UK Minister Lord Ahmad visits ICRISAT, discusses climate action

Lord Tariq Ahmad, Minister of State for South Asia and the Commonwealth in the UK Government’s Foreign, Commonwealth & Development Office (FCDO), led a high-level delegation to discuss climate-resilient agriculture, biodiversity and sustainability during his visit to ICRISAT, Hyderabad, on 18 March 2021.

ICRISAT helps smallholder farmers adapt to climate change and mitigate its devastating impacts on agriculture. Scientists from ICRISAT’s breeding and genomics facility demonstrated to Lord Ahmad how traits such as heat and drought tolerance are identified and used to accelerate development of climate-resilient crops, how water conservation technologies help smallholder farmers increase their yields even when monsoon rains are scanty, and how biodiversity of crops important for drylands is preserved in the ICRISAT Genebank.

“This year, as we host COP26 in Glasgow, sustainable agricultural practices and technologies are an important issue for the UK. My visit to ICRISAT today is to explore future collaboration in this regard and an opportunity to see how ICRISAT is catalyzing productivity and prosperity in the semi-arid tropics in the face of climate change,” said Lord Ahmad.

Lord Ahmad toured ICRISAT’s field experiments, water and biodiversity management facilities, genomics facilities and the genebank. At the genebank, the Minister witnessed the genetic diversity of dryland crops preserved at ICRISAT. More than 91% of the 128,691 accessions in the genebank have been duplicated at the Svalbard Global Seed Vault. ICRISAT’s mandate crops – millets, sorghum, groundnut, chickpea and pigeonpea – are highly nutritious, help smallholder farmers mitigate climate risks as they grow in harsh climates, poor soils and require less inputs. They are a good climate risk management strategy for farmers, a source of income and help assure food and nutrition security in the community.

Emphasizing water harvesting to enhance the ability of smallholder farmers to withstand climate shocks, researchers working on water conservation briefed the Minister about the positive impacts of scaling up
watershed and natural resources management. The impacts include significant improvements in crop yields and livelihoods in some of the harshest landscapes of Telangana, Karnataka, Uttar Pradesh and other parts of India.

In addition to studying the effects of rising temperature and reduced water availability, ICRISAT is researching the effects of rising levels of carbon dioxide – the main driver of global warming and in turn climate change – on crops. The Minister was briefed about the changes in the behavior of crops, pests and diseases that can occur with rising carbon dioxide levels.

“Climate change threatens to compromise food systems and disrupt lives. We are committed to making smallholder farming in the drylands resilient to climate shocks,” said Dr Jacqueline Hughes, Director General, ICRISAT. “Leading climate action from the front, the UK is hosting the Global Summit on Climate and Development later this month in the run-up to COP26 in Glasgow in November.”

Dr Pooja Bhatnagar, Theme Leader - Cell, Molecular Biology & Genetic Engineering, explains the use of new crop breeding techniques to Lord Ahmad.

Dr Vania Azevedo (far right), Head, ICRISAT Genebank, gives Lord Ahmad an overview of various groundnut varieties, as (L-R) Dr Jacqueline Hughes, Director General, ICRISAT; Mr Alex W Ellis, UK High Commissioner to India; and Dr Arvind Kumar, Deputy Director General - Research, ICRISAT look on.
Odisha government, ICRISAT ink new agriculture partnership for vulnerable tribal groups

Odisha Chief Minister Mr Naveen Patnaik announced the collaboration on 2 March 2021

The Government of Odisha is collaborating with ICRISAT to strengthen management of natural resources for the benefit of the state’s Particularly Vulnerable Tribal Groups that are dependent on agriculture. Accordingly, ICRISAT will undertake capacity building initiatives, water harvesting, recording of hydrological parameters and crop productivity, in addition to monitoring land use as well as land cover through remote sensing and GIS in 12 districts of Odisha.

“The main objective of this collaboration is promoting sustainable integrated natural resource management through capacity building and monitoring. The period of agreement is for three years and the area of intervention is spread over 12 districts,” said Mr PK Jena, Development Commissioner and Additional Chief Secretary, Government of Odisha, during signing of the partnership agreement in Bhubaneshwar on 2 March 2021.

The collaboration is a part of Odisha’s Particularly Vulnerable Tribal Groups Empowerment and Livelihoods Improvement Program (OPELIP), which is funded by the UN’s International Fund for Agricultural Development (IFAD). OPELIP aims to develop integrated approaches for improved access to natural resources, agriculture technologies and other services in the state’s 12 districts where populations of Particularly Vulnerable Tribal Groups (PVTG) reside. These districts are Sundargarh, Mayurbhanj, Debagarh, Kendujhar, Angul, Nuapada, Kandhamal, Kalahandi, Rayagada, Gajapati, Ganjam and Malkangiri.

“Our partnership with the Government of Odisha has steadily enhanced the living conditions for particularly vulnerable tribal groups. Together, we have helped improve agricultural practices and productivity as well as food and nutrition security. I am confident that this partnership with ICRISAT will help ensure that the lands and forests these communities rely on are managed sustainably, securing their livelihoods for generations to come,” said Mr Ulaç Demirag, Country Director, IFAD India.

The new collaboration will also see ICRISAT develop rainwater harvesting structures and setting up gauging stations to record rainfall, run-off and other hydrological parameters in four districts where Jhum or shifting cultivation is practiced.

“ICRISAT will use its expertise in hydrology and its strong capabilities in remote sensing and GIS techniques. In all of ICRISAT’s past and current partnerships, capacity development has been a vital component – across the farming community, government functionaries and NGO partners – as it is crucial for delivery of required outputs,” said Dr Jacqueline Hughes, Director General,
ICRISAT. “Assessment and monitoring are also critical to ensure achievement of objectives. ICRISAT will support the Government of Odisha’s efforts to ensure outputs and outcomes are delivered in a timely manner.”

Government of Odisha and ICRISAT have been partnering for a decade for the benefit of the state’s smallholder farmers and agriculture. The partnership is a holistic approach to enhance crop productivity, improve incomes and better nutritional outcomes by making agriculture climate resilient and sustainable.

Some of the collaborative efforts underway include development and promotion of improved varieties of pigeonpea, groundnut and chickpea; monitoring and improvement of soil health under the Bhoochetana Project that has already demonstrated yield increases in the range of 20-60% across the state; and supporting the Odisha Livelihood Mission in a multifaceted manner.

“We are very hopeful about the outcomes of the new initiative and are looking forward to it. We hope that this partnership will add to the socioeconomic development of particularly vulnerable tribal groups in Odisha. We would like to see if this can be replicated in other areas or micro-projects as well,” said Ms Ranjana Chopra, Principal Secretary, ST & SC Development, Minorities and Backward Classes Welfare Department, Government of Odisha.

Dr AB Ota, Special Secretary and Director ST & SC Research and Training Institute, Odisha; Mr P Arthanari, Project Director, OPELIP; and ICRISAT scientists Dr PK Mishra and Dr KH Anantha were present during the exchange of agreements. Dr Hughes; Dr Arvind Kumar, Deputy Director General-Research, ICRISAT; Dr Arabinda Padhee, Director, Country Relations, ICRISAT; Dr Pooran Gaur, Senior Consultant, ICRISAT and Dr Sreenath Dixit, Head, ICRISAT Development Center joined the MOA signing virtually.

Project: Providing capacity building support to restoring degraded landscapes for improving livelihood and nutritional security of the PVTG in Odisha

Funders: OPELIP, ST & SC Development Department, Government of Odisha, International Fund for Agricultural Development (IFAD)
Forging a new alliance to build sustainable agri models using soil science expertise

ICRISAT will use its decades of experience and expertise in soil health management to help Indian farmers grow higher-yielding crops for greater income benefits, according to a recently launched partnership with the Naandi Foundation. Among the objectives of this association are monitoring soil health and plant nutrient status; suggesting measures to improve soil; recommending crop management practices, setting standards for organic soil amendments; building capacity of farmers on use of technology in sampling and so on.

Naandi, a social sector organization working to eliminate poverty in India, is active in 17 Indian states and is working towards building sustainable social models that deliver critical services to underserved communities. Its economic model – Arakunomics – was one of the Rockefeller Foundation-sponsored ‘Top 10 Visionaries’ in the world for the Food Vision 2050 Prize for their dedicated work in Araku Valley Andhra Pradesh. This initiative helped gain profits for farmers and quality for consumers through regenerative agriculture in the last 20 years.

At the virtual launch of the project, Dr Pushpajeet Choudhari, Manager, Charles Renard Analytical Laboratory, ICRISAT, gave a brief overview of project interventions of ICRISAT Development Center (IDC) and highlighted the ICRISAT-NAANDI project’s objectives. The collaborative project will deal with soil health assessment, restoration of soil fertility, and crop quality analysis at the active project sites (Maharashtra, Araku Valley, Bengaluru and New Delhi) under the Naandi’s umbrella. Geo-referenced soil sampling, data management, and soil health monitoring will be conducted using an android application – MSoil – developed by the Digital Agriculture team at ICRISAT.

“Research trials will be conducted in Araku for studying the correlation between soil qualities of the coffee gardens and cupping scores of coffee,” said Dr David Hogg, Chief Agriculture Advisor, Naandi. Dr Rajesh Pasumarthi, IDC, gave his inputs on organic and microbiological analysis. The senior management team from Naandi, including Ms Rohini Mukherjee, Chief Policy Officer; Dr David Hogg, Mr Daljit Singh, Head of Operations, Wardha; and Mr Vikash Abraham, Head of Operations for Urban Farm Projects, virtually joined the meeting.

The launch of the partnered project took place on 9 March 2021. The project will run until 14 November 2025.

For more on our work on soil management, click here: http://exploreit.icrisat.org/profile/natural%20resource%20management/92

This work contributes to UN Sustainable Development Goals
New project bets on ‘seeing is believing’ to improve farm livelihoods and landscape management in Tanzania

**Project:** Enabling a Resilient and Prosperous Community through Participatory Agroecological Practices in the Semi-Arid Region of Central Tanzania

A new initiative aims to create learning sites that showcase proven agroecological practices, improve their adoption and institutionalize them in a participatory manner for the benefit of at least 6,000 vulnerable farm households. To raise agricultural productivity and, in turn, to improve food and nutritional security in Central Tanzania, research, academia and international development actors in the region recently launched a three-year collaboration.

The collaborative project will be implemented in the watershed close to the villages of Sagara, Mlali, Laikala, Nghumbi, Lengaji, and Moleți in Kongwa district of Tanzania’s Dodoma region.

Agriculture is an important contributor to Tanzania’s economy, accounting for 30% of the GDP, employing 80% of the country’s workforce while generating 85% of its annual export earnings. Despite its relevance, Tanzania’s agriculture sector faces many challenges that can be addressed through knowledge generation, sharing and innovation by way of research and development.

The project aims to address those challenges through an integrated watershed approach to manage landscapes. Accordingly, it seeks to bring communities together to plan and implement interventions such as contours and vegetation to manage runoff, and introduce new packages of crop and agronomic interventions to not only improve farms but to also improve landscapes. Such an approach is vital for holistic and sustainable improvement, and to make livelihoods resilient. The project is being funded by the Biovision Foundation for Ecological Development and Dr Birhanu Zemadim Birhanu, Senior Scientist, Land and Water Management, ICRISAT, is its Principal Investigator.

Speaking during the project launch meeting on 15 February, Dr Lameck Makoye, Center Manager, Tanzania Agricultural Research Institute (TARI)-Hombolo, and a representative of TARI’s Director General, said the project will build on the good work of the Africa RISING project that introduced Fanya Juu and Fanya Chini (a commonly used terrace structure to control erosion).

As a participatory adaptive research effort, the farming community is set to take the lead and it is hoped that the project will influence policy regarding the region by demonstrating scalable landscape-level innovations to policymakers and other development actors in addition to the larger farming community.

“Through the established learning sites, we hope other farming communities and policymakers see that landscape approaches are key to improving livelihoods and enhancing/safeguarding the natural resource base,” said Dr Anthony Whitbread, Director of the Innovation Systems for the Drylands (ISD) Research Program, ICRISAT and its Country Representative in Tanzania.

For more on our work in natural resource management, click here: [http://explore.icrisat.org/profile/natural%20resource%20management/92](http://explore.icrisat.org/profile/natural%20resource%20management/92)

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**Project:** Enabling a resilient and prosperous community through participatory agroecological practices in the semi-arid region of central Tanzania

**Partners:** Tanzanian Agricultural Research Institute (TARI), LEAD Foundation, Sokoine University of Agriculture (SUA), World Food Programme (WFP) and ICRISAT

**Funder:** Biovision Foundation for Ecological Development

**CGIAR Research Program:** Water, Land and Ecosystems

This work contributes to UN Sustainable Development Goals
Capacity building

Special training sessions initiated for young women and hearing-impaired youth in Ghana

*Investing in the most vulnerable is crucial for meeting the UN SDGs*

To unlock the potential of youth in agriculture, we need targeted, inclusive interventions that appeal to specific and diverse groups of youth, especially female and differently-abled youth. Towards this goal, customized training sessions for young women, and hearing-impaired youth from the Wa School for the Deaf were conducted in Ghana recently, focusing on behavior change communication that incentivizes choice of improved varieties and quality seeds of cereals and legumes. The sessions were tailored to address the sustainable development goals (SDGs) of zero poverty, zero hunger and gender equality.

The promise of expanding markets and increased demand for food products from a growing global population would suggest more incentives to engage in farming, making the sector attractive for the current and next generations. However, agriculture is facing unprecedented challenges. Possibly because of this, agriculture – particularly smallholder food production, widely believed to contribute to increased food production and rural poverty reduction – is less likely to draw in young people as a preferred choice of work.

Youth are commonly treated as an undifferentiated group with essential, static qualities and little agency. However, the youth are a differentiated group, with diverse experiences, ideas and aspirations. These aspirations are shaped by factors across local, regional and even global scales. While there are opportunities for youth, many of their needs, including agricultural ones, remain largely unmet, with more limitations for females due to local norms. Also, agribusiness, which is a vital sector for youth living in poverty across Africa, is one where differently-abled youth face some of the greatest prejudices and exclusion.

Therefore, opportunities should intentionally be planned with and extended to female and male youth groups of different social spectra. Enabling youth to tap into the available opportunity structures needs transformative approaches that include (i) targeting to ensure inclusive participation; (ii) customized interventions that equally benefit all types of youth groups; and (iii) providing a conducive social, economic and policy environment.

In Ghana, several youth with hearing impairment, such as those from the Wa School for the Deaf, found that...
they could not access information on improved crop production, which resulted in their reliance on traditional methods of crop production, as well as recycling of seeds for production. Under the AVISA project and others, led by ICRISAT in collaboration with CSIR-SARI and the CGIAR Research Program for Grain Legumes and Dryland Cereals, these youth were part of a training on groundnut seed production, marketing and processing in the Upper West Region of Ghana. The training was supported by Wa School and Antika Seed Company, a major seed company in the region.

The training focused on developing an organized group of groundnut producers to understand the market potential in groundnut seed production and marketing and as well developing sustainable market linkages for the commodities produced. Key areas of the training included groundnut seed production, quality control of seeds, seed business development, concept of the Village Savings and Loans Association (VSLA), group dynamics for sustainable grassroot organization among seed producers and processing of groundnut into confectionaries of high nutritional and market value. The training on group dynamics will also facilitate gender equality in the discharge of group activities, since group membership is made up of female and male young farmers with diverse religious and cultural backgrounds.

A total of 300 youth aged 15 to 35, out of which 30 were from the Wa School of the Deaf obtained the training. In a welcome address, Mr Sylvester Bayor, Headmaster of the school, appreciated ICRISAT for including this most vulnerable population in the project. He was emphatic the youth will embrace the learnings wholeheartedly since this is the first time they have had the opportunity to partake in a project activity of this nature.

After the training session, the participants were all smiles, realizing that they are now seen as equal members of the community with shared challenges but also similar opportunities to benefit from and be empowered to overcome their specific challenges. As active members of the farming community, their inclusion and participation in the groundnut value chain activities will boost their livelihood and productivity. This sense of belonging alone gave them a feeling of playing on a level field.

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This story also appears on the CRP-GLDC website here:
http://gldc.cgiar.org/targeting-and-investing-in-the-most-vulnerable-is-crucial-for-meeting-the-sdgs/

Authors:
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CSIR-SARI

For more on our work in Ghana, click here

Project: AVISA
Funder: Bill & Melinda Gates Foundation
Partners: CSIR-Savanna Agriculture Research Institute (SARI)
CGIAR Research Program: Grain Legumes and Dryland Cereals

This work contributes to UN Sustainable Development Goals
Creating a team of young scientists equipped with tech tools to fight pests and diseases

A recent workshop on pest and disease modeling for crops was conducted for young scientists from various parts of India, by the University of Agricultural Sciences, Bangalore, and ICRISAT. The program included training on use of novel methods, data science and machine learning tools to predict pest and disease outbreaks for their timely management.

Dr Prasanna Kumar, Coordinator of the training program, said, “Simulation models have been proven to be the most effective mathematical and statistical tools that can help to design management strategies for pests and diseases in plants.”

Dr Mamta Sharma, Theme Leader, Integrated Crop Management, ICRISAT, and Head of the Center of Excellence in Climate Change Research for Plant Protection, said, “Capacity-building activities for young researchers are among our major objectives. This way we equip them with the latest disease modeling tools to keep us all prepared for the future.” She said that the research at the Center of Excellence contributed strategic knowledge for the national program of climate change advisories for agriculture.

“Today the challenge is how early we can predict an incidence of pest or disease in real time. Any delay can result in significant damage for the farmer,” said Prof Rajendra Prasad, Vice Chancellor, UAS, Bangalore. He appreciated the fact that the trainees were from various parts of the country – Tamil Nadu, Telangana, Punjab etc.

Dr Arvind Kumar, Deputy Director General – Research, ICRISAT, recommended the training course to the young attendees, saying that it was a uniquely meaningful training course that combined different streams of research – from climate change, to plant diseases and then to disease/outbreak predictions based on modeling tools. He urged the participants to interact with each other, exchange information and think of practical applications of the learning.

Dr Akhilesh Gupta, Advisor and Head of Climate Change at the Department of Science and Technology, said, “We need to have academic institutions, that have rich human resources, and research institutions, that have strong R&D infrastructure, work together. That’s the way we can create competencies in these areas across the length and breadth of the country.”

“Significant crop losses occur due to pests and diseases worldwide,” said Dr Nagaraj, Head, Department of Plant Pathology, UAS, Bangalore. “Therefore, such training is essential to prepare the next generation of scientists to deal with future pest attacks and disease outbreaks which may only increase with a changing climate.”

As the training program had a good blend of attendees from several regions, it was a great opportunity for all to learn and also to exchange information. Participants were thankful to the training program for equipping them with next-generation modelling tools for pest and disease management.

This training program was supported by Climate Change Program, Department of Science and Technology, Govt of India; CGIAR Research Program on Grain Legumes and Dryland Cereals; ICAR-CAAST-NGT; the World Bank; and ICRISAT.

For more on our work on pests and diseases, click here.

This work contributes to UN Sustainable Development Goals
Gender parity cannot be achieved by putting the onus of it on one gender; joint efforts by everyone are needed to create a safe, equitable and nurturing working climate for all. Our female colleagues across levels and regions came together to exchange personal experiences and give inputs for solutions to some of the issues, on the occasion of International Women’s Day 2021.

In contrast to last year’s IWD celebrations at ICRISAT headquarters, this year it was a completely virtual event, for obvious reasons. However, there was no dearth of insights from women employees on the key areas of concern for every woman in the organization, and on how to deal with them.

Dr Jacqueline Hughes, Director General, began with a call for greater equity and fewer biases (conscious and unconscious) in the organization. “Even on farmers’ fields,” she said, “If we can empower the women farmers, we can hope to narrow the existing yield gap between men and women farmers.”

In a panel discussion on “From Challenge Comes Change and Opportunities”, women delved into the good and bad experiences during their career.

Dr Caroline Hambloc, Value Chain Specialist, Zimbabwe, underscored the issue of abuse at the workplace, asking that all women learn how to recognize even subtle forms of abuse and know how to get support to deal with it. She advocated speaking up against all forms of abuse, not just for oneself, but for others also.

Dr Jummai Yila, Gender Research Scientist, Mali, said that women often hesitated from asking for ‘privileges’ that men did not hesitate to ask for, as they were not sure if it was right under specific cultural context. Therefore, clear guidelines on the what rights all employees have would make things easier for women.

Ms Swati Jain, Head, Internal Audit, Hyderabad, asked that women’s contributions be measured by the outputs they delivered, not by the hours they spent in the workplace. She also felt that women needed to pay extra attention to their own health and not ignore their wellbeing while playing multiple roles of worker, caregiver etc.

Ms Joorie Bhattacharya, Research Scholar, Hyderabad, was of the opinion that responsibilities and merits were not dependent on gender; hence gender should never play a role in deciding responsibilities or roles. She related the positive impact that her mentors (male and female) had in shaping her research career so far.
Solutions to some of the issues mentioned were the sensitization of the entire workforce towards the challenges faced by women at all levels, and the creation of an environment where any wrongdoing could be fearlessly reported. The following ideas were also put forth by the panelists:

- Due credit to be given to researchers for their work, irrespective of gender or position.
- Greater awareness in the workforce about various policies that support women during adverse situations e.g. the Speak Up policy, which according to a survey, less than 20% of the staff were well-versed with.
- Everyone stands up to support any employee who is in trouble so that collective efforts bring resolutions more quickly.
- Narrowing of the pay gap and career gap between male and female employees, starting with undertaking an audit.
- Fostering a work culture of openness and empathy.
- Using gender-inclusive language, proactively ensuring women are mentioned, e.g. saying ‘women and men farmers’.

The panel discussion was moderated by Ms Joanna Kane-Potaka, Assistant Director General – External Relations and Executive Director, Smart Food.

It was clear that, as Dr Hughes said, “Our diversity is our strength. We should all strive to protect it so that we can reap the benefits of an equitable world.” International Women’s Day was observed on 8 March 2021.
The glaring inequality between men and women farmers in the African agricultural sector is alarming evidence that calls for fair, inclusive and sustainable development. Gender productivity gaps vary across and even within countries, but recent studies suggest that gender gaps are in the range of 10% to 30%.

Gender gap in agricultural productivity means that crop production is lower than its potential. Closing the gender gap in access to production capitals alone has been estimated to have the potential of lifting 100–150 million people out of hunger, thus resulting in benefits that spread far beyond female farmers.

Gender issues in agriculture including access to and control over resources continues to be the underlining factor widening the gap in production between male and female farmers in Africa. Much of the work women do as household providers and agricultural producers is unpaid, making their contribution essentially invisible. Women and female-headed households are disproportionately affected by economic recession and higher food prices and trade policies.

The crucial question becomes, how do women farmers involve in, equitably benefit from and contribute to agriculture development? We cannot overcome these challenges while age-old, ingrained ideas of gender roles deny women’s full participation in decision-making and social and economic development. The stage of intentions, promises and pious hopes should be over; we must now not only act but must all act targeted to challenge and combat gender inequality. Investing in women farmers significantly increases productivity, reduces hunger and nutrition, and improves rural livelihoods for both women and men, and the next generation, partly because women spend their money and their produce differently and save their income by investing in areas such as health, education, social assistance, and child nutrition.

The Persistence of Gender Inequality is the Reason why we should Challenge it

In order to understand why gender inequality, persist, we need to underscore what gender is. The word gender describes a social construct that ascribes roles, rules (norms), responsibilities, opportunities, power, behavior and what the society considers appropriate for men and women. Though fluid and context-specific, the construction of gender underlines the reason for the persistence of gender inequality experienced differently by men and women.

Gender norms (or rules) seem to influence what is appropriate to do in our society. Because of gender, girls and women often have lower social status, less access to resources that should naturally be given or used without applying the gender spectrum. These issues are at the core of the contemporary gender system, which systematically empowers one against the other, consequently producing a bidirectional relationship between gender inequality and development outcomes.

While more women farmers in Africa continue to engage in farming, look for and adopt high yielding nutritious and climate-resilient crop varieties, they face an array of constraints making full involvement in and contribution to agriculture difficult. One of such is the lack or poor involvement of women farmers in technology development and transfer processes.

“Before women were not interested in growing sorghum but with the arrival of grinkan (improved variety), we started growing for selling to meet our needs. Women
are becoming independent of men. The introduction of
new varieties brought a change in the relationship
between women and men because there are fewer
quarrels due to money problems” (by a female sorghum
producer in Sikkasou, Mali during FGD in 2019)

Customized interventions to target, reach and
empower women cereal-legume value chain actors.

Women have far less access than men to input, financial
services, land ownership, training and other means of
increasing agricultural production and improving family
income, nutrition and health. In West and Central Africa,
women live in patriarchal societies dominated by
stereotypes, and norms. Limited opportunities for
innovative technologies hamper rural women’s
livelihood prospects and personal development.
Through a recent study in three sorghum, pearl millet
and groundnut production regions in Mali, about 1000
women farmers, marketers, processors highlighted the
most significant constraints and challenges that limit
their agricultural productivity, among which access to
improved seeds, market linkages, fertilizers are major
constraints.

Gender-sensitive interventions that would create market
linkages and increase access to inputs are some of the
ways to ease the economic and social burden on
women, enable them to benefit from technological
development. This is why customized training on
behavior change and communication aimed to equip
and to build the capacity of women involved in cereals-
legumes value chains. Trainings focused on seed
production, post-harvest techniques, processing and
market linkages are the best way to reach, empower and
to alleviate the structural and functional constraints
faced by women. A total of 208 women from millet,
sorghum and groundnut value chains participated in the
trainings in Sikasso, Bougouni, Yanfolila, Koutiala, Kita
and Diolila between 26 December 2020 and 06 January
2021. Need to think about and apply adapted and
contextualized responses

Empowering women and combating gender inequalities
requires inclusive and transformative approaches that
include:

- targeting to ensure that nobody is left behind and no
  need is forgotten or neglected
- reaching the areas of interest and impactful
  customize interventions that equally benefit women
  actors of the agricultural value chain

These actions require urgent interventions to act now by
investing more resources and energy in the
empowerment of women farmers to facilitate their
access to productive resources and their capacity in
agricultural innovations for a fairer, more equitable and
more balanced world.

On the occasion of the International Women’s Day of
2021, whose theme is chosen to challenge, we need to
advocate for and alert the world on actions that can
reduce gender inequality:
- Go beyond the production stage to support women in
each key segment of the agricultural value chain.
- Identify entrepreneurial and paid off-farm options
  for women in each key node of the agricultural value
  chain.
- Provide a ‘package’ of support services such as credit,
business development training, and transportation
  services for women farmers.
- Facilitate reducing women’s drudgery and access
to inputs, equipment and skills to help them take
  advantage of innovations, market, and development
  outcomes.

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Project: The Accelerated Varietal Improvement and Seed
Delivery of Legumes and Cereals in Africa (AVISA Project)
Funding: Bill & Melinda Gates Foundation
CRP: CGIAR Research Program on Grain Legumes and
Dryland Cereals
Far-reaching impact of technology and innovation: Saving time, boosting income and reducing household conflict in Zimbabwe and beyond

Simple agricultural innovations, such as soil probes to detect water and salinity levels at different depths, have not only helped smallholder farmers conserve scarce resources, they’ve reduced conflict within communities and fostered harmony in families. Interventions in Zimbabwe have demonstrated that returns on investment in R&D go far beyond increased yields and productivity.

The emerging language from Europe uses the term responsible research and innovation. These three words convey a vital message relevant to all of us working in this arena. It separates research – the pursuit of new technologies, from innovation – the process of developing better ways to do things while embedding technologies into functional socio-ecological systems. Responsible, suggests that we ethically engage in this process. In the words of Professor Jamie Pittock of the Australian National University, our lead partner in the Transforming Irrigation in Southern Africa (TISA) project, “Do no harm.”

In complex systems such as irrigated agriculture, where interventions in one place may have unexpected outcomes in others, the TISA team kept a sensitive finger on the rhythm of activities in the target irrigation schemes. Regular focus group discussions linked the project team and support services with farmers. Farmers, in this case, have a healthy representation of dedicated and hard-working women.

The project introduced the Chameleon, a handheld instrument that measures soil moisture using three probes planted at different depths (close to the soil surface, within the crop’s root zone and beyond the rootzone). The tool’s exceptional value lies in its simple user interface. Three LEDs (one for each depth) emitting either red, green, or blue light provides irrigators with immediate information on whether the soil is dry, moist or wet at the different levels. Irrigators can also measure soil moisture after irrigation events to assess how deep the water has penetrated.

This information is further enriched by using a pair of Fullstops – wetting front detectors – established within and beyond the root zone. A flag pops up when the water reaches and fills the funnel at the instrument’s bottom, allowing irrigators to extract a water sample.

Zimbabwean farmer irrigates her field.

Photo: A Van Rooyen, ICRISAT
from each depth to determine nitrates and salinity.

A high nitrate level within the root zone is the goal, while an increased nitrate level beyond the root zone indicates that expensive nutrients are leached beyond the crop’s reach. Together, these instruments provide vital information to improve decision making regarding irrigation water and nutrient management. Farmers can now experiment and learn, strengthening their mental models of the relationship between irrigation frequency (and amount) and nutrient losses.

In one of the intervention locations Silalatshani, based on their own initiative, farmers retained nutrients in the root zone by reducing irrigation frequency, reducing the number of siphons used and the duration of each irrigation event. Consequently, water productivity increased by more than 100%. Farmer-to-farmer learning resulted in more farmers reducing irrigation frequency than the number of farmers who had tools installed in their fields. At the beginning of the project farmers in Silalatshani irrigated their crops an average of 20 times during the growth cycle. By the end of the project’s first phase, both farmers with and without tools reduced irrigation events to less than nine times per season.

“Earlier, I used to always irrigate whenever water was flowing in the canals. I would not miss the opportunity to utilize the water as I always thought more water translates to higher yields,” said Mr Sergeant Nkomo, a farmer at the Landela block at Silalatshani.

Yields increased significantly, as did income because the innovation platforms working in the region also linked farmers to markets. In short, irrigators reduced their time spent in backbreaking work, while increasing yields and income. Many women farmers indicated that they invested the time saved into spending more time with children, engaging in other social activities, and increasing off-farm income from various other activities. A particular case is Ms Sihle Sibanda, who significantly increased yields and income during the project to support her daughter to complete a Bachelor’s degree in Commerce at the National University of Science and Technology.

A completely unexpected outcome raised by farmers during focus group discussions and verified during the end-of-project survey was reductions in conflict from within the household, between farmers within an irrigation block, all the way to between the scheme and other water users. Reductions in conflict within the family are significant for women. They suggested that they have more access to income and do not have to quarrel with spouses for resources to purchase food and pay school fees!

“In the past we used to have so many arguments with irrigators downstream of our block as water would mainly be utilized by our block, which is closer to the supply dam,” said Ms Sibanda, who is also Chairperson of the Landela Block Irrigation Management Committee. “However, with the introduction of the tools, we are now using water sparingly and downstream users are surprised if we are using the water at all as they are receiving enough supplies for their irrigation.”

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Women strengthen household nutrition and turn entrepreneurs with nutri-gardens

As one of the key activities undertaken by our watershed projects to improve household nutrition in rural Telangana and Andhra Pradesh, India, encouraging women farmers to start small vegetable gardens in their backyards has been very successful. These ‘nutri-gardens’ also help augment household incomes, especially during times of job losses and restricted mobility due to the COVID-19 pandemic.

The following are some heartening stories told by enterprising women beneficiaries of two joint projects of ICRISAT with the Rural Electrification Corporation Limited (RECL), India, and AB InBev respectively.

Success stories from RECL-ICRISAT project
Nutri-garden kit comprising vegetable seeds, mini-sprayer, fertilizers, pesticides, etc. being given to women farmers

“With the support of this project, I got vegetable seed, sprayer and other inputs, with which I established a small nutri-garden near my home. With no extra effort, and using my kitchen waste water, I have obtained good yield of bitter gourd, ridge gourd and leafy vegetables like ‘palak’ (spinach) and ‘gongura’. For several weeks now, we have been having fresh, home-grown vegetables and will continue this practice rather than going for long distances to purchase from shops.”

Ms K Vanaja, Kondampalli village, Anantapur, Andhra Pradesh.

(All Anantapur photos by Samatha and ICRISAT)

“My family is very happy with this attempt of mine to set up a vegetable garden in our home backyard. With advice from the project staff, I used vermicompost before sowing the seeds. I could clearly see the improvement in yield and quality of vegetables, especially bitter gourd, brinjal and ridge gourd. I have sold nearly 30 kg ridge guard and 14 kg bitter gourd in the village so far and got good profits. Apart from that, my neighbors also got inspired by me and now they have also started growing vegetables in their home premises.”

Ms K Gayathramma in Settipalli village, Anantapur.
“The price of vegetables has gone up very high, especially during the COVID-19 times. We could not get work during those hard times and faced financial crisis. That was when I received good support from the project. I could grow fresh leafy vegetables and guards at my home, and thus also supported my family and neighbors.”

Ms M Nagamma in Cherlopalli village, Anantapur.

“Earlier I used to buy vegetables from the shop and spent money on that. Then I was supported with inputs provided under RECL-ICRISAT watershed project and was guided to establish a small vegetable garden near my home. Now I am getting good quality vegetables like ‘palak’, ridge gourd and ‘bhindi’ (okra) from my own nutri-garden. I am using these vegetables for household consumption and saving around Rs 40 per day and selling the extra produce.”

Ms Laxmi in Rajapeta village, Wanaparthy. (All Wanaparthy photos by BISLD and ICRISAT)

“I was supported with inputs for nutri-gardens under the project which helped me establish a garden in which I now produce quality vegetables. I am providing nutritious food to my family, reduced daily expenditure on vegetables and also selling the extra produce for extra income.”

Ms Chandrakala in her nutri-garden in Peddagudem village, Wanaparthy.

“I own three cows and five buffaloes. Every year I would buy dry fodder, which is expensive, from the neighboring farms. After the intervention of new fodder grass through the project, I have got it at a very low price. I have harvested the grass multiple times, and observe quick growth after each cutting. Milk quantity and quality from my cattle has improved with this fodder and now I don’t need to purchase any grass from outside.”

Fodder Sorghum (CSH24MF) grown by Ms A Lakshmi Devi in Gonipeta village, Anantapur.
“It is easy for me to feed my cattle in my home premises as there are very few pasture lands available during the cropping season. Along with dried straw, I can feed them green fodder which has resulted in increase of milk yield by 1 liter per day. The fat content reading of the milk is also higher and I’m making up to ₹ 35 per liter compared to ₹ 30 per liter earlier.”

Fodder Sorghum (CSH24MF) grown by Ms B Kavitha in Kondampalli village, Anantapur.

“I got subsidized seeds and guidance about growing fodder sorghum through the project. This crop is giving a good yield and has improved green fodder availability. Alongside this, I am also feeding groundnut straw to my sheep. With this feed regime, the sheep’s weight gain is faster than earlier feeding system.”

Ms A Venkatamma, who grows fodder sorghum (CSH24MF) at Peddagudem, Wanaparthy.

“From the project I received ICGV 91114 groundnut variety and obtained 110 kg per acre additional pod yield compared to the neighboring farms. Apart from this, after drying, I am using crop straw as animal feed for sheep/goat which has enhanced the body weight of our livestock.”

Ms K Devi Bai in Settipalli village, Anantapur, who uses groundnut (ICGV 91114) straw as fodder for her sheep/goat.

“Through the watershed project, I was given with a ram lamb worth ₹ 3,000. I reared the lamb for about 6 months and sold it for ₹ 15,000. With this money I repaid the amount to the SHG (self-help group) and with the ₹ 12,000 profit, I purchased four more lambs and took up this activity on a bigger level. Now I and my family are living well. I could use the saved money for various family needs. Thanks to this project for bringing a change in our lives.”

Ms T Lakshmi Narasamma, Gonipeta village, Anantapur.

“I started this activity with two lambs that the project gave me in 2017-18. Now I am rearing 10 rams, some were sold for meat purpose and generated good income. With the saved money, I was able to pay electricity bills, purchase vegetables and groceries for our home needs.”

Ms P Bharatamma, Kondampally village, Anantapur.
Success stories from AB InBev-ICRISAT project

Ms Rathnavva is a 60-year-old woman farmer in Venkatakistapur village of Sangareddy district in Telangana state. She volunteered to establish a nutri-garden in her backyard, and so she was provided with inputs and other technical knowhow by the project staff. She planted vegetables such as okra in around 50 square meter area. During rainy season, she harvested around 30 kg of vegetables. She is very happy that she has helped enhance the nutritional status of her family, especially during the COVID pandemic. Ms Rathnavva feels that promoting nutri-gardens is a good practice that assists women farmers in getting incomes, while also effectively contributing to household nutrition.

Ms Bekkem Shantamma, who was part of the livestock-based livelihood interventions at Rajapeta village, Wanaparthy with her ram lambs.

“The project supported me with ₹ 4,000 to start a livestock-based livelihood. I purchased three small ram lambs, reared them and sold them at nine months age for ₹ 18,000. After repaying my loan, I still made a net profit of ₹ 14,000, with which I bought five ram lambs and, in this way, started this activity as my livelihood. I’m earning a good amount this way.”

Ms Naramma, of Peddagudem Village, Wanaparthy, who enhanced her groundnut crop by applying secondary and micro nutrients.

“The watershed project team advised me to add gypsum, zinc sulphate and borax to groundnut crop and also provided highly subsidized inputs. With application of these fertilizers, the effect was clearly visible in the crop. It was reflected in around 100 kg more pod yield and quality in micronutrient applied plot. I am very happy with this! I’m now aware about reducing costs of other inputs such as urea and DAP (Diammonium Phosphate).”

Ms Sathyamma of Venkatakistapur village: “With the help of vegetable seeds and guidance provided by project team, I established a small nutri-garden with brinjal and okra in around 10 square meters. This has enabled me to not buy vegetables from the market for more than five weeks and thereby save that cost. I am happy to have such support and will seek it in future also.”

Ms Suvarnamma of Gopularam village: “Because of the Coronavirus, there was fear in visiting markets to buy vegetables, but thanks to my nutri-garden, which I started with help from the project, we now have access to fresh vegetables, while keeping the family members safely at home.”

Ms Sugunamma of Gopularam village: “I feel happy that I harvest around 1 kg of brinjal and 0.5 kg of okra every three days. I and my family are happy to have access to pesticide-free vegetables.”

Project: Farmer-centric Integrated Watershed Management for Improving Rural Livelihoods
Funder: Rural Electrification Corporation Limited; AB InBev
Partners: NGOs (Samatha Society for Rural Education and Development, Anantapur; BAIF Institute for Sustainable Livelihoods and Development, Hyderabad); Watershed Associations; Department of Agriculture, AP; ICRISAT.
Strengthening Early Generation Seed production and delivery systems in Uganda

Key stakeholders in Early Generation Seed (EGS) production and delivery systems in Uganda met recently to introduce activities conducted with the aim of implementing business models for EGS production in the country. They also deliberated on steps needed to pilot/scale the EGS business model for sorghum and finger millet in Uganda.

As a means to tackle the challenge of inadequate EGS supply in Africa, the Integrated Seed Sector Development Africa project, which organized the above meeting, is trying to implement business models in EGS production, led by ICRISAT. The goal is to explore EGS supply initiatives in sub-Saharan Africa and South Asia to reveal best practices as well as bottlenecks and eventually generate ideas for designing and piloting models that can work in specific contexts. The stakeholders met at the National Semi-Arid Resources Research Institute (NaSARRI) of the National Agricultural Research Organization (NARO), Uganda.

Dr Michael Ugen, Director, NaSARRI, appreciated the timeliness of the project considering the number of improved varieties that need to reach farmers – the intended users of these improved technologies. He also emphasized the need to create demand for the seed by informing farmers about the importance of regularly replacing (renewing) seed stocks if they are to benefit from the high productivity and adaptability of the improved non-hybrid varieties.

The stakeholders agreed to develop a Memorandum of Understanding with selected seed producers. They also agreed that NARO Holdings would do a cost analysis and provide the EGS production plan for sorghum and finger millet while NaSARRI maintains production of breeder seed. NaSARRI will lead in identifying potential seed producers who would work closely with the two institutions as out-growers for foundation seed.

The meeting, conducted on 4 March 2021, was attended by 18 stakeholders (14 men and 4 women), including breeders from grain legumes and dryland cereal crops breeding programs; management staff; seed company representatives; seed producer farmer organizations; non-government organizations NARO Holdings Ltd.; and Local Government representative from the Ministry of Agriculture, Animal Industry and Fisheries (MAIF).

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Stakeholders who participated in the meeting.

Project: Integrated Seed Sector Development Africa (ISSD Africa)
Funder: Swiss Agency for Development and Cooperation (SDC)
Partner: Wageningen University and others
Building seed business hubs around women and youth in Tanzania

AVISA project

Working with private seed companies, ICRISAT is helping integrate more women and youth into seed production enterprises in Tanzania. Recently we supported the efforts of the seed company Mbozi Highlands (MHEG), to enhance the production, promotion, marketing and adoption of new high-yielding varieties of groundnut and sorghum in the country. This was by designing and developing training manuals to train farmers, identifying and contracting 92 new seed producer groups (women and youth); facilitating inputs for 100 seed producer groups; and identifying suitable areas for establishing 300 variety demonstration plots.

Adopting our initiative – Seed Revolving Fund, Youth Engagement and Gender Inclusion (SRF-YEGI) – the company is focusing on increasing the number of youth and women participating in specific nodes along the seed value chains. Mr Aron Mwalughelo, Managing Director, MHEG, said that the company is committed to working closely with women and youth groups to develop and sustain seed business hubs for both crops – groundnut and sorghum – in the Southern Highlands of Tanzania.

For the first year of activity (2019-2020 cropping season), women and youth seed producer groups produced, cleaned and delivered seeds to MHEG as per agreed contract. Eight groups produced 1.2 t and 4.8 t certified seeds of groundnut and sorghum, respectively.

To meet the high demand (about 10 t) of sorghum seeds, the company worked with a women’s group to produce irrigated sorghum seeds on five acres at Momba District. MHEG also approached the Tanzania Agricultural Research Institute (TARI) for guidance in producing basic seeds of sorghum (Macia) and groundnut (Mnanje).

With financial and technical support from ICRISAT, MHEG worked with the Center for Behavior Change Communication (CBCC) to design and develop two training manuals – the Sorghum Production Manual and the Groundnut Production Manual – to train seed and grain farmers for greater adoption of new varities.

Through SRF-YEGI, MHEG is working on increasing sorghum and groundnut seed production and conducting variety popularization activities. The plan for 2020-2021 involves identifying and contracting 92 new seed producer groups (Women and Youth); facilitating inputs for 100 seed producer groups; and identifying suitable areas for establishing 300 variety demo plots.

ICRISAT is glad to partner with the company to create vibrant seed systems in Tanzania and for enhanced livelihood for women and youth. We envision a robust seed supply system that increases the quantity and quality seed of superior varieties; boosts the availability of early generation seed (EGS) by strengthening the technical, management and business capacities of key players; establishes a clear path and handover process from the research system to the private sector; enables private sector multipliers to seize opportunities to capitalize on the commercialization of these crops; and embraces diversity where women and youth are well served and included in seed delivery models.

ICRISAT is also committed to replicate the success of the seed revolving fund (SRF) model developed and successfully implemented in Malawi to address limited production and supply of EGS, with modifications where necessary. The intention is to involve public and private partners at each stage of the seed value chain, and ensure that each player is well rewarded.

For more on our work with women, click here: http://explore.it.icrisat.org/profile/gender/60

For more on our work in Tanzania, click here: http://explore.it.icrisat.org/profile/Tanzania/799

Project: Accelerated Varietal Improvement and Seed Delivery of Legumes and Cereals in Africa (AVISA)
Funder: Bill & Melinda Gates Foundation; USAID
Partners: ICRISAT (lead), International Center for Tropical Agriculture (CIAT), International Institute of Tropical Agriculture (IITA) and National Agricultural Research Systems partners (NARS) from 7 African countries
CGIAR Research Program: Grain Legumes and Dryland Cereals

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CGIAR Research Program: Grain Legumes and Dryland Cereals

This work contributes to UN Sustainable Development Goals
In a remarkable turnaround, farmers in Northern Nigeria organized themselves into innovation platforms, and with support from the Tropical Legumes (TL) project funded by the Bill & Melinda Gates Foundation, turned into successful groundnut seed producers in 2011. The impacts of those actions are felt even today, with farmers continuing to adopt improved variety seeds and good agronomic practices to obtain high yields that help them improve their nutrition as well as incomes in the community.

In Kausani community, Kano State, Northern Nigeria, 11 years ago, production and productivity of groundnut and other legumes was falling. There was also an absence of improved technology packages and, in particular, improved seeds were lacking. This had negatively affected farmers’ income and commercialization of legume production, pushing farmers into food insecurity and poverty.

Then, motivated by a strong desire to improve their conditions, the farmers decided to become part of multi-stakeholder platforms called innovation platforms (IPs) that helped them strengthen seed multiplication, thanks to the TL project. “The TL project has saved groundnut production in Kausani Community,” says Mr Balarabe Inuwa, member of the farmers’ association. Prof Sanusi Gaya, a groundnut breeder at the Centre for Dryland Agriculture, Bayero University of Kano (CDA/BUK) explains, “Members of the association cherished the TL project as a development intervention which focused on enhancing smallholder farmers’ access to seeds of improved groundnut varieties.”

As a continuity, the selection of appropriate project location, reliable beneficiaries, training on good agronomic practices (GAPs), and effective supervision on production activities, among others, were the major reflections of the TL projects imbibed by the Accelerated Variety and Seed System for Cereals and Legumes in Africa (AVISA) project launched in February 2019. “Now AVISA is here to consolidate the previous efforts of the TL project and put smiles on the faces of smallholder farmers,” adds Mr Inuwa.

AVISA’s approach is the continued use of IPs to serve as a medium of activities to drive technological innovation among members and communities at large. Members of the association strongly consider the donors and implementers of the project as the major drivers of the revival of groundnut production in Kano State in particular, and Nigeria as a whole. “There is no household in the Kausani community that will claim using any other variety apart from those brought to us by TL and AVISA projects,” testifies Mr Abdullahi Musa, a member of the KSPA (Kausani Seed Producers’ Association).

During the 2020 rainy season, 20 farmers in the Kausani community were engaged in demonstrations and
foundation seed production of three improved varieties – SAMNUT 24, SAMNUT 25 and SAMNUT 26 – that are early-maturing, and give higher pod and haulm yields compared to the local cultivars. In addition, they are resistant to common pests and diseases, and retain their green foliage up to maturity, which enhances profitability.

Farmers who have adopted these improved varieties have produced 2.15 t of grains and 2.02 t of quality haulms per hectare. The seed produced will be distributed and used to support more farmers getting into certified seed production in the 2021 rainy season. This will help to meet the growing demand for improved groundnut varieties. “All those years ago, we lost hope on groundnut production, mainly due to lack of quality seeds,” says Mr Kabiru Adamu from KSPA. “But now, the story is different!”

The support of the TL and AVISA projects through farmer associations and innovation platforms has opened a window on opportunities to members engaged in demonstration plots with strict adherence to GAPs that has helped them produce quality seeds, including those of newly released improved varieties. There has also been an expansion in land area under groundnut production. According to Prof Gaya, “Members believe that the use of demonstration plots to showcase the performance of new groundnut varieties play a key role in convincing farmers to adopt the improved varieties and adapt their associated technologies.”

Activities of the innovation platforms started under the TL project, and now being pursued under the AVISA project, include awareness generation among community members, pre-season training on GAPs, inputs distribution and periodic supervision by the project team to assess progress including pre-production, production and post-harvest handling and operations. The impact in yield and income was extended to improve other livelihood activities such as financing children’s education, health care delivery, clothing, housing, and other essential needs of the households. “The quality characteristics of the SAMNUT varieties has increased the number of women who venture into artisanal groundnut processing for economic development,” explains Mr Garba Ali, a KSPA member.

In a decade’s journey, it is no mistake to say that KSPA of Wudil Local Government Area of Kano State, established in 2010, has become a stronghold on groundnut technology adoption and dissemination using the assets and capacity of an innovation platform.

For more on our work in Nigeria, click here: http://explore.it.icrisat.org/profile/Nigeria/361

For more on our work on groundnuts, click here: http://explore.it.icrisat.org/profile/Groundnut/250

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Project: Accelerated Varietal Improvement and Seed Delivery of Legumes and Cereals in Africa (AVISA)
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Partners: IITA, CIAT, Institut de l’Environnement et Recherches Agricoles (INERA), Burkina Faso; Institut d’Economie Rurale (IER), Mali; Council for Scientific and Industrial Research-Savanna Agricultural Research Institute (CSIR-SARI), Ghana; Institute for Agricultural Research (IAR) of Ahmadu Bello University (ABU) and Usmanu Danfodiyo University of Sokoto (UDUS), Nigeria; Ethiopian Institute of Agricultural Research (EIAR), Ethiopia; Department of Research and Development (DRD), Tanzania; National Semi-Arid Resources Research Institute (NaSARRI) of the National Agricultural Research Organization (NARO), Uganda; and ICRISAT

CGIAR Research Program: Grain Legumes and Dryland Cereals

This work contributes to UN Sustainable Development Goals

1. No Poverty
2. Zero Hunger
5. Gender Equality
9. Industry, Innovation and Infrastructure
17. Partnerships for the Goals
Sorghum scientists from public and private sectors across India gather to share insights on modern breeding technologies

Continuing a long-standing partnership with sorghum scientists across institutes in India, a long-overdue field day showcases elite breeding lines, varieties, hybrids and hybrid show cased parental lines of sorghum at ICRISAT Hyderabad. Proceeding with all necessary precautions in place as per our COVID-19 guidelines, participants shared valuable insights on the progressive evolution in sorghum breeding with modern tools and technologies that enabled better efficiencies in breeding and selection.

Welcoming sorghum researchers from the public and private sectors across the country, Dr Harish Gandhi, Theme Lead, Crop Improvement, and Interim Global Head–Breeding, highlighted inclusion of new areas in sorghum research agendas. Citing the implementation of focused product profiles as high priority for ICRISAT's breeding program, he said that apart from being considered a food grain, sorghum should be looked at for other uses too e.g. fodder, brewery etc. Besides, he underlined the importance of growing forage and biofuel segments in the rainy and postrainy seasons. He also appreciated ICRISAT for using new diverse germplasm lines in hybrid parental line development and its diversification.

Dr Arvind Kumar, Deputy Director-General Research, ICRISAT, said, "This sorghum field day is the first official event that we’ve held after starting 100% work back in the workplace." Hailing the public-private partnership breeding approach, he congratulated the sorghum team and partners, and hoped for continued collaboration to make a difference in delivering breeding traits germplasm and more in the future.

Dr M Govindaraj, Senior Scientist, Sorghum Breeding, led the group to postrainy breeding fields, presenting field plans and pipeline materials at various generations (~2000) and their trait specificity to participants to enable them to make appropriate selections. He emphasized the new method (chemically induced male sterility) that his team is validating to estimate the combining ability of sorghum B-line breeding pipelines and drone phenotyping with the support of the Excellence in Breeding Platform (EiB) through Dr Vincent Vadez (IRD, France). He recalled how in 2020, with great support from Dr Peter Carberry, then-Director General, CIOT staff, and other Theme Leads, critical breeding materials were harvested during the lockdown period and were now being displayed.

Dr Rajan Sharma, Cereal Pathologist, ICRISAT, briefed the participants on sorghum pathology screening, while Dr Jaba Jagadeesh Scientist, Integrated Crop
Participants of the sorghum field day on the last day.

Management, ICRISAT showed them around the insect pest screening facility. Dr Vetriventhan, Senior Scientist, Genebank, ICRISAT, explained sorghum germplasm diversity and elite germplasm, while the high-throughput early drought screening (LeasyScan) facility was explained by Drs Sunita and Sivashakti, Crop Physiologists, ICRISAT.

The Sorghum Scientists Field day was conducted support from the Sorghum Hybrid Parents Research Consortium (SHPRC), on 8 and 11 March 2021. A total of 23 scientists from the public and private sectors attended this meet which included 16 on-field participants and seven virtual participants. Due to current restrictions on travel owing to the ongoing pandemic, several other researchers from out of town were unable to attend in person.

Click here to watch a video on https://youtu.be/ub1e5ig23pY

Partners: Indian Institute of Millets Research (IIMR); Professor Jayashankar Telangana State Agricultural University (PJTSAU); Hytech Seeds Pvt Ltd; Classic Seeds Pvt Ltd; Super Seeds Pvt Ltd; UPL India Ltd; Rasi Seeds; KD Seeds; and ICRISAT.

For more on our work in sorghum, please click here
Partnerships

Joining hands with reputed agri university to drive livelihood enhancement for Telangana farmers

A high-level delegation from Professor Jayashankar Telangana State Agricultural University (PJTSAU) recently visited our Hyderabad campus and discussed options to collaborate on various aspects to benefit smallholder farmers of Telangana state, India. Crop diversification, groundnut crop improvement, plant protection technology, capacity building etc. were discussed as possible avenues of cooperation.

“ICRISAT’s expertise in technology – be it genomics, pest/disease modeling, crop improvement or natural resource management – is well known,” said Dr V Praveen Rao, Vice Chancellor, PJTSAU. “PJTSAU has great research infrastructure and a talented pool of researchers. We can work together to build capacity of our young scientists and help get the latest agri technology and its benefits rapidly to the state’s farmers who need them most urgently.”

“ICRISAT is glad to be associated with PJTSAU and earnestly wishes for PJTSAU to be our strong and strategic partner while working closely with the Government of Telangana to support the needs of poor farmers,” said Dr Jacqueline Hughes, Director General, ICRISAT, while interacting with Dr Praveen Rao. Earlier, Dr Praveen Rao explained how the university is playing a stellar role in providing technical assistance in formulating agriculture-related policies and schemes that benefit the farming community.

Stating that, in general, Telangana farmers adopt improved crop varieties readily, Dr Rao saw that as a great avenue to disseminate and replace existing age-old varieties in groundnut with newly developed high-yielding, high-oil/high-oleic and confectionary type varieties, for example, among the groundnut farmers here.

Crop diversification – breaking the rice-rice cycle – was another area where ICRISAT and PJTSAU can work together to provide viable options of other crops such as chickpea, pigeonpea etc. to the farmers so that soil quality is preserved and also farmers are economically benefited.

Dr Arvind Kumar, Deputy Director General – Research, remarked on the reputation of the University, which has gone from strength to strength over the decades. Dr Kumar agreed to the suggestion of the Vice Chancellor to collaborate with PJTSAU scientists in joint proposals and to initiate purposeful partnerships. Further, he expressed urgency in supporting graduate students (MSc and PhD) to undertake project work utilizing cutting-edge technologies through ICRISAT scientists. Dr Harish Gandhi, Regional Breeding Lead, suggested collaboration in developing demand-led millet varieties for Telangana farmers through farmer-led product profile development, resulting in creation of a pipeline of improved millet and sorghum varieties. Dr Anthony Whitbread, joining virtually from Tanzania, recounted several areas which had scope for collaboration viz. value chain development, geographic information systems (GIS), agronomic methods etc.

The team was taken on a tour of the facilities in the ICRISAT campus. They started with the Genebank, which
stores over 128,000 accessions (samples) of seeds from various crops from different locations – an attempt to conserve the genetic biodiversity of legacy crop. At the Seed Processing Facility they witnessed demonstrations of automatic seed sorting, grading and counting, highlighting the drastic reduction of time taken for seed processing now from about four weeks previously to 1-2 days now. They were also given an overview of ICRISAT’s work on plant pests and diseases to counter present and future threats.

At the Center for Excellence in Genomics and Systems Biology, Dr Rajeev Varshney, Research Program Director, Genetic Gains, elucidated the genomic tools and their role in enhancing precision and efficiency in crop breeding programs. He mentioned that as part of their knowledge-sharing training sessions, over 50 early- and mid-career plant breeders from PJTSAU had already been trained in use of the genomics tools and technologies.

Soil health interventions by ICRISAT Development Center (IDC), such as those carried out in Odisha, would be greatly useful in determining the soil quality of Telangana fields and carrying out appropriate remediations. They were given a presentation on the watershed interventions by IDC in Bundelkhand region, where construction of water-harvesting structures has resulted in increased groundwater recharge, higher crop yields and better livelihoods for the smallholder farmers. The visitors showed keen interest in the natural resource management work done by IDC in Karnataka and discussed scaling up of projects such as Bhoosamrudhi in other locations. Dr Kiran Sharma, Director, CRP GLDC, and Theme Leader – Agribusiness and Innovation Platform (AIP), provided an overview of AIP and its four programs. He underlined the role of AIP in supporting technology transfer, start-up promotion. He especially discussed value-addition opportunities in millets that linked with community development initiatives. Dr Manzoor Dar, Senior Development Specialist- Seed Systems, Scaling and Impact proposed a novel seed systems approach for Telangana state.

PJTSAU was originally set up in 1965 as Andhra Pradesh Agricultural University. Subsequently, it was renamed as Acharya NG Ranga Agricultural University (ANGRAU) on 7 November 1996 in honor of Acharya NG Ranga, who is regarded as an outstanding educationist, farmer leader and freedom fighter. In 2014, as a result of bifurcation of state of Andhra Pradesh, ANGRAU was renamed Professor Jayashankar Telangana State Agricultural University on 3 September 2014 to commemorate Professor Jayashankar, an eminent educationist and an ardent Telangana ideologue. PJTSAU is the only agricultural university of Telangana State and ranked 10th among 72 state agricultural universities in the country. Dr Jagadeeshwar R, Director of Research; Dr Pradeep T, Director-Seed Research & Technology Center; Dr V Anitha, Dean, Post-Graduate Studies, and Dr Kalpana Sastry, Managing Director, Agri-hub Foundation and other university officers joined the honorable Vice Chancellor during this visit.

The team from PJTSAU visited ICRISAT, Hyderabad, on 16 March 2021.
Bringing agriculture research, development and extension systems together

Agricultural extension training organization MANAGE and ICRISAT are exploring new opportunities to partner that will strengthen and integrate capacity building across the whole agricultural value chain. During a recent visit to the Hyderabad MANAGE campus, a 3-member team from ICRISAT discussed the signing of an MoU to begin a fruitful association.

One of the suggested areas of collaboration was agricultural development for corporate social responsibility (CSR) projects. As one of the members of MANAGE’s CSR Knowledge Forum, ICRISAT is known for its successful track record in completing CSR projects. Hence, we could play a key role in guiding CSR leaders and implementing projects.

Another area where our expertise was requested is the promotion of farmer producer organizations (FPOs). Providing policy support to FPOs, documentation of case studies, policy briefs etc. and training personnel in the same, would be a great support for MANAGE members.

Upscaling innovative agri concepts in other countries of Asia and Africa; supporting extension services towards climate-smart agriculture, promoting agri-preneurs through start-up initiatives were some of the other suggested areas of partnership.

As a first step in this direction, it was decided to formulate a Memorandum of Understanding for a collaboration between MANAGE and ICRISAT.

The meeting was held on 15 March 2021.

MANAGE (National Institute of Agricultural Extension Management) is an autonomous extension and agribusiness management institute located in Hyderabad, India.
In the media

Watershed interventions provide groundwater access all year through

Water conservation structures in Anantapuramu: A check dam (L) constructed in Kondampalle village, Anantapuramu, during 2017 has led to increase in groundwater levels that benefits a newly constructed pond (R) in Ramachandra Reddy’s farm, providing sufficient water to irrigate a second crop. The check dam constructed in 2017 through the project has ensured that groundwater is available at a depth of 3 meters. Before the project, even water for drinking purposes was not available, and groundwater was available only at about 183 meters during the dry seasons,“ he says.

In the semi-arid tropics water is a precious resource that often does not trickle down to small farms. Farmers who can afford borewells, save their crops during dry spells in the cropping season whilst others watch crops and investment dry up. Now, a CSR project led by ICRISAT has shown how watershed interventions contributed to a 2-meter rise in groundwater in Anantapuramu district, Andhra Pradesh state, South India. The RECL-ICRISAT watershed sites provide proof of concept for holistic solutions that improve system productivity and livelihoods. In project villages compared to non-watershed villages, even a 10-foot deep farm pond yielded quick access to irrigation water. Eighty new ponds dug during 2020-21 created extra storage capacity of around 16,000 m$^3$ bringing the total to 66,000 m$^3$, benefiting 1500 smallholders in the region by providing water all year through.

Remote sensing/GIS and hydrology studies coupled with ground truthing during the first phase of the project (2014-17), were followed by a series of check dams and other water conservation structures built in the region. This led to a steady increase in groundwater levels by up to 2 meters compared to non-watershed villages, creating a net water storage capacity of more than 50,000 m$^3$. Because of the storage capacity generated, around 125,000 m$^3$ rainwater gets recharged into the groundwater table, increasing water availability for irrigation and other uses.

Major water conservation measures implemented at Anantapuramu site include 58 farm ponds, 15 check dams, 256 rock-filled-dams/loose-boulder-structures, 43 open-well/borewell recharging pits and 7 sunken/mini-percolation pits.

Water structure interventions and good rains during the year, in some cases, contributed to an even higher increase in groundwater levels reaching up to 14 meters as in Kondampalli, one of the project villages. Today about 14 beneficiaries with 20 ha have benefitted, and about eight bore well recharge pits have ensured that water is readily available throughout the year. As many as 36 farm ponds were constructed in the village during 2020-2021, and more farmers are coming forward to build ponds.

In nearby Gonipeta village, twenty farmers and their families have benefited from the interventions, and more are keen on constructing ponds in their fields. The check dam built in the project’s first phase ensured that about 16 ha of land have water available all year. Groundwater in some cases is now available at a depth of 2 meters providing enough water for cultivation during the rainy and post-rainy seasons.
Similar on-farm water storage solutions and productivity/livelihood initiatives are underway in Wanaparthy site in Telangana state. The RECL-ICRISAT watersheds are developing into exemplar sites as proof of concept for scaling critical on-farm solutions for climate resilience and improved livelihoods. It shows the potential way forward for increasing water access in drylands, and also for leveraging CSR to empower the underprivileged, while contributing to food security and ecosystem services.

Read more on Natural Resource Management on EXPLOREit

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This work contributes to UN Sustainable Development Goals

Project title: Farmer-centric Integrated Watershed Management for Improving Rural Livelihoods

Funding agency: Rural Electrification Corporation Limited, New Delhi, India

Partners: NGOs (Samatha Society for Rural Education and Development, Anantapuramu; BAIF Institute for Sustainable Livelihoods and Development, Hyderabad); Watershed Associations (Anantapuramu and Wanaparthy sites); Department of Agriculture, and line-departments (Andhra Pradesh and Telangana states, India); International Crops Research Institute for the Semi-Arid Tropics (ICRISAT).
Mr Olivier Lefay, Program Manager, Food Security, of the Delegation of the European Union in Mali, and Dr Ramadjita Tabo, Regional and Research Program Director, West and Central Africa (WCA), ICRISAT, during the Annual Review and Planning Meeting of the UE-APSAN-Mali project.

More than 80,000 farmers, seed and grain producers, agro dealers and processors in Mali were reached through radio and TV messaging during 2020. This complemented 145 demonstrations of new varieties of sorghum, pearl millet, groundnut and cowpea for 3,300 producers. Even during times of a pandemic, assistance to farmers must continue, as was aptly shown in the first year of the EU-APSAN-Mali project. Modernization of breeding programs using RapidGen and capacity building of young scientists were other important components of the work.

ICRISAT’s breeding programs are being modernized to rapidly develop climate-smart crop varieties aligned with market demand. This has enabled breeding programs of the National Agronomic Research Institute (IER) in Mali to start off-season production and, using RapidGen (Rapid Generation Advancement) through irrigation facilities, to carry out two generations of breeding material per year instead of one. Last year, varietal trials for the four crops were set up by ICRISAT and IER.

These major results of the first year of implementation of the EU-APSAN-Mali project, implemented by ICRISAT, were announced by Dr Ramadjita Tabo, Regional and Research Program Director, West and Central Africa (WCA), ICRISAT, during the project’s Annual Review and Planning Meeting held at ICRISAT research station in Samanko and at the headquarters of the IER. The main objective of the meeting was to discuss the results obtained during the first year and to take stock of the lessons learned in order to better plan the second year.

Thanking the European Union and project participants for the results obtained in record time, Dr Tabo said, “This project, which aims to improve the food and nutritional security of 10,000 direct beneficiaries, and also indirectly reach 30,000 producers of sorghum, millet, groundnut and cowpea in Mali, recorded encouraging results despite the constraint of the COVID-19 health crisis.”

Mr Olivier Lefay, Program Manager, Food Security, of the Delegation of the European Union in Mali, also appreciated the efforts made to increase productivity and lift populations out of poverty and malnutrition. He said he was encouraged by the transfer of technology and skills and by the linkage of the various stakeholders as part of a continuous learning process. He emphasized the important role of the Smart Food initiative in the implementation of the project in Mali. In the immediate future, the project plans to test acceptability of smart foods through studies, considering varieties evaluated and accepted by populations.
Dr Modibo Sylla, representative of the Director General of IER, and Dr Mohamed Dicko, Scientific Coordinator for irrigated crops at IER, representing the focal point of the EU-APSAN-Mali project at IER, welcomed the project’s contribution to increasing productivity of sorghum, millet, groundnut and cowpea value chains in the target regions. They also thanked the European Union delegation for its support for agricultural development in Mali.

Dr Baloua Nebie, Project Coordinator from ICRISAT, outlined the project objectives, impact pathways, interventions zones and targets of the project and the keys results achieved. He mentioned that of the 38 activities proposed in the project document, 27 effectively started in Year 1 with good progress, and therefore concluded to an implementation rate of 76%.

“Failure to carry out and the delay in starting some activities is mainly due to restrictions related to COVID-19, but the success rate is strong,” explained Dr Nebie as he described a participatory rural assessment of sorghum varieties that was carried out in synergy with the AVISA project, as well as regional trials implemented across eight countries (Mali, Niger, Burkina Faso, Chad, Senegal, Togo, Ghana and Nigeria) and 54 varieties shared to partners across WCA.

Another important achievement of the project is that nine doctoral students (four at ICRISAT, four at IER and one PhD student hosted from WASCAL program) and three Master’s students have been supported by the project for their end-of-studies internship at ICRISAT. Dr Dicko also highlighted the strength of the project in terms of capacity building: Six interns (Master’s students) and one doctoral student under each research program and 43 other Master’s interns were supported.

On the occasion, the doctoral students recruited at ICRISAT and IER gave each presentation of their research theme and protocol. “We’ve conducted preliminary trials, participatory trials and demonstrations, and distributed mini sachets of seeds of the promoted varieties,” added Dr Dicko. “Activities to modernize breeding programs have contributed to the strengthening of the irrigation system of the four crops and the renovation of greenhouses and drying areas for sorghum and groundnuts within the IER. In addition, regional trials have been conducted with 20 varieties of millet; 28 varieties (16 dual purpose) of sorghum; 18 varieties of groundnut; and 22 varieties of cowpea.”

Other highlights of the meeting included a discussion about participatory varietal selection in the process of genetic improvement of crops, data management tools and innovation platforms. According to a testimony reported by Ms Aminata Tangara, Director of the NGO MALIMARK (Mali Agricultural Market Development Trust) and team, “The project innovation platforms have made it possible to train more producers in hybrid seed production techniques; to distribute mini bags to producers and thus improve access to new varieties of cowpea, sorghum, millet and groundnut.”

The review and planning workshop of the EU-APSAN-Mali project took place in two phases. The first phase (1-2 March 2021) focused on research aspects. The second phase (4 March) was a day workshop focused on the results achieved during the first year of the project implementation.
The meeting included three different working group workshops: (1) thematic discussion on breeding program modernization, socio-economic backstopping and smart food, (2) planning of Research activities in Year 2, (3) planning of dissemination and extension activities in year 2. Two side events were organized during the meeting at the Samanko: a visit of greenhouse renovation that is undertaken under the support of the European Union and the Bill & Melinda Gates Foundation on 1 March and a visit of the off-season sorghum seeds production on 4 March.

Participants gave their feedback on the exchange and farmer visits organized by the project around the sorghum, cowpea, millet and groundnut trials and demonstration plots. All partners (each in its capacity) were invited to present few success stories that marked year 1 of the project implementation. Many expressed their gratitude for the training of farmers on hybrid seed production techniques; the distribution of mini bags to producers and the availability of new varieties of cowpea, sorghum, millet and groundnut; demonstrations carried out 100% in certain areas, strengthened relations between researchers, producers and extension workers; excellent production of the Sorghum Soubatimi variety in some areas, with more than 3 tons per hectare; the installation of innovation platforms; the organization of farmer field days and the connection of participants through social networks and in particular the creation of a WhatsApp group.

The review and planning meeting of the UE-APSAN-Mali was co-organized by ICRISAT and IER.

Reported by Ms Agathe Diama (Head Regional Information and Smart Food Coordinator, ICRISAT-WCA) with contribution of Dr Baloua Nebie (Sorghum Breeder and Coordinator UE-APSAN-Mali project) and Dr Nadine Worou (Program Manager, ICRISAT-WCA).

For more on our work in Mali, please click here: Mali| EXPLORE/it@ICRISAT

**Project:** Enhancing Crop Productivity and Climate Resilience for Food and Nutrition Security in Mali (UE-APSAN-Mali)

**Funder:** The European Union

**Partners:** Institut d’économie rurale (IER); Farmer organizations (Union locale des producteurs de céréales-ULPC, Sene Yiriwaton, Coopérative des producteurs de semence du Mande-COOPROSEM, Union Nietaa et Jigiseme; Extension services; National Directorate of Agriculture-DNA and in particular the agricultural sectors of Kayes, Ségou, Kita, Koutiala and Yorosso regions; NGOs (Mali Agricultural Market Development Trust – MALIMARK, European Cooperative for Rural Development-EUCORD, Association Malienne d’Éveil au Développement Durable-AMEDD); seed companies (SOPROSA, Camara Semence, Dounka fa, Faso Kaba and Zamoho); Universities in Mali; CORAF/WECARD; and ICRISAT.

**CGIAR Research Program:** Grain Legumes and Dryland Cereals

This work contributes to UN Sustainable Development Goals
The European Commission hopes for greater collaboration to improve food and nutrition security

Delegates from the European Commission to Mali expressed interest in exploring new opportunities for collaborations with ICRISAT to improve food and nutrition security sustainably in the most vulnerable target areas of Mali. They discussed the progress made in implementation of the EU-APSAN-Mali project and also referred to ongoing discussions with World Agroforestry (ICRAF) and The World Vegetable Center (WorldVeg) for new projects to strengthen European Union (EU) interventions in the agricultural sector in Mali.

Ms Ioana Albulescu, Team Leader–Green Inclusive Growth, EU Delegation to Mali; and Mr Olivier Lefay, Program Manager, Food Security, EU Delegation to Mali, and focal point of the EU-APSAN-Mali project recently visited ICRISAT’s research station in Samanko, Mali.

Meeting with Dr Ramadjita Tabo, they talked about the evolution of the EU-APSAN-Mali Regional and Research Program Director, West and Central Africa (WCA) project in Kayes, Koulikoro, Ségou and Sikasso regions. They also met the heads of the other centers along with other representatives of World Agroforestry Centre and World Vegetable Center. Mr Lefay reiterated an invitation to Ms Agathe Diama, Smart Food Coordinator in WCA, to make a presentation on the insights of the Smart Food initiative to the EU during the next partners’ meeting in April. He said that it would create an enabling environment and inform partners about improving nutrition in Mali.

Ms Albulescu and Mr Lefay discussed synergistic actions with other partners and made plans for a subsequent visit to beneficiaries of the projects for directly interacting with them about the contribution of the research centers on their livelihoods. Dr Tabo highlighted the role of research centers in development and scaling interventions in order to create broader impacts.

Dr Baloua Nebie, Sorghum Breeder; Dr Aboubacar Toure, Product Placement Lead; and Dr Haylemichael Desmae, Groundnut Breeder and Regional Breeding Lead; showed them around the sorghum and groundnut off-season nurseries and seed production plots. The delegation was briefed on the challenges in crop production and commercialization in Mali; the ongoing breeding modernization efforts at ICRISAT; and the targeted breeding profiles in West and Central Africa (particularly in Mali). They also visited the greenhouses under renovation with funding from the European Commission through the DeSIRA Program (EU-APSAN-Mali project), and The Gates Foundation through the AVISA project.
The delegation then visited the agroforestry demonstration platform of ICRAF, followed by a visit to demonstration plots of the production and conservation techniques of The World Vegetable Center including a garden, zero-energy cooling shelters, laboratories and so on. Finally, they spent some time at the ICRISAT pathology laboratory and seed stores for sorghum and groundnut.

At the end of the discussions, Ms Albulescu commended the excellent partnership between EU and ICRISAT and all the research centers in Samanko.

The visit was conducted on 8 March 2021.

For more on our work in Mali, click here: http://exploret.icrisat.org/profile/Mali/346

Reported by Agathe Diama, Head Regional Information and Smart Food Coordinator, ICRISAT-WCA.

(L-R) Ms Agathe Diama, Head, Regional Information and Smart Food Coordinator ICRISAT-WCA; Mrs Aminata Guissey, Secretary at Regional Director’s office; Dr Jean Baptiste De La Salle Tignegre, Manager in Charge, WorldVeg, Mali; Dr Ramadjita Tabo, Regional and Research Program Director, ICRISAT-WCA; Mr Olivier Lefay, Program Manager, Food Security, Food Security, European Commission in Mali; Ms Ioana Albulescu, Team Leader–Green Inclusive Growth, EU Delegation to Mali; Dr Nadine O Worou, Program Manager, ICRISAT-WCA; and Dr Djalal Ademonla, ICRAF Representative, Sahel, West & Central Africa Region.

Recognition

ICRISAT scientist wins Women in Livestock Science award

Dr Clarisse Umutoni, Livestock Scientist,Dryland Systems and Livelihood Diversification, West and Central Africa, ICRISAT, received an award in the Women in Livestock Science category by ILRI CapDev Grand Challenge 2020/2021, in recognition of successful communication of her research. She communicated her work on dual-purpose pearl millet stover as animal feed in the West African Sahel to a panel of judges. Since its inception, the ILRI CapDev Grand Challenge has trained and mentored more than 300 young researchers from more than 50 national institutions that are ILRI’s partners.

The CapDev Grand Challenge is designed to enhance the capacity of next-generation livestock researchers and academics as well as livestock sector professionals through leadership, interpersonal and communication skills building and mentoring to become visionary leaders in the agriculture research landscape. The program involves a 10-month long capacity strengthening process with particular focus on writing science, pitching research and ideas in a compelling way, communicating research to different stakeholders, making effective presentations, working effectively and in interdisciplinary teams, and responsible conduct of research.

For the challenge, candidates each make a three-minute pitch of their research project to a panel of judges comprised of a donor, communications expert/journalist, policy development expert and a researcher. The judges select and award candidates with the most successful pitches.

“I was happy to present and explain my work to the judges, and also convince them why it’s important to invest in dual-purpose millet varieties, not only to boost the availability of quality fodder in dryland areas, but also increase the production of small ruminants,” said Dr Umutoni. “I am very happy and proud to be among the winners and this award is an encouragement to work hard and contribute more to agricultural research.”

Talking about the program, she said, “The program itself has raised my awareness on science communication. In the future, I will be able to talk about my research findings to all those who may not be experts, but whose contributions and engagements are important for transforming food systems.”

She expressed her gratitude to the USAID-funded Feed the Future Innovation Lab for Livestock Systems at the University of Florida for inviting her to participate in the program, and Dr Vincent Bado and the project team who supported my participation.” Umutoni concludes.

The award was announced on 16 March via an online event.
ICRISAT scientist featured among 25 global researchers as “Voices of biotech research” by Nature Biotechnology

Nature Biotechnology, the world’s leading biotechnology journal, recently featured Dr Rajeev K Varshney as one of the 25 global researchers in biotechnology answering two important questions: “What will be the most important areas of research in biotech over the coming years?” and “Which technologies will be most important to advance knowledge and applications in these areas?” Dr Varshney, Research Program Director, Genetic Gains, ICRISAT, is the only agricultural scientist among the 25 researchers.

Responding to Nature Biotech’s call “Voices of biotech research” for its 25th Anniversary collection, Dr Varshney highlighted the integration of Machine Learning and Artificial Intelligence with the huge volume of datasets now available to researchers due to the latest genome sequencing tools and platforms. He opined that it would be an exciting area of biotech research for enhancing the accuracy of genomic prediction for accelerated crop improvement programs. The full feature on Voices of biotech research can be accessed here https://doi.org/10.1038/s41587-021-00847-1.

ICRISAT’s Center of Excellence in Genomics & Systems Biology (CEGSB), together with its partners and collaborators, have been leading and advancing genomic research for accelerating crop improvement programs in Asia and sub-Saharan Africa. In this process, while conducting high-quality research ICRISAT’s CEGSB (https://cegsb.icrisat.org/) has published more than 400+ high-quality articles including 15 papers in Nature Journals.
India Post releases picture postcard series to celebrate Hyderabad as a hub for scientific organizations

The Department of Posts, Government of India in Telangana recently paid tribute to the scientific development centered around the city of Hyderabad by launching a special series of picture postcards on “Scientific Research Institutes of Hyderabad.” ICRISAT is among the 10 organizations featured.

Speaking on the occasion, Mr Rajendra Kumar, Chief Postmaster General, Telangana Circle said, “This is a celebration of Hyderabad’s achievements; it is one of the four scientific clusters in India (the others are Pune, Bangalore and New Delhi). Dr Sagar Singh, Postmaster General, said, “Starting in the 1960s we saw several scientific institutions set up headquarters in Hyderabad. Today, we launch this series to make people more aware about these organizations.”

Apart from ICRISAT, other institutions gracing the postcards are the National Institute of Nutrition (NIN), The Central Research Institute for Dryland Agriculture (CRIDA); The National Academy of Agricultural Research Management (NAARM); National Institute of Pharmaceutical Education and Research (NIPER); The Center for Cell & Molecular Biology (CCMB); and more.

Ms Joanna Kane-Potaka, Assistant Director General-External Relations, ICRISAT, applauded India Post’s initiative to highlight these institutions. “This can be a great opportunity for organizations who often work bilaterally, to now collaborate across disciplines and sectors,” she said.

The postcard series was launched on 10 Mar 2021 in Hyderabad.


**Just released**  
**Food Trends in Africa**

**Nestlé's insights to African Food Trends**

Ms Julie Bouedy  
Head – Consumer Sensory Insight and Ideation, Nestlé, Côte d’Ivoire

**Biofortification:**  
**Driving markets for more nutritious food**

Jenny Walton  
Senior Specialist, Demand Creation and Business Development, Harvest Plus, USA

**Towards inclusive and healthy food systems in Africa**

Dr Jemimah M Njuki  
Africa Director, International Food Policy Research Institute, Kenya

**Seeds for resilience**

Rodrigo Barrios  
Food Forever Campaign Manager, Global Crop Diversity Trust, Germany

See [www.smartfood.org/foodtec-conference](http://www.smartfood.org/foodtec-conference)
New publications

Hydrodynamic modeling for identifying flood vulnerability zones in lower Damodar river of eastern India
Authors: Singh RK, Kumar Villuri VG, Pasupuleti S and Nune R
Published: Ain Shams Engineering Journal (TSI), 11 (4). pp. 1035-1046. ISSN 2090-4479
http://oar.icrisat.org/11736/

Diversity and stability studies in barnyard millet (Echinochloa frumentacea (Roxb).Link.) germplasm for grain yield and its contributing traits
Authors: Prabu R, Vanniarajan C, Vetrivanthan M, Gnanamalar RP, Shanmughasundaram R and Ramalingam J
Published: ELECTRONIC JOURNAL OF PLANT BREEDING, 11 (02). pp. 528-537. ISSN 0975-928X
http://oar.icrisat.org/11737/

Genetic diversity analysis of geographically diverse landraces and wild accessions in Sorghum
Authors: Allan V, Geetha S, Vetriventhan M and Azevedo CR
Published: Electronic Journal of Plant Breeding, 11 (3). pp. 760-764. ISSN 0975-928X
http://oar.icrisat.org/11739/

Genetic structure and diversity in Sorghum bicolor (L.) Moench landraces from marginal sorghum production lands in Senegal, based on SSR markers
Authors: Bodian A, Ouattara B, Sarr A, Gano B, Sall MN, Ndir KN, Cissé N and Falalou H
Published: Journal of Plant Breeding and Genetics, 7 (3). pp. 134-144. ISSN 2308-121X
http://oar.icrisat.org/11740/

The Ontologies Community of Practice: A CGIAR Initiative for Big Data in Agrifood Systems
Published: Patterns, 1 (7). p. 100105. ISSN 2666-3899
http://oar.icrisat.org/11741/

Transforming failing smallholder irrigation schemes in Africa: a theory of change
Authors: Pittock J, Bjornlund H and van Rooyen A
Published: International Journal of Water Resources Development (TSI), 36 (S1). S1-S19. ISSN 0790-0627
http://oar.icrisat.org/11742

Enabling Markets, Trade and Policies for Enhancing Sorghum Uptake
Authors: Parthasarathy Rao P, Deevi KC and Birthal PS
http://oar.icrisat.org/11743

Improved Genetic Map Identified Major QTLs for Drought Tolerance- and Iron Deficiency Tolerance-Related Traits in Groundnut
Authors: Pandey MK, Gangurde SS, Sharma V, Pattanashetti SK, Naidu GK, Faye I, Hamidou F, Desmae H, Kane NA, Yuan M, Vadez V, Nigam SN and Varshney RK
Published: Genes (TSI), 12 (1). pp. 1-22. ISSN 2073-4425
http://oar.icrisat.org/11744

Genome sequence and genetic diversity analysis of an under-domesticated orphan crop, white fonio (Digitaria exilis)
Authors: Wang X, Chen S, Ma X, Yssel AEJ, Chaluvadi SR, Johnson MS, Gangashetty P, Hamidou F, Sanogo MD, Zwaenepoel A, Wallace J, de Peer Y, Bennetzen JL and Van Deyne A
Published: GigaScience (TSI), 10 (3). pp. 1-11. ISSN 2047-217X
http://oar.icrisat.org/11745

Modeling Illustrates That Genomic Selection Provides New Opportunities for Intercrop Breeding
Authors: Bančič J, Werner CR, Gaynor RC, Gorjanc G, Odeny DA, Ojulong HF, Dawson IK, Hoad SP and Hickey JM
Published: Frontiers in Plant Science (TSI), 12. pp. 1-16. ISSN 1664-462X
http://oar.icrisat.org/11726/

In vivo digestibility of six selected fodder species by goats in northern Ghana
Authors: Avoronyo FK, Partey ST, Zougmore RB, Asare S, Agbolosu AA, Akufi NM, Sowah AA and Konlan SP
Published: Tropical Animal Health and Production (TSI), 52 (2). pp. 473-480. ISSN 0049-4747
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Genome-Wide DArTSeq Genotyping and Phenotypic Based Assessment of Within and Among Accessions Diversity and Effective Sample Size in the Diverse Sorghum, Pearl Millet, and Pigeonpea Landraces
Large-plot based performance evaluation of pigeon pea (Cajanus cajan L. Millsp.) Varieties for grain yield and agronomic traits under irrigation condition in Mandura District, North-West, Ethiopia

Authors: Yimer Z, Yaregal W, Fikre A, Degefu T and Rao G
Published: International Journal of Research in Agronomy, 3 (1). pp. 8-12. ISSN 2618-060X
http://oar.icrisat.org/11729/

Evaluation of fodder yield and fodder quality in sorghum and its interaction with grain yield under different water availability regimes

Authors: Somegowda VK, Vemula AK, Naravula J, Prasad G, Rayaprolu L, Rathore A, Blümme M and Deshpande SP
Published: Current Plant Biology (TSI), 25. p. 100191. ISSN 2214-6628
http://oar.icrisat.org/11730/

On-Farm Evaluation on Yield and Economic Performance of Cereal-Cowpea Intercropping to Support the Smallholder Farming System in the Soudano-Sahelian Zone of Mali

Authors: Sogoba B, Traoré B, Safia A, Samaké OB, Dembélé G, Diallo S, Kaboré R, Benié GB, Zougmoré RB and Goïta K
Published: Agriculture (TSI), 10 (6). pp. 1-15. ISSN 2077-0472
http://oar.icrisat.org/11731/

Examining the Gender Productivity Gap among Farm Households in Mali

Authors: Singbo A, Njuguna-Mungai E, Yila JO, Sissoko K and Tabo R
Published: Journal of African Economies (TSI). pp. 1-34. ISSN 0963-8024
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Differential household vulnerability to climatic and non-climatic stressors in semi-arid areas of Mali, West Africa

Authors: Segnon AC, Totin E, Zougmoré RB, Lokossou JC, Thompson-Hall M, Ofori BO, Achigan-Dako EG and Gordon C
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