Africa’s first biofortified pearl millet variety aims to combat anaemia

For millions of women and children in Africa, anaemia is a significant public health concern—and diets deficient in iron are often to blame. But consuming a new variety of pearl millet called chakti—with an additional 20% of the estimated average requirement of iron—may improve their nutritional status and help them reach their physical and cognitive potential. This scientific breakthrough is thanks to plant breeders at the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) under the work of HarvestPlus.

Millet, a cereal crop, is consumed daily by millions of low-income families in Africa and Asia. This first biofortified pearl millet variety in Africa, is naturally higher in iron and zinc—two micronutrients essential in diets for good health and productivity. Chakti was officially released by the government of Niger earlier this year for commercial cultivation. Using the Economic Community of West African States (ECOWAS) seed harmonization laws, which facilitate farmer access to high-quality seed varieties, this variety will subsequently be recommended for cultivation across the region.

Pearl millet is the oldest millet, used largely in Africa south of the Sahara. As a Smart Food that is good for consumers, the planet and the farmer, its high temperature tolerance and low water requirements make it ideally suited for dryland cultivation and climate-smart. Often the major dietary energy source in the Sahel, it is also the cheapest source of dietary iron and zinc for the region.

“In partnership with (INRAN in Niger, ISRA in Senegal, SARI in Ghana, INERA in Burkina Faso, IER in Mali, and UDUS in Nigeria), we tested the improved pearl millet across six countries,” say Dr M Govindaraj and
Dr P Gangashetty, pearl millet breeders at ICRISAT. “In addition to the nutritional benefits for consumers, farmers also appreciate that chakti matures 40 days earlier and has a 30% greater yield than local varieties, as well as resistance to downy mildew disease.” While chakti already has over 65mg/kg iron content compared to popular farmer varieties with about 47mg/kg, breeding efforts continue to make it even more nutritious.

“We are working closely with ICRISAT and national partners to scale up biofortified iron pearl millet in Niger and other ECOWAS countries,” says Dr Wolfgang Pfeiffer, Director of Research and Development at HarvestPlus. “This will help improve nutrition in millions of households in sub-Saharan Africa, and most significantly, can enhance physical and mental performance of children as well as of women of reproductive age.”

“Chakti is a proven, sustainable, food-based solution to reducing the burden of iron deficiency,” says Dr Erick Boy, head of nutrition at HarvestPlus. “It has been proven that it can provide a significant amount of the iron needed daily by young children in India and non-pregnant women in Benin, resulting in profound positive impacts on livelihoods.”

This work contributes to UN Sustainable Development Goal

**Project:** Genetically enhanced pearl millet with high grain iron density for improved human nutrition in West Central Africa  
**Funder:** HarvestPlus  
**Partners:** Institut national de la recherche agronomique du Niger (INRAN), Institut Sénégalais de Recherches Agricoles (ISRA), Savanna Agricultural Research Institute (SARI), Institut de l’Environnement et de Recherches Agricoles (INERA), Institut d’Economie Rurale (IER), Usmanu Danfodiyo University, Sokoto (UDUS) and ICRISAT  
**CRPs:** Agriculture for Nutrition and Health; and Grain Legumes and Dryland Cereals
The Ministry of Tribal Affairs, Government of India, declared ICRISAT as a Centre of Excellence to support and strengthen active research in the field of tribal development. Dr Peter Carberry, Director General (Acting), ICRISAT and Dr Arvind Padhee, Director, Country Relations and Business Affairs, ICRISAT, formally received the certificate from the Union Minister of Tribal Affairs, Mr Jual Oram, in New Delhi in June.

ICRISAT has been working for the development of tribals in Telangana in partnership with stakeholders. With improved livelihood, employment opportunities and decreased dependence on middle-men, tribal farmers in Adilabad district moved from subsistence to commercial operations.

Pigeonpea and sorghum processing units were set up and self-employment opportunities provided for women and youth. Access to quality seed and enhanced knowledge on crop production practices helped tribal farmers increase yields.

Recognizing the need to improve nutrition of children, pregnant women and lactating mothers, the Agribusiness and Innovation Platform at ICRISAT has developed a Nutri-Food basket comprising nutrient-rich food products from locally available ingredients. Served through the anganwadi (early child care) centers in Telangana, it aims to improve dietary diversity. It is now being scaled up to areas under the Integrated Tribal Development Agency in Telangana with the support of the Tribal Welfare Department, Government of Telangana.

Skill development in agriculture and allied sectors through exposure visits and study tours is one of the approaches adopted by ICRISAT to enhance the knowledge of tribal communities and integrate the learning into their daily farming activities. With support provided by the Telangana State Schedule Tribes Co-operative Finance Corporation Ltd., ICRISAT will enhance the capacities of 500 farmers by end of this year.

Dr Peter Carberry, reaffirmed ICRISAT’s commitment to smallholder farmers and most-at-need communities. “As a Centre of Excellence, ICRISAT will continue to work closely with tribal families in the country with focus on health and nutrition and enhancing micro-entrepreneurial opportunities thus building sustainable livelihoods.”
Awareness to adapt: Malian farmers prepare for climate change

Farmers in Mali are now better equipped to fight the challenges of climate change, thanks to training sessions on climate-smart agricultural practices. Over 1,300 farmers and extension workers in Mali participated in a series of trainings earlier this year, in sessions that included practical demonstrations. They in turn, would then propagate this knowledge across the region to over 31,000 farmers, through the creation of 90 sustainable climate-friendly businesses and savings groups focusing on the market. This initiative was part of the project BRACED-X Waati Yèlèma Labenw, the ultimate aim of which is to increase incomes, savings and access to finance for smallholder farmers.

Smallholder farmers in the dryland regions of Africa are one of the most vulnerable populations with regard to climate change and its impacts. Extreme weather events, reduced and unpredictable rainfall, and increasing temperatures all add to the preexisting challenges of degraded land, poverty, hunger and violence. In these circumstances, national and non-governmental organizations are working to equip the rural population with means to absorb the climate-related impacts, adapt to them and sustainably manage their livelihoods.

According to the 2017 AdaptationWatch Report, capacity building of farmers, extension workers and other key stakeholders through training is critical for national resilience to climate change. The capacity-building measures need to be self-sustaining and designed for the long term; this requires grassroots-level involvement of key stakeholders such as farmers. Forming working partnerships, groups and sharing experiences are also important ways to ensure uptake and continuance of the mitigation methods.

With these pointers in mind, the Waati Yélèma Labenw project enlisted farmers, municipality counselors and other extension workers to participate in capacity-building exercises spread over three months. After an initial session on Climate-Smart Agriculture (CSA) technologies, six training sessions were organized in different rural districts for 150 farmers; they would in turn train 1,200 farmers from the 30 project villages. For both training sessions, modules on CSA were provided by ICRISAT and the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS), especially on climate information. Courses were imparted through PowerPoint presentations and/or video and practical exercises.

CSA techniques specifically discussed were Zai pits (shallow ridged pits dug around plants to trap rainwater) and demi lunes (half-moon) (semi-circular pits with contour bunds to prevent rainwater runoff) techniques aimed at recovering degraded land and restoring poor soil fertility; preparation of organic compost using crop residues; optimum application of biofertilizers using microdosing method; intercropping cereals with legumes (cowpea, groundnut); alley cropping and integrated Striga management.

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. In Koulikoro, Segou and Mopti regions, a total of 1,171 farmers were trained at the end of this exercise.

According to an FAO report released in 2017, the following factors form the main framework of climate-smart agriculture i) Awareness ii) Techniques iii) Finance and iv) Policy.

Awareness about climate change among the smallholder farmers and techniques for adaptation were covered in the training sessions. Creation and execution of such campaigns needs government and stakeholder support on the ground. As the re-greening of the Sahel region in Africa demonstrates, with over five million hectares of dryland being converted to farmland, innovation-led ground-level campaigns that run with local support from the farmers can have greatly successful results.

Farmers in Mali, too, are counting on changing their own livelihoods with the help of the Waati Yèlèma Labenw project. Under this project, new community assets such as watershed protection, flood control and groundwater recharge dikes are also planned in the future in 30 new target villages.

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**Project:** Waati Yelema Labenw – under the Building Resiliency and Adaptation to Climate Extremes and Disasters (BRACED-X) program

**Funder:** UK aid through Blumont International

**CRP:** Water, Land and Ecosystems (WLE)

**Partners:** Amassa Afrique Verte and ICRISAT

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This work contributed to UN Sustainable Development Goal 13: Climate Action
Over 6,000 farmers to benefit from agribusiness initiatives in Andhra Pradesh, India

Over 6,000 farmers in Andhra Pradesh will move to an improved business model for better value chains and better incomes through an intensive two-year project supported by the Walmart Foundation in partnership with ICRISAT.

At a meeting in New Delhi on June 27, senior representatives from Walmart and ICRISAT launched ICRISAT’s program focussed on two key national priorities: doubling farmers’ incomes and addressing malnutrition in rural areas. Over the next two years, ICRISAT will work in Anantapur district in Andhra Pradesh state with 6,100 smallholder farmers, 2,000 of whom are women. The project will set up community-based millet and legume processing facilities, provide access to training and more productive plant varieties and educate buyers in the market about the nutritional value of grain legumes to help boost demand.

Anantapur is a dryland region where the adversities of climate change are felt by many farmers. Sorghum, millet, and legumes, especially groundnut, are cultivated in this region. Currently, traditional varieties are being used and farmers are looking to adopt new cultivation practices and cropping technologies. Walmart Foundation has granted close to US$2 million to the project as part of an ongoing initiative to improve market access for India’s smallholder farmers.

ICRISAT has been working in over 17 countries across the semi-arid tropics of Asia and sub-Saharan Africa for over 45 years. A key component of its Walmart Foundation-funded project is the establishment of networks of small enterprise centers where smallholder-produced grain legumes can be collected and jointly processed. These centers will be run by farmer organizations and, youth and women entrepreneurs, with appropriate training and support.

”Many of the 6 million farmers in Andhra Pradesh have very limited access to formal markets. We believe sustainable development in farming communities can be accelerated through direct skills building and growth of entrepreneurship, which creates new opportunities for farming communities across Andhra Pradesh.”

Ms Julie Gehrki
Vice President of Philanthropy,
Walmart Foundation

Dr Peter Carberry, Director General (Acting), ICRISAT, said: “Supporting smallholder farmers to better harness markets is a powerful way to help communities move from poverty to prosperity. ICRISAT’s Inclusive Market Oriented Development has supported millions of farmers across India towards better livelihoods. The support of Walmart Foundation is a great opportunity to further enhance the lives of smallholder farmers in Andhra Pradesh to build a better future.”

Paul Dyck, Walmart Vice President of Global Public Policy and Government Affairs, said: “Walmart has a long-term commitment to India that is based on supporting domestic businesses and empowering local communities. We believe that helping India’s small farmers unlock their potential is one of the most effective ways for us to do this, with a ripple effect that will bring positive benefits for generations to come.”

For more on media coverage of this article click here
In May 2009, farmers in the state of Karnataka were facing declining crop yields and stagnating agricultural production. It was at this time that ICRISAT, working with the Government of Karnataka, conceived, developed and implemented a project called **Bhoochetana (Revival of the Soil)**. Starting with six districts and 200,000 farmers, the project reached over 26,000 villages and 4.2 million farmers over the next nine years. With the use of science-backed innovations, millions of farmers experienced 20-66% higher crop yields and obtained a net benefit of US$ 453 million.

Bhoochetana was a mission to increase crop **productivity**, enhance farmers’ **incomes** and improve **nutrition** and livelihoods in the target regions. It was extraordinary in that it was **successfully scaled up** to include all the districts in Karnataka and also to other states in India.

To capture a snapshot of the evolution of this project, the **Bhoochetana Timeline** has been launched; it details the major milestones and impacts of this project. Bhoochetana’s initial phase was focused on building farmer awareness on soil nutrient status and soil mapping; daily monitoring of seasonal rainfall; and crop planning. Slowly, other interventions such as soil and water management; seeds/inputs management; supplying of farmer-preferred improved varieties; crop diversification; integrated pest management; and development/dissemination of agricultural machinery were also employed.

ICRISAT scientists applied the ‘Four Cs Approach’ to the project: Consortium, Convergence, Collective action and Capacity building. Other organizations came together to deliver knowledge solutions, technological inputs and a holistic program where multiple government projects could work together to synergize their capacities. Select farmers were trained as ‘facilitators’ so that they could support other farmers in their villages. Awareness programs, farmers’ field days and training sessions to familiarize farmers with technology, machinery and techniques were conducted. Mobile phones, videos, social media groups and voice messages were all used to create and disseminate farming-related information to remote villages.

The cooperative model of working with farmers and government organizations, with the use of technology for knowledge sharing was very successful and subsequent seasons showed double-digit increases in crop yields for various crops. As part of Phase-I of Bhoochetana, about 3.1 million farmers and 7.4 million ha in rainfed regions had been covered by 2012-13. Based on this success, the Government of Karnataka extended the initiative to cover irrigated crops in the state in Phase II of the project.

Apart from the Karnataka State Department of Agriculture, other major partners in this project were the State Agricultural Universities at Bengaluru, Raichur and Dharwad, which provided technical and logistical support.

Bhoochetana, an example of successful scale-up, is now extended to three more states (Undivided Andhra Pradesh, Andhra Pradesh and Odisha) in India, in partnership with the respective state governments.
Farmers in Mali got as much as 60% increased sorghum and pearl millet yield as a result of four years of intensive work. This was achieved through the Africa RISING project on sorghum and millet technologies. The big question was could the impact be sustained after the project completed its five-year cycle? In many development projects there is no assurance that impact will continue when project funding ends. However, here, the exit plan included mechanisms and a strategy to capacitate partners to take the lead after the project completion in 2019. To do this, work has begun on setting up Innovation Platforms. These platforms allow different actors to identify solutions to common problems and to achieve common goals.

The project – Africa RISING’s large-scale Diffusion of Technologies for Sorghum and Millet Systems (ARDT-SMS) – was initiated in partnership with the Institute of Rural Economy (IER). It focused on large-scale dissemination of sorghum and millet technologies in Mali, to enhance production, productivity and profitability. A consortium of multi-stakeholder institutions came together to strengthen the sorghum and millet value chain to create increased demand for improved agricultural technologies.

**Project impacts:**

(Results from an economic analysis on microdosing completed in 2017 in Mopti and Sikasso regions in Mali, involving 244 pearl millet and sorghum farmers).

**60% higher grain yields** were recorded from the application of Integrated Striga and Soil Fertility Management (ISSFM) strategy when compared to farmer practice.

Benefits generated by the application of microdosing treatments are largely higher than farmer practice for both sorghum and pearl millet production.

An analysis of farmers’ perceptions showed that about 98% of the sorghum and pearl millet farmers who participated in the project activities were satisfied with the technologies promoted by the project, with reasons including increased grain yield (91.21%), increase in marketable surplus (45.19%) and adaptation to drought (42.26%).

After four years of implementation, Innovation Platforms (IP) were set up to ensure that project impact continued. This would mean access to inputs, including improved seeds, pesticides and fertilizers, through links with private sector suppliers and links to sorghum and millet marketing initiatives to finance access.

At the training program held in April, partners had an opportunity to gain in-depth knowledge on how to initiate, facilitate, monitor and evaluate an IP to ensure sustainability.

Mr Souleymane Traore of Compagnie Malienne pour le Développement du Textile (CMDT), the Malian textile development company, said that CMDT will use the IPs to link sorghum producers and seed producers. They would raise awareness among farmers on importance of IPs, identify problems related to sorghum productivity as well as create an entry point for seed producers and suppliers of agricultural inputs. Dr Seriba Ousmane Katile, researcher

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<th>Benefit for sorghum</th>
<th>Income/ha</th>
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<tr>
<td>Application of ISSFM with microdosing</td>
<td>FCFA 135,425 (US$ 241)</td>
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<td>of 2g at sowing stage</td>
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<td>Microdosing of 2g at the first weeding</td>
<td>FCFA 11,315 (US$ 21)</td>
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<td>Mixture of fertilizers and seed (1/1)</td>
<td>FCFA 117,147 (US$ 209)</td>
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<td>Farmer practice</td>
<td>FCFA 68,525 (US$ 122)</td>
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<th>Benefit for pearl millet</th>
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<td>Mixture of fertilizers and seed (1/1)</td>
<td>FCFA 117,485 (US$ 209)</td>
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<td>Microdosing of 2g at sowing stage</td>
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<td>Microdosing of 2g at the first weeding</td>
<td>CFA 94,225 (US$ 168)</td>
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at IER, suggested a ‘training of trainers’ program to initiate and facilitate IPs that continue to better farmers’ access to improved millet and sorghum technologies.

During the training, participants developed individual work plans towards the creation and implementation of IPs in their respective communities.

The training was organized from 25-27 April by ICRISAT for 28 participants representing the project partners. ICRAF staff Dr Ann Degrande, socio-economist based in Yaoundé, Cameroon, and Dr Djalal Ademonla Arinloye, marketing specialist based at Bamako, Mali led the sessions. Dr John Nzungize, project coordinator, was the overseer.

This work contributes to UN Sustainable Development Goal

Project: Africa RISING’s large-scale Diffusion of Technologies for Sorghum and Millet Systems (ARDT-SMS)

Funder: USAID-Mali (Window 3)

Partners: Compagnie Malienne pour le Développement du Textile (CMDT), Catholic Relief Services (CRS), Mali Agricultural Market Trust (MALIMARK), European Cooperative for Rural Development (EUCORD), Association des Organisations Professionnelles Paysannes (AOPP), Institut d’Economie Rurale (IER), Aga Khan Foundation (AKF), my Agro, World Vision (WV) and ICRISAT.

CRP: Dryland Cereals (till 2016); CRP-Grain Legumes and Dryland Cereals (from 2018)

Workshop participants at Sikasso, Mali.
In Sidam Tulsiram’s village in Telangana state, India, no festivity or ritual is complete without the traditionally revered jowar (sorghum) grains. Whether it is a wedding, a groundbreaking or the sowing of the first crop of the year in the field, the lustrous white seeds of jowar are filled in a pot, and taken to the village temple and prayers are offered to the Goddess for blessings. This is true for most households in this region.

Persa Jonna (rainy season sorghum) and Sewta Jonna (post-rainy sorghum) play a significant role in the lives of farmers of this area. The grains are much more than just food; they are part of the people’s heritage, their beliefs and their way of life. And yet, today these grains are on the verge of disappearing.

Tulsiram, a garrulous, jolly farmer, is head of the Pataguda village in Adilabad District, who even at the age of 60 plus years, likes to work the land himself. Like many farmers of the dryland regions of the world (such as Adilabad), he too wages a daily battle against climate change in the form of increasingly higher temperatures, scant and irregular rainfall and degraded soils. The plight of farmers less prosperous, holding lesser land is even worse.

In order to help the struggling farmers adapt to the changing climate, agricultural scientists around the world have been striving to develop better crops with higher yields that can grow with less water and fewer inputs such as fertilizers.

After decades of growing Persa Jonna and Sewta as per tradition, around mid-1970s, farmers in this region were introduced to high-yielding hybrid seeds. Driven by the promise of more bountiful harvests in a shorter time with lesser water than the traditional varieties, farmers were happy to adopt the new seeds.

However, with an increasing number of farmers adopting the high-yielding hybrids, over the next four decades the native landrace (traditionally-grown local crop) Persa Jonna all but disappeared. Knowledge about the crop, its specific traits, nutritive properties etc., are also slowly vanishing, along with the older generation of farmers.

Culturally, this has left a void in the lives of the simple farmers. For them, the indigenous landrace was a vital part of their celebrations, their customs and their diets. Today, the farmers of this region are conflicted – torn between the need for good returns from their fields and the wish to preserve their cultural heritage.

This phenomenon is not restricted to Telangana in India. Across the globe, smallholder farmers are facing the dilemma of choosing between improving their financial status and losing their indigenous agricultural diversity. Researchers and development scientists worldwide are figuring out ways to solve this problem.

Dr Jana Kholova, Crop Physiologist, ICRISAT, and Mr Kumra Vittal Rao, Development of Humane Action (DHAN) Foundation, recently met farmers from villages around...
Pataguda to get a sense of what the farmers want. The most common comments that were heard were related to how 
Persh Jonna tastes better and is better suited to the local area and climate. The panicles of this sorghum variety has a ‘drooping’ tendency, which is an effective defense mechanism against birds.

Farmer participatory varietal selection has shown successful results in many countries. In this method, farmers have a say in the variety they want to select based on their needs and priorities such as better taste, more lustrous seeds, drooping panicle, etc., along with high yields. Adoption of newer varieties is higher when farmers have a higher participatory role to play in the selection of the varieties.

Dr Kholova and Mr Rao hope to include more farmers from Adilabad in the process of selecting suitable varieties of sorghum for growing in their fields, so that the farmers can specify and choose the traits that are most relevant to them. This inclusive and interactive process is expected to increase adoption of improved varieties of sorghum in this remote region, which has not seen much improvement in sorghum production in the past few decades. This will help them to build resilience against climate change without having to completely sacrifice their way of life.

The World Economic Forum, in its Global Risks Report in early 2018, has listed global agricultural and tree biodiversity as a key factor in combating the top five environmental risks facing the world today. Therefore there’s a need to be aware of the need to preserve heritage crop seeds along with developing improved varieties for enhancing yields and improving farmers’ incomes.

About the author:
Rajani Kumar is Communications Officer, Strategic Marketing & Communication, ICRISAT.
Defining India’s Agtech buzz

Use of digital technology for creating hyperlocal solutions and value-added services for agriculture is no longer just a blip on the radar of startups. It is an area that is fast gaining traction with tech companies, digital entrepreneurs and startups investing money and lining up some of their brightest minds toward expanding their footprints.

The Digital India Campaign — launched four years ago when the current government took power and initiated flagship announcements for making India a leading digital economy — has spawned a number of digital startups in a wide range of sectors, including what is called #agtech.

Use of technology in India’s agriculture sector has been an integral part of its story of food self-sufficiency and green revolution. The state-run satellite imagery, weather forecasts, soil and crop advisories and agriculture extension using state television and audio broadcast were some of the highlights of science and technology-driven agricultural policy for several decades.

So, it is only logical to ask what is different about the current buzz around digital agriculture.

Customization and localization
The current phase is driven by customization of solutions: aggregation of data and information, product development and market linkages. Though the solutions developed are in most cases built around focused needs, with limited tweaking and aggregation they can be replicated and quickly scaled-up. The unit of design or user could be just one farmer, but an entire community is catered to through the proliferation of solutions. With each successive pilot and test, the platforms get more responsive to context and the customizations needed to make them successful for the farmers.

Communication for adoption
Another aspect of the emerging digital agriculture landscape is the use of communication and behavior change marketing framework. Since the early days of science-based agricultural policy making, the challenge of empowering farmers to understand and use these services has been a formidable one. Today an increasing number of digital agriculture solutions are being built around the idea of user engagement. The use of application and platforms and feeding information are driven by direct interface with farmers or communities. This makes it essential that there are elements of training and capacity building through learning by use and peer-to-peer engagement.

Mobile devices and accessible platforms
In the current phase, the digital tools and applications or simply the products being developed are far more accessible in terms of technology, content format and user experience. An explosion of mobile usage has been the gamechanger for solution providers and the end users. You just have to picture the early days of farmers huddled around radios, or much later televisions, beaming state-run agriculture advisory or information packages. It was a crucial service but it was restrictive in terms of individual customization. It lacked interactivity and real-time solutions. It is a whole different ball game now, and that is a fundamental part of the digital agriculture revolution in the making.

Convergence of stakeholders: public and private
It is all very exciting for entrepreneurs, companies, tech evangelists and civil society organizations. But what does it mean for a smallholder farmer?

For the start-ups and investors, the small-holder farmer eventually is a buyer who sees economic gains or value in using the services and products being offered. Being a small-holder farmer in India today is fraught with difficulties and tremendous odds ranging from crop failures to extreme weather. India ranks tragically high on distress suicide by farmers.

For digital agriculture solutions to become scalable and profitable for smallholder farmers in India, there is a need to follow a multi-stakeholder framework with a robust ecosystem approach that is not just driven by tech but augmented by awareness, user journey support, massive state investment and convergence of schemes, especially doubling the farmers’ income initiative.

A standalone approach will not be enough, and a realization around this is apparent in the ongoing discussions around scale and profitability. The ecosystem approach would need to go beyond the regular user and product development linkage and look at community involvement and market linkage. The private sector cannot be expected to invest beyond a point in aspects like awareness, piloting, capacity building and research. The state and corporate social responsibility sector will have to approach some of the enabling aspects with a social lens while companies and entrepreneurs work on leveraging the business aspects.

The original post first appeared in AGRILINKS.

About the author:
Parvinder Singh is Senior Communications Manager, Strategic Marketing & Communication at ICRISAT.
Launch of four-year India-UK Partnering Award

A workshop on “Plant Sciences for Food Security and Nutrition” was held in UK to mark the formal commencement of a four-year India-UK Partnering Award by Biotechnology and Biological Sciences Research Council (BBRC). The Partnering Award will facilitate exchange of researchers from University of Leeds to ICRISAT and vice versa.

The workshop was organized by Prof. Alison Baker from the University of Leeds, UK and Dr Rajeev Varshney, Research Program Director, Genetic Gains, ICRISAT, and is a follow-up of the University of Leeds delegation’s visit to ICRISAT in 2017. It was attended by more than 60 delegates including senior and junior members of the Centre for Plant Sciences (CPS), University of Leeds and ICRISAT, as well as Dr Nigel Poole, former Chair of the ICRISAT Governing Board.

The workshop provided participants a platform to meet a wider cross section of people and understand more about current research in these two institutions. The workshop had sessions on –

- The semi-arid tropics, challenges and solutions;
- Underpinning sciences for ICRISAT mandate crops;
- Seeds; and
- Plants, environment and systems.

The delegation from ICRISAT made several presentations on topical subjects of common interest with CPS, University of Leeds and research scholars shared their current research work through poster presentations. The workshop was held from 13-14 June.

Read more about the BBRC India partnering award, awarded to Professor Alison Baker in collaboration with Professor Rajeev Varshney

ACIAR CEO meets ICRISAT leadership

(L to R) Visitors from the Australian Centre for International Agricultural Research – Prof. Andrew Campbell, CEO, and Ms Pratibha Singh, Regional Manager-South Asia, in a meeting with ICRISAT top management Dr Peter Carberry, Director General (Acting), and Dr Kiran K Sharma, Deputy Director General-Research (Acting).
Public-Private Partnership in agriculture to improve food security and farmer livelihoods

The significance of public-private partnership in increasing agricultural productivity and doubling farmers’ income was emphasized at a round table meeting of key stakeholders held at ICRISAT.

“An important mechanism to harness scientific expertise, skills, resources and technological innovations in the agricultural production system, emphasis needs to be put on Public Private Partnership (PPP) for both upstream and downstream directions of the agriculture value chain,” said Dr CD Mayee, President, South Asia Biotechnology Centre (SABC).

Dr Peter Carberry, Director General (Acting), ICRISAT, referred to PPP as ‘a real area of opportunity’, to help, “achieve twin goals of farmers’ profitability and agricultural sustainability with collaboration – from companies to communities – to improve input efficiency and crop productivity”.

Indian industry representative Dr Paresh Verma appealed to the Indian Government to draft a conducive policy framework for a regulatory environment for agriculture research, technology and innovation.

Dr Sanjeev Jha from the Indian Council of Agricultural Research (ICAR) proposed an institutional mechanism, guidelines and a clear national policy statement on PPP in agriculture for an attractive environment, collaborative R&D and extension.

The meeting was organized at ICRISAT on 11 June 2018, in partnership with SABC and Bayer Crop Sciences. About 50 stakeholders – farmers, members of farmer organizations, NGOs, ICAR institutes, state agricultural universities, industry associations, and the private sector – attended the meeting.
ICRISAT Kenya nutrition team participated last week in an agricultural show in Makueni county that provided a platform to engage with the community and sensitize them on the importance of dryland cereals and legumes.

Spreading nutrition awareness

Participants learn how to transfer data collected in the field into the Breeding Management System (BMS) at a training workshop organized by Tropical Legumes (TL) III and Harnessing Opportunities for Productivity Enhancement (HOPE II) at ICRISAT, Bamako, Mali.

BMS training in Mali
In the media

**Empowering Kenyan Women with Nutrition Education**
The Smart Food initiative is working to empower rural Kenyan women, families, and communities through participatory cooking classes, nutrition training, and door-to-door educational outreach. [Read more...]

**Orphan no more: Genomic boost to chickpea yield, climate resilience**
Now, the chickpea (*Cicer arietinum*) has got its own genetic atlas following a five-year long effort by researchers from International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Hyderabad, India. [Read more...]

**How new technologies can raise farm productivity**
“Collaboration between ICRISAT (International Crops Research Institute for the Semi-Arid Tropics) and Microsoft cloud technologies shows, on a pilot scale, how precision agriculture uses state-of-the-art technologies to avoid wasting water and other inputs (Wani et al. 2016).”

**Walmart offers a $2 million seed for AP farmers**
“Walmart Foundation, in alliance with the International Crops Research Institute for the Semi-Arid Tropic (ICRISAT), has announced an investment of close to $2 million to help farmers in Andhra Pradesh move to an improved business model for better value chains and income.”

**GOVERNANCE now**

**‘Smart food of 21st century’ for the children**
Millet is good for farmers, for nature and for us. These nutrition-rich food grains should be made part of the mid-day meal scheme. [Read more...]

**SeedQuest**

**Africa’s first biofortified pearl millet variety aims to combat anaemia**
For millions of women and children in Africa anaemia is a significant public health concern—and diets deficient in iron are often to blame. But consuming a new variety of pearl millet called chakti—with an additional 20% of the estimated average requirement of iron—may improve their nutritional status and help them reach their physical and cognitive potential. [Read more...]

**5 Ways AI Is Building A Better, Brighter Future For Asia**
“In India, Microsoft has partnered with a non-profit organization, International Crop Research Institute for the Semi-Arid Tropics (ICRISAT), to develop an AI Sowing App that sends advisories to farmers on the optimal date to sow their crops, based on weather conditions, soil, and other indicators.”

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**Du millet enrichi au fer peut aider à combattre l’anémie**
“Selon l’Institut international de recherche sur les cultures des zones tropicales semi-arides (ICRISAT - International Crops Research Institute for the Semi-Arid Tropics), une nouvelle variété de millet perlé appelé Chakti peut préserver ses consommateurs de l’anémie, tout en les aidant à améliorer leur état nutritionnel et leur potentiel physique et cognitif.”
How India is carving out a niche for itself in the field of Artificial Intelligence

"Microsoft and the International Crops Research Institute for the Semi-Arid Tropics have together developed a sowing app that uses AI technologies. It sends advisories to participating farmers on the optimal date of sowing."

New paddy variety bursts onto East Godavari Agency scene

"DRR Dhan 44, developed by the Indian Institute of Rice Research (IIRR), has fared better than MTU 1001, a common variety in this area. In addition to yielding four bags more than other varieties, Dhan 44 has withstood well the long dry spells. ICRISAT is giving 50% input subsidy to identified farmers...

This project has been taken up under Rythu Kosam in Andhra Pradesh (AP Primary Sector Mission) and trials were conducted by ICRISAT under the guidance of the International Rice Research Institute (IRRI) located on its campus in Hyderabad with the help of the Andhra Pradesh Agriculture Department, the IIRR, and ASDS, an NGO."
ICRISAT in GoI discussion papers

Page 33 of the Government of India’s (GoI) Niti Aayog Discussion Paper ‘National Strategy for Artificial Intelligence # AIforall’ carries a box on ICRISAT’s work.

"Microsoft in collaboration with ICRISAT, developed an AI Sowing App powered by Microsoft Cortana Intelligence Suite including Machine Learning and Power BI. The app sends sowing advisories to participating farmers on the optimal date to sow. The best part – the farmers don’t need to install any sensors in their fields or incur any capital expenditure. All they needed was a feature phone capable of receiving text messages. The advisories contained essential information including the optimal sowing date, soil test based fertilizer application, farm yard manure application, seed treatment, optimum sowing depth, and more. In tandem with the app, a personalised village advisory dashboard provided important insights into soil health, recommended fertilizer, and seven-day weather forecasts..."

ICRISAT bids farewell to Dr Suhas Wani

Outgoing Research Program Director-Asia and Theme Leader - ICRISAT Development Center, Dr Suhas P Wani, was felicitated at a farewell event organized on 29 June.

During his 36 years of service to ICRISAT, Dr Wani has had significant impact as a scientist. He has over 586 peer reviewed publications to his credit and has demonstrated successful translation of scientific work to the field. His unique approach and consortium and convergence model in watershed development, led to scale of operations. His strategic inputs impacted the Government of India policy and he has also spearheaded federal and institutional partnerships to reach millions of farmers in India. His contribution to roping in the corporate sector and industry to gain their confidence and partnership is also significant. He is considered a pioneer in watershed approaches in India and has been named as one of the global influencers on water.

The leadership and staff of ICRISAT extended their best wishes to Dr Wani on his retirement.

"Your tireless dedication and significant contributions to realising the mission of ICRISAT have been exemplary and impacted the lives of many. Suhas, speaking personally, I have learnt much from you and have been greatly impressed by the combination of the technical and practical approaches that you advocate to significantly improve livelihoods and meet the needs of rural communities. Truly impressive! Your legacy to ICRISAT will last a long time and is one you can be extremely proud of.

Thank you Suhas on behalf of all of ICRISAT, our partners, stakeholders and all the recipients of your knowledge and wisdom, it has been a great pleasure working with you. With my very best wishes to you and your family for the future.

Dr Nigel Kerby, Chair, ICRISAT Governing Board

"For close to four decades, Suhas has been an esteemed member of Team ICRISAT, a long-term leader in the Management Group and so he will be greatly missed by colleagues, students, partners and all. Suhas, as you retire from ICRISAT, we all thank you for being a distinguished leader and for making such a valuable contribution to ICRISAT’s mission with your knowledge, experience and support. We wish you well as you start the next chapter of your life.

Dr Peter Carberry, Director General (Acting)