alternatives such as millets and sorghum in one's diet means less routine and better food habits for people. It is such a good alternative and the options are endless. Millet is as easy as quinoa or rice to cook, but can also be used as flour for pancakes and

cakes, or as cereals just like oats or chia seeds,” he explains.

“Millets and sorghum are full of vitamins, minerals (phosphorus, zinc, iron, etc.) and affordable, but most importantly, very tasty! In October 2018, I was invited to FPJ Live event at UK, where I was happy to introduce sorghum and millet to professionals in the industry by cooking live a mackerel ceviche with millet salad. I knew that my mission was a success when I received lots of positive feedback at the end of the event,” Chef Mick Élysée concludes.

Senegalese Chef Aissatou M’Baye in France

In 2017, France-based Senegalese Chef, Aissatou M’Baye, launched five Smart Food recipes after becoming an ambassador for the campaign. Chef M’Baye set out on social media to demonstrate new ways of cooking millets and sorghum for a West African audience but her recipes found many takers in Europe as well.

“Millets and sorghum are rich in micronutrients and yet, have been neglected from our diets for a long time. So, it was necessary to think of new recipes to transform these Smart Foods into a savory menu. We managed to create some cool recipes, and at the same time communicate the benefits of Smart Food,” says Chef M’Baye.

Building culinary skills with a wide range of activities across West and Central Africa

From being blogged about to being showcased at international events, the Smart Food initiative is gaining support from chefs to politicians in West and Central Africa (WCA), and in its wake, overturning dated notions about dryland cereals.

Blogging for dryland cereals

Dienaba Traore is the CEO of ‘[Gabougouni](#)’, a blog that promises to show new ways of using millets and sorghum. She joined the Smart Food campaign in October with four new recipes of millet and sorghum foods.

Dienaba says she had long been working in food safety for airlines before landing in Bamako as an influencer. On 13 October, she conducted the first Smart Food Masterclass in Mali, participants of which were the winners of a special Smart Food quiz organized online via Facebook and Instagram.

“On Gabougouni, I try to promote African dishes. My aim is to contribute towards modernizing African cuisine so that it is less complex and more attractive to the world. The Smart Food campaign is well aligned with the objectives of Gabougouni. I am happy to join the initiative.”

Showcasing value in Smart Food at international events

The Smart Food Mali campaign made a splash at the International Agricultural Exhibition of Bamako, locally known as SIAGRI. This important agricultural event organized earlier this year aims to promote food

Chef M’Baye publishes her recipes on the blog Aistou Cuisine. Her recipes were a big hit when the first Smart Food social media campaign launched in October 2017. Even after the campaign ended last December, her recipes continue to gain traction online.

Together, the campaign was able to reach 473,222 people. A survey conducted in December 2017, showed that the videos of the five recipes promoted online clocked 85,657 minutes (1,428 hours) of viewing time.

For more:

- Blog post <https://aistoucuisine.com/produit-locaux/mil-sorgho-legumineuses-a-grains-smartfood-icrisat/12/10/2017/>
- In the news: <http://agricnation.com.ng/2018/05/21/senegalese-chef-champions-the-benefits-of-smart-food-through-social-media/>
- Smart Food recipes:
 - Peanut Smoothie (in French) (over 47,000 views) - <https://www.facebook.com/aistoucuisine/videos/1508851159208179/?t=16>
 - Sorghum Souffle (in French) (over 70,000 views) - <https://www.facebook.com/aistoucuisine/videos/1499540286805933/?t=0>

entrepreneurs in the agriculture industry.

Dr Nango Dembélé, Malian Minister for Agriculture, visited the Smart Food exhibit. He was briefed about the campaign’s objective of developing sustainable value chains for millets and sorghum.



Culinary blogger Dienaba Traore. Photo: www.gabougouni.com

The Smart Food hashtag at the exhibition was a big hit as visitors clicked photos with it and shared on social media. The exhibition was an opportunity to convey the adaptability of dryland cereals to climate variability in the semi-arid tropics.

Meanwhile in Accra, Ghana, Dr Ramadjita Tabo, Regional and Research Program Director, ICRISAT- WCA introduced the Smart Food initiative at the Food and Nutrition Security Conference held in October. He described the campaign’s vision to promote healthy food made from dryland crops like millets and sorghum, which are sustainable for the environment and good for producers.

Senior Sorghum Breeder in WCA, Dr Aboubacar Toure, attended a high-level panel discussion organized by the FAO in Mali on World Food Day. He presented the Smart Food initiative and outlined how it can contribute to fighting hunger, malnutrition and improve nutrition.

Young chefs heat up India's first Smart Food reality show

Who will be the Smart Food student chef of India?



Photos: S Punna, ICRISAT

Left to right: A millet dessert prepared by student chefs; a chef engrossed in cooking during the play-offs; a three-course meal presented with an assortment of millets in the backdrop.

Fourteen finalist young chefs from across India will fire up the burners to be crowned the country's star Smart Food student chef. Paired as seven teams they will take on the challenge of pleasing the palate of celebrity judges and Smart Food experts at the Grand Finale of the Smart Food Culinary Challenge on 19 January 2019 in Bengaluru.

The Grand Finale will be held live during the 'Organics & Millets 2019 – International Trade Fair', at the Bengaluru Palace, Saturday, 19 January 2019.

[Click here](#) for the exciting teaser with culinary ambassadors fighting it out to make the final cut.

The competition kicked off with 28 teams from 16 culinary institutes across India conducted at

MS Ramaiah University of Applied Sciences on 5 December. Young chefs impressed the judges with three-course hearty meals with delicately spiced dishes — grilled veggies/meats, bright salads, freshly baked breads and soups. See about the play offs [here](#).

The Smart Food Culinary Challenge will be the first-ever culinary 'reality show for a cause' in India. Boosting millets among the culinary community, the drama-documentary captures the journey of these student chefs in their attempts to bring innovative millet cuisines to the table.

Described by judges as crisp, light and fresh, the inspiring dishes by these chefs are all set to bring Smart Food into the circular of chefs and back to the tables across the country.

Skills of students of top culinary schools including the Institute of Hotel Management, Indian Institute of Hotel

Management and Culinary Academy of India and the host institute MS Ramaiah University of Applied Sciences were put to test in both traditional to continental cuisine.

From foxtail millet-banana flower biryani to pearl millet ghevar, the dishes were judged by an eminent panel comprising Chef Ramaswamy Selvaraju, Vivanta by Taj, Chef Vinod K Batti – IKEA Food, Dr Anitha Seetha, Nutrition Scientist, ICRISAT, and Ms Suchitra Muralidharan, celebrity Chef from Kannada cooking show Oggarane Dabbi (Spice Box). Celebrity Chef Ranveer Brar will also join the judging panel in January.

The panel selected the top seven dishes based on the appropriate use of millets, accompaniments, taste, portion size, the degree of complexity and overall garnishing and presentation style.

The International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) and M S Ramaiah University of Applied Sciences have devised this Challenge and partnered with the Government of Karnataka to bring this to the masses.

The 'Organics & Millets 2019 – International Trade Fair' is being organized by the Dept. of Agriculture, Govt. of Karnataka, in collaboration with Karnataka State Agricultural Produce Processing and Export Corporation Limited (KAPPEC) as the Nodal agency, International Competence Centre of Organic Agriculture (ICCOA) as the Knowledge Partner, and MCA as the Event Partner.

Smart Food is founded by ICRISAT and coordinated in India for millets, in collaboration with Indian Council of Agricultural Research (ICAR) - Indian Institute of Millets Research.

First Smart Food Culinary Symposium prepares ground for change in millets industry



(Left to right) Chef Ramasamy Selvaraju, Executive Chef, Vivanta by Taj; Mr Sreenivas Murthy, Principal Secretary, Government of Karnataka; Dr Jagadeesha, Commissioner, Department of Agriculture, Government of Karnataka and Prof Govind Kadambi Pro-Vice Chancellor, MS Ramaiah University of Applied Sciences.

The first of a series of India-wide [Smart Food Culinary Symposia](#) was organized for chefs from major fine dining chains and food service representatives in Bengaluru. Experts from government, training, nutrition and agriculture were on hand to ponder over challenges and opportunities. Millets were the center of discussions, and approaches to help develop the industry were discussed with Dr Jagadeesha, Commissioner, Department of Agriculture, Government of Karnataka.

The symposium was jointly conducted by MS Ramaiah University of Applied Sciences, Government of Karnataka and the International Crops Research Institute of the Semi-Arid Tropics ([ICRISAT](#)).

It was convened by chefs and representatives from leading fine dining establishments (The Embassy Group, Vivanta by Taj, Oberoi hotels, IKEA), health food companies and craft brewers (Growfit, Lipi Restaurant, The Biere Club, Jus Amazin Food & Beverage Pvt Ltd, Toit Brewpub) and Bruhat Bangalore Hotels Association.

The meeting was chaired by Dr Jagadeesha. Prof Govind Kadambi, Pro-Vice Chancellor, MS Ramaiah University and Chef Ramasamy Selvaraju, Vivanta by Taj, Bengaluru, discussed the opportunities and bottlenecks in introducing millet food options in fine dining kitchens.

Chef Vikas Seth, Culinary Director at The Embassy Group, shared his success story on introducing finger millet (ragi) tacos and the concept of using local ingredients to make global cuisines. He also noted the importance of popularizing regional cuisines with millets and making such foods a part of the hospitality and tourism industry.

Sharing findings from the nutrition study – ‘Providing millet meals as part of Mid-day meal scheme’, which was done in association with The Akshaya Patra Foundation, Dr Anitha Seetha, Nutrition Scientist, ICRISAT, brought to focus the importance of designing simple menus which can be cooked in centralized kitchens.

Apart from the lack of awareness of nutritional benefits, a key concern raised by the restaurateurs is the cost of millet grains in comparison to rice and wheat. In reply, Dr Jagadeesha outlined efforts by the Government of Karnataka to bring down the cost of millets. The first is setting up the Karnataka State Agricultural Produce Processing and Export Corporation Ltd ([KAPPEC](#)) and organizing the Organics & Millets 2019 - International Trade Fair to facilitate direct procurement from farmers. The second is a plan to set up more small-scale millet processing units to reduce the processing cost.

Chef Sridhar Krishnan from Nutrition and Nutraceutical Research Centre, MS Ramaiah University, spoke about the need for research in defining appropriate varieties and quantity of millets to bring out the nutritional benefits while balancing the taste of the dish.

During the concluding remarks, Dr Jagadeesha thanked MS Ramaiah University and ICRISAT for the support towards Karnataka Millet Mission and invited the participants to attend the [Organics & Millets International Fair](#) from 18 - 20 January 2019 at the Bengaluru Palace.

The symposium was held at MS Ramaiah University on 7 December.

Placing Smart Food in industrial canteen menus

Opportunities and challenges to bring millets into industrial canteens were brought to the table at an event held in Bengaluru to create awareness of millets among industrial caterers and to highlight the government's role to assist. Noted chefs showcased the use of millets in recipes during discussions.

Industrial caterers serving corporates expressed the need for food that is popular, widely accepted and inexpensive. The cost of millets vis-à-vis rice and wheat, and the limited awareness, were seen as the biggest challenges to millet introduction in corporate food culture.

While acknowledging the need for variety and taste, Ms Deepti Tripathi, Program Manager, The Akshaya Patra Foundation, shared how the pilot study by ICRISAT successfully introduced millets for children. The millet menu designed was widely accepted and satisfied the nutritional demands for improving the health of the children.

The success story of Growfit, a Bengaluru-based health food company that has introduced exclusive millet meals in their menu, was also showcased during the discussion. CEO of Growfit, Ms Jyotsna Pattabiraman, stressed the importance of research and conducting trials to develop recipes that can be widely accepted.

Dr Meghana Pasi from Aarogya World, a global health non-profit organization, added that millets are nutritious carbohydrates and should be used as substitutes for other grains, but should not replace vegetables. Ms Hema Arvind, Chief Dietician, Ramaiah Memorial Hospital, briefed about millet varieties and their nutritional value.

A demonstration session by Chefs Shyam Prasad, Shashi Sharma, Sridhar Krishnan and Manishkumar Khorwal of MS Ramaiah University showcased the use of millets in traditional breakfast, snack and dessert recipes. The session also showed participants how rice and wheat can be substituted with millets.



(Left to right) Ms Jyotsna Pattabiraman, CEO Growfit; Mr Maheshwar Rao, Principal Secretary, Agriculture, Government of Karnataka; Dr Meghana Pasi, Aarogya World and Ms Deepti Tripathi, The Akshaya Patra Foundation at the event.



Chefs cook millet-based foods for industrial canteens at the event in Bengaluru.

Mr K Ramappa, Additional Director of Agriculture, Organic Farming, Government of Karnataka and Prof Govind Kadambi, Pro-Vice Chancellor, MS Ramaiah University, addressed representatives from catering staff of the Indian Air Force, Bharat Electronics Limited and Indian Space Research Organization (ISRO). Bengaluru's industrial caterers including Masterchef Catering Services, Rajpurohit caterers, Zenith Food Solutions, Hunger box and Compass India were also present. Health food companies, representatives from the Association of Women Entrepreneurs of Karnataka (AWAKE) and food technology students were among the participants.

The discussions also recognized the need for awareness programs among consumers for successful introduction of millet food. Mr Maheshwar Rao, Principal Secretary, Agriculture, GoK, expressed interest to collaborate with industrial caterers and organize awareness programs on millets.

The event, 'Introducing Smart Food into industrial canteen menus' was organized by MS Ramaiah University of Applied Sciences and the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), with support from the Government of Karnataka on 15 December. [It was the third in a series of events which included a Smart Food Symposium for Fine Dining Kitchens and Smart Food Culinary Challenge for young Chefs.](#)

The event was organized in the run-up to the ['Organics & Millets 2019 – International Trade Fair'](#), 18-20 January 2019 at the Bengaluru Palace.

Promoting dual-purpose sorghum and vegetable sack gardens for better nutrition in Mali

Demonstration of improved, dual-purpose sorghum varieties and an innovative method called vegetable sack garden generated great interest in local farmers in Sikasso, Mali, recently. Farmers and agricultural scientists discussed ways to scale up these technologies for wider impact.

The improved dual-purpose sorghum varieties (Soubatimi, Peke and Randiougoucouira), with high grain yield for human consumption and green biomass for animal feed, were highly appreciated by farmers who participated in the field days. Farmers observed demonstrations of different fertility management scenarios ('no fertilizer'/'DAP+urea'/'cow manure'). Dr Baloua Nebie, Sorghum Breeder, ICRISAT, said, "Most farmers preferred Soubatimi, which gives an excellent response to fertilizer application."

Soubatimi, with grain size and yield higher than existing varieties in use, gained popularity because it is early maturing, and therefore, more resistant to drought and heat stress. Farmers said the variety was also liked by their livestock as it is low in lignin, soft and palatable.

A vegetable sack garden technology by World Vegetable Center and partners was also exhibited on the occasion. This technology involves preparation of soil in sacks with application of manure that is available around the homestead. "As the technology is being used near home gardens, the follow-up is easier by both adults and children," explains Dr Jean Baptiste Tignegre, Scientist, World Vegetable Center. Growing vegetables in sacks helps rural women fight malnutrition. For young mothers with reduced mobility, growing vegetables in the family compound gives improved access to nutrient-rich vegetable. The technology also addresses the major concern of many women farmers who cannot own land for farming.



Photo: Jonathan Odhong/IITA

A group of women in Sirakele Village, Sikasso region of Mali serve porridge as part of Africa RISING'S endeavor for nutrition sensitive agriculture. The project is working with women having children aged 4 - 8 months in southern Mali.



Photo: Jonathan Odhong/IITA

Baloua Nebie (ICRISAT) explains the outcomes of sorghum variety demonstration to visitors at the Madina technology park in Bougouni District, southern Mali.

Held at the technology parks of Madina at Bougouni and M'Pessoba at Koutiala during 17–19 October, these events offered a great opportunity to [Africa RISING](#) project scientists to introduce proven technologies and discuss scalability of promising technologies with farmers.

Dr Birhanu Zemadin, coordinator of the Africa RISING project in Mali, said, "Dual-purpose sorghum varieties and vegetable sack gardens are two of the many validated technologies under this project. We will continue testing and validating more technologies to suit the demands of the rural communities."

About 300 participants, including women and students, attended the event in Bougouni, while 310 others were registered in Koutiala district.

Such field days organized on a yearly basis during the cropping season aim to creating awareness about available and proven technologies that are ready for scaling. [See here](#) for other technologies that have been disseminated.

[Click here](#) to know more about ICRISAT's work in Mali.

[Click here](#) for more on ICRISAT's work on sorghum.

Project: Africa Research in Sustainable Intensification for the Next Generation (Africa RISING)

Funder: IITA under USAID Feed the Future Program

Partners: Association Malienne d'Eveil au Développement Durable (AMEDD); Cooperatives of the Mouvement Biologique du Mali (FENABI); International Institute of Tropical Agriculture (IITA); Institut d'Economie Rurale (IER); International Livestock Research Institute (ILRI); World Vegetable Center (WorldVeg); Wageningen University and Research Centre (WUR)

This work contributes to UN Sustainable Development Goals



Odisha to move beyond paddy, to focus on millets and legumes

Odisha plans to diversify its agriculture beyond popular cash crops with emphasis on legumes and dryland cereals including millets, the state's Principal Secretary for Agriculture, Dr Saurabh Garg, announced during a recent visit to ICRISAT – Patancheru.

“We want to diversify agriculture beyond paddy in our projects. Legumes and millets are our focus,” he said, while adding that campaigns like Smart Food can aid in the diversification by promoting dryland cereals in the state.

Dr Garg led a delegation from the [Odisha's Department of Agriculture](#) to ICRISAT to study new agricultural technologies and farm practices. The delegation also reviewed the progress of [Bhoochetana project](#) being implemented by ICRISAT in all the 30 districts of Odisha in partnership with the state government.

During interactions with the Director General Dr Peter S Carberry, RPD-Asia Dr Pooran Gaur and other ICRISAT scientists, Dr Garg sought greater involvement of local communities through NGO partners for the sustainability of research interventions. He also called for continued research in the state after completion of projects.

“I strongly urge that we work with local community-based organizations in all the endeavors. The research that we do can continue beyond the project period through Krishi Vigyan Kendras (KVKs). We have now identified that certain KVKs can work on specific crops rather than all of them focusing on the crops available,” he said.



Dr Saurabh Garg, Principal Secretary, Department of Agriculture, Government of Odisha, interacting with ICRISAT scientists.

Dr Carberry recalled the growth in India's pulses output in recent years and said Odisha stands to capitalize on it in a big way. Along with Dr Garg and others, he unveiled Soil Health Cards printed in Odia. The cards provide vital information on soil health to farmers and are currently being distributed as part of the Bhoochetana Project.

The Odisha government's agriculture department plans to distribute around 10,000 cards in the next four months in a mission mode. ICRISAT has already analyzed over 9,000 soil samples and has committed to analyzing 40,000 samples from across Odisha. ICRISAT is also assisting the Odisha government establish two state-of-the-art referral laboratories for soil testing.

Targeted farm interventions made easy with precise soil health diagnosis

Boosting farm soil health in Odisha just got easier. Farmers in the state can now implement targeted interventions thanks to soil health cards being distributed under the Bhoochetana Project.

Six hundred farmers across the state became the first recipients of the cards printed in Odia after distribution began on 5 December, observed as World Soil Day. Government of Odisha and ICRISAT, with 16 NGO partners, tied up in April this year to improve rural livelihoods through scientific management of natural resources. Soil health mapping is one of the interventions planned. Around 40,000 samples are set to be analyzed.

In addition to information on macronutrient content, the soil health cards provide the status of secondary nutrients, micronutrients and parameters like pH.

“Deficiencies in secondary and micronutrients like sulphur, boron and zinc can impact yield. Monitoring these soil traits alongside macronutrients - nitrogen, potassium,

phosphorous, and correcting shortfall can help significantly boost crop productivity,” says Dr Sreenath Dixit, Principal Scientist and Theme Leader, ICRISAT Development Center.

During awareness talks by representatives of the state's agriculture department and ICRISAT scientists, farmers were introduced to tested guidelines on nutrient management, and given crop-specific inputs aimed at enhancing productivity. Representatives of legislators and parliamentarians also participated in the awareness programs held simultaneously across Odisha.

In a similar setting at the ICAR-Central Agroforestry Research Institute in Bundelkhand, UP, the importance of soil testing was conveyed to farmers. ICRISAT, in partnership with 5 NGOs and ICAR, analyzed soil samples in the region only to find widespread degradation of macronutrients, organic carbon and micronutrients. Thus far, around 1,200 soil health cards have been distributed as part of a project aimed at doubling farmers' incomes in the region.

Making smallholder farmers more secure: ICRISAT's contribution to climate research

As nations from around the globe debate the impacts of climate change and discuss sustainable solutions to mitigating them at COP24, we take a look at just a few of ICRISAT's recent initiatives that helped alleviate some challenges from changing climate worldwide, especially in the drylands:

- In 2016, a 'Sowing App' was unveiled for farmers in Andhra Pradesh, India. Equipped with a Personalized Village Advisory Dashboard, this app aids farmers achieve optimal harvests by helping them make critical decisions such as when to prepare the field, when to sow and even what to sow. This is done with the help of an interface between artificial intelligence, weather forecasting models and extensive weather and agricultural data including rainfall over the last several decades for the region. This has been made possible through a partnership between ICRISAT, Microsoft and the Andhra Pradesh government.



Rameswari Devi, a farmer from Andhra Pradesh is one of the beneficiaries of the sowing app.

- Over 1300 smallholder farmers in Mali took home climate-smart agriculture (CSA) techniques to increase farm productivity sustainably when they attended a series of training sessions. They would go on to train more farmers across the region, spreading the knowledge in a cascading fashion. The training included practical demonstrations of CSA techniques such as making Zaï pits (shallow ridged pits dug around plants to trap rainwater) and demi lunes (semi-circular pits with contour bunds to prevent rainwater runoff); preparing organic compost using crop residues; applying biofertilizers by microdosing method; intercropping cereals with legumes (cowpea, groundnut); integrated

Striga management and so on. Additionally, Climate Information Groups were set up in 30 villages for dissemination of climate information (via a platform called Sènèkèla) such as daily rainfall forecast, good agricultural practices, price of cereals in the local market, and crop planting date. These sessions were part of a capacity-building initiative of the project BRACED-X Waati Yèlèma Labenw in partnership with ICRISAT.



Photo: Z Birhanu, ICRISAT

Smallholder farmers in Mali were introduced in groups to Climate Smart Agriculture techniques.

- A new variety of chickpea, which is heat tolerant, resistant to Botrytis grey mold (BGM) and also high yielding, was released as BARI Chola-10 in Bangladesh in April 2017. Bangladesh is often cited as one of the most vulnerable countries with respect to climate change impacts. Farmers here mainly grow rice and follow the rice crop with chickpea. If rice harvest is delayed, chickpea sowing is also delayed, leading to high heat stress during the crop's reproductive phase. This frequently causes low yields and even crop failure. BARI Chola-10, based on ICRISAT variety ICCV 92944, is expected to provide some relief to these farmers.

COP 24 – the 24th Conference of the Parties to the United Nations Framework Convention on Climate Change (UNFCCC) – is currently going on in Katowice, Poland (3-14 December 2018). The Polish Presidency had distilled the key messages this year into three main components:

Technology: Modern technology creating climate-friendly, sustainable solutions for health development

Human: People driving change in lifestyles, regions and industries

Nature: Highlighting forests as a great greenhouse gas sink; and to transform climate, biodiversity and desertification.

With its policy of demand-driven innovation for smallholder farmers, ICRISAT works to make a difference to build adaptability to climate change among smallholder farmers, one technology, one improved variety at a time.

Improved varieties and quality seed boost yields and profits for Myanmar farmers

The adoption of improved, high-yielding varieties of pigeonpea, groundnut and chickpea has resulted in over 40% higher grain yields and profitability for farmers in the Central Dry Zone of Myanmar. This is the key conclusion of an impact assessment study undertaken as part of [the CGIAR Research Program on Grain Legumes and Dryland Cereals](#).

Timely access to good quality seed plays a vital role in enhancing product quality and achieving better yields for smallholder farmers. Superior cultivars, with tolerance to disease and environment shocks like droughts and floods, can further help farmers adapt to climate change, ensure food security and improve livelihoods.

The study, 'Impact Assessment of the Village Seed Bank (VSB) program for chickpea, groundnut and pigeonpea in the Central Dry Zone of Myanmar, focussing on the production, distribution, productivity and profitability of seed of improved cultivars', analyzes to what extent the VSB program has facilitated adoption of improved legume cultivars, increased productivity and accrued economic benefits.

Funded by the [Australian Centre for International Agricultural Research](#) (ACIAR), the MyPulses project (2014-17) focused on developing improved, high-yielding varieties of pigeonpea, groundnut and chickpea through breeding and selection. Adopting a VSB model for timely production and distribution, Myanmar's Department of Agriculture (DoA) distributed improved seed to over 1,300 chickpea, pigeonpea and groundnut farmers from 495 villages.

To assess the efficacy and the impact of the VSB approach, the research team randomly selected 182 participating farmers from 41 villages for a survey. Quantitative and qualitative research methods were used to generate data on the volume of formal or direct (DoA-VSB farmer-DoA) and informal or indirect (VSB farmer-other farmer) spread improved cultivar seeds, technology dissemination, seed production training programs and impacts on productivity enhancement.

On average, the surveyed VSB farmers used around 50% of their land for legume cultivation. The results show the area cultivated with improved seeds increased from 154 acres in 2015-16 to 460 acres in 2017-18. If the findings were applied to the 1,343 farmers who received seed from the DoA, the area under improved cultivars would amount to 3,400 acres in 2017-18.



Photo: PM Gaur, ICRISAT

ICRISAT is working on developing climate resilient lines of chickpea with resistance to extreme weather conditions including drought, high temperature and salinity.

Key highlights of the study include:

- Benefits of the VSB program include improved access to high quality seed, access to crop and seed production knowledge to increase productivity and profitability.
- 96% of the surveyed farmers rated the improved cultivars as satisfactory, good or excellent.
- Seed production training programs were effective and beneficial to the surveyed farmers.
- Grain yields from improved VSB cultivars were 34% and 43% higher for sole and intercropped pigeonpea respectively, 55% higher for groundnut and 52% higher for chickpea.
- 87% of surveyed VSB farmers indicated their willingness to continue in the program.

The study also suggested the need for improvement in seed storage facilities, improving coverage and development of a marketing program for VSB produced seed. Increased investments and improvements may lead to better yields and income for legume farmers in Myanmar.

Project: MyPulses Project

Funders: Australian Centre for International Agricultural Research

Partners: Department of Agricultural Research and Department of Agriculture, Myanmar

CGIAR Research Program: Grain Legumes and Dryland Cereals (GLDC)

This work contributes to UN Sustainable Development Goals



The right tools for enabling breeding programs to be gender-responsive

Over the past few decades, gender initiatives across CGIAR have created broad awareness among scientists about the need to consider the impact of new agricultural technologies on both men and women. However, even with this heightened awareness, breeding programs typically ask questions about the gender impact of a new plant variety or animal breed only in the final stages of evaluation or release. Women's trait preferences often differ from men's, and consequently, varieties may not be adopted because women's interests were not considered, or varieties that are adopted can even have a negative impact on women's well-being – such as by exacerbating their daily workload or leading to less control over marketing decisions.

In this context the CGIAR Gender and Breeding Initiative (GBI) envisions the development of a comprehensive toolbox aimed at the analysis and incorporation of gender perspectives from the very beginning of a breeding program, right through to implementation and impact assessment. The toolbox will be used to assure the gender relevance of tools in the CGIAR Excellence in Breeding Platform (EiB) but will also provide support to national agricultural research institutes and other breeding programs.

Towards this, the Initiative held a workshop from November 12-13 at Cornell University to create a space for gender specialists, breeders and others to review two prototype tools and jointly work toward their refinement for field testing. The two complimentary tools are the G+ Customer Profile Tool and the G+ Product Profile Development Tool.

"A G+ Customer Profile identifies and disaggregates by gender the users for a specific product of the breeding program," says agricultural economist, Alastair Orr, who presented an overview of the tool.

"So just as a product profile defines the new breeding product, the G+ Customer Profile gives the breeding program a clear picture of who will potentially be using the new variety – paying special attention to gender issues. It outlines the number of users, their geographic location, socio-economic characteristics, varietal preferences, and the reasons for these preferences," he explains.

Incorporating this gender dimension means that the traits that are important for women are both captured and reflected in the design of new products. Using the tool will help ensure that breeding programs explicitly address the needs and preferences of different segments of a target population.

In small working groups, participants discussed examples of G+ tool implementation, identifying what worked and what should be improved moving forward. In the customer profile session, groups developed case studies for virus resistant chickens in Tanzania, cassava for young women in Nigeria, potatoes in Kenya, and groundnut in India.

"We found that the tool is a great starting point to discuss in specific details who the 'customer' is, what their needs are and how many they are and how we are positioned to



Photo: H.Holmes/RTB

A young woman in Nigeria toasts Gari, a processed product made from cassava.

serve them. Having this conversation helps us to interrogate our intentions and plans more sharply," says Esther Njuguna-Mungai, gender specialist at ICRISAT.

"A key constraint that came up during

our discussions is the realization that programs don't always have enough information or data, that is available in the form and rigor required, to be a basis for decision making about the customers, at the time when the decisions need to be made. An evidence table could collate information on all the market segments, and more specific criteria developed for selecting target segments," adds Esther.

Another key point that arose during discussions was the need for a process involving structured conversations between breeders, gender and marketing specialists to arrive at the final customer segmentation and prioritization for breeding. During the workshop, participants prepared and discussed examples of G+ tool implementation.

Building on customer profiles, working groups had a first go at testing the product profile development tool for sorghum in West Africa based on prior detailed gender work by Eva Weltzein, Honorary Associate, Agronomy Department, University of Wisconsin – Madison. A typical product profile is a set of targeted attributes which a new plant variety or animal breed is expected to meet in order to be released. Attributes are described as traits with a specific value, for example, grain yield of 11 tons per hectare or higher.

"The G+ Product Profile Development tool provides a way for breeding programs to inspect the gender dimension of these traits when they are included in a product profile to determine whether it has any implications for gender equity. It assesses whether a trait meets the minimal 'do no harm' standards and allows breeding programs to characterize the benefits of a trait for women users," explains Vivian Polar, gender, monitoring and evaluation specialist with the CGIAR Research Program on Roots, Tubers and Bananas.

Blog by Holly Holmes and Clair Hershey

This article was originally posted at <http://www.rtb.cgiar.org/gender-breeding-initiative/news-and-opinions/tools-enabling-breeding-programs-gender-responsive/>

Multinational training workshop on analytical tools builds momentum on crop improvement

It is a really exciting time for crop improvement with new tools available and a modernization agenda. ICRISAT and other CGIAR institutions are moving crop improvement into the 21st century, Dr Peter S Carberry, Director General, ICRISAT, echoed the sentiments of over 40 researchers from 14 countries who participated in a workshop on the use of R and R-QTL.

R is a freely available statistical programming language used mainly to analyze data and develop statistical software. The five-day 2nd International Workshop on R & R-QTL was organized by the Statistics, Bio-Informatics & Data Management (SBDM) team at ICRISAT with support from CRP-GLDC, EiB Module 5 and CGIAR's Big Data Platform. The participants, mostly new users of R, said the workshop jump-started their learning.

"It is a statistical tool that can reveal how genes express themselves. The workshop helped me understand how data can be analyzed and how reports can be effectively explained," says groundnut breeder Dr Kalule Okello David of National Semi-Arid Resources Research Institute in Uganda.

Trainers from ICRISAT, University of California, Davis, and University of Wisconsin School of Medicine and Public Health showed participants how R can be used for analyzing large datasets and for other applications including QTL-mapping.

Rice breeder Dr P Revathi from ICAR- Indian Institute of Rice Research says learning R is essential for QTL-mapping, a statistical process that helps correlate observed plant traits with the genes responsible.

"It is better to do QTL-mapping with a widely used tool. The workshop has provided a good introduction and participants now can go back to try it on their datasets. Besides QTL-mapping, I also plan to use R for graphical representation of data," she says.

Chickpea genomic researcher Dr K R Soren of ICAR- Indian Institute of Pulses Research felt R's prowess in graphical data presentation is one of its big draws. He said the learnings from the workshop will also benefit his students.

Dr Abhishek Rathore, Theme Leader, SBDM, termed the workshop a capacity building exercise for crop scientists across disciplines.

"The workshop was divided into four modules, each aimed at making the training comprehensive. The participants were taught to design experiments for phenotype analysis, QTL-mapping and how research can be reproduced with R," he says.

The workshop also covered use of R to produce dynamic reports and for writing packages.

Three new UN resolutions focus on plant health, pulses and food safety

The United Nations General Assembly has declared two new 'International Days' and one 'Year' devoted to central issues in global food security and nutrition. With these it hopes to create a conversation and generate solutions to concerns about plant health, food safety and pulses.

2020 to be International Year of Plant Health

With up to 40% of global food crops lost annually due to plant pests, the importance of fostering healthy plants is crucial. Plant diseases and invasive insects cost the global economy around \$220 billion and around \$70 billion annually, respectively.

Ms Maria Helena Semedo, Deputy Director-General of the Food and Agriculture Organization (FAO), says, "The International Year of Plant Health is a key initiative to highlight the importance of plant health to enhance food security, protect the environment and biodiversity, and boost economic development."

FAO, along with the [International Plant Protection Convention Secretariat](#), will spearhead activities related to the International Year of Plant Health. An International Plant Health Conference will be among thousands of plant health events to be held around the world during the course of 2020.

ICRISAT researchers have been working to develop processes and technologies to promote and maintain plant health. Recently, [Microsoft awarded the AI for Earth grant to ICRISAT](#) for using artificial intelligence, cloud computing and other methods to improve models for pest forecasting and prediction and farm advisory services to support sustainable agriculture in developing parts of the world. [Simple, easy-to-use equipment to detect plant diseases](#) have the potential to save hard-earned crops of smallholder farmers.

Furthermore, the fight against the dreaded Fall Armyworm has also seen serious efforts from ICRISAT plant pathologists. Besides, for decades, the Germplasm Health Units at ICRISAT have been playing a substantial role in carrying out [safe, pest-free exchange of plant genetic resources \(PGR\)](#).

World Pulses Day on 10 February

After the year [2016 as the International Year of Pulses](#), the positive momentum surrounding pulses – protein-rich,



Identification of dry root rot in chickpea using Loop-Mediated Isothermal Amplification Method (LAMP). Photo: ICRISAT

nitrogen-fixing legumes – will continue, with the UN declaring 10 February as World Pulses Day.

Growing pulses contributes to sustainable crop production and creating a viable market for them is essential to promote cultivation among smallholder farmers. For knowledge sharing regarding cultivation, processing and marketing of pulses, ICRISAT has conducted several [training sessions for researchers and extension workers in India and other countries](#). Experts from the institution have also periodically [given inputs to policy makers](#) on sustainable approaches to achieve self-sufficiency in pulses.

World Food Safety Day on 7 June

An increasingly important issue in interconnected food systems, food safety gets highlighted by the UN resolution recognizing that "there is no food security without food safety".

ICRISAT has focused on finding multipronged solutions for certain food safety concerns such as aflatoxin, which threatens about five billion people. From disseminating [good agricultural practices to prevent aflatoxin contamination](#) to developing new, [aflatoxin-resistant groundnut varieties](#), ICRISAT researchers are at the forefront to combat threats to food safety.

Adapted from <http://www.fao.org/news/story/en/item/1175295/icode/>