Newly launched millet food finder shows a revolution is underway

Millets have sometimes been hailed as the next quinoa but researchers collating a global database of millet products have found this ancient grain to be orchestrating a silent food revolution that could see quinoa outstripped. The “Millet Finder”, launched today, discovered a surge in the use of millets, with over a thousand modern convenient products being marketed and sold across all the inhabited continents.

Launched at the FoodTec Expo by ICRISAT and the Indian Institute of Millets Research of the Indian Council of Agricultural Research (ICAR-IIMR), the “Millet Finder” will help users find over 500 products across 30 countries. Another 500 products are identified and set to be included and mapped by end of the year by the Smart Food team at ICRISAT, who created the database and will continue growing it.

“Unless there is a consumer-driven demand and movement to diversify diets, farms cannot diversify and agriculture cannot be sustainable. By diversifying staples, we can have a major impact on diets, farms and the environment. ICRISAT strongly believes in creating awareness and helping consumers make informed choices while keeping their health and the environment in view. In that respect, millets check every box,” said Dr Jacqueline d’Arros Hughes, Director General, ICRISAT, and Chair, Smart Food Executive Council.

FoodTec Expo, an event supported by the Kenya Ministry of Agriculture, Livestock, Fisheries and Cooperatives, included a conference this year with a strong focus on supporting industries and value chains like millets, with a Smart Food bottom line – Good for you, planet and farmer.

“Millets are a traditional food across Africa and Asia, largely consumed in their natural forms. Increasing awareness of millets and their health benefits is helping fuel their return to plates and expansion of farms. In Africa, as with many other regions, their resilience will be our lifeline to cope with climate change,” emphasized Dr Yemi Akinbamiyo, Executive Director, Forum for Agricultural Research in Africa (FARA).

Their versatility in how they can be eaten is another major factor impacting the massive product growth. Millets can be cooked like rice (so a “smart” rice) and are a crop finding use in gluten-free bakery products from pancakes to muffins, pasta, popped as a snack, flakes in a muesli, as a porridge, a hot drink, smoothies, soup and a wide range of savory dishes. Millet Finder shows the possibilities are endless.

“We have compiled this product database from scratch. We also plan to automate this database using artificial intelligence and make information accessible through an interactive app which can help anyone in the world find the closest shop or restaurant selling millets, compare products, check out ingredients and much more,” said Ms Parkavi Kumar, lead creator of Millet Finder and Senior Communication Officer, Smart Food initiative, ICRISAT.
**Going the millet way**

Millets, including sorghum, are Smart Food because they are highly nutritious, environmentally sustainable and resilient to climate change effects while having immense potential for further development. The ICAR-IIMR, ICRISAT and the Smart Food initiative have been working with governments, social cause organizations and the private industry to create awareness of the benefits of consuming millets and cultivating them.

“India has been leading the world with the largest range of millet products, driven partly by government awareness programs to consumers, industry, farmers and also to its own government departments. The need for more nutritious foods and resilient crops that can cope with climate change have been some key reasons behind the government programs,” Dr Vilas Tonapi, Director, ICAR-IIMR, said after launching the database.

“Millets fulfill almost all nutrition and health needs. Many have very high iron and zinc. Considering how much is absorbed (bioavailability), they can often provide the same amount of iron as white or red meat. They are gluten-free and with low glycemic index of the whole grain, good for managing or controlling diabetes. Finger millet has three times the calcium in milk. Millets have reasonable protein levels and can complement legumes to create a complete protein. They are also high in fiber and can be good for losing weight,” Dr Anitha Seetha, Senior Scientist-Nutrition, ICRISAT.

**Preparing ground for the International Year of Millet**

The year 2023 is likely to be designated the International Year of Millet by the UN, already approved by the UN Food and Agriculture Organization. The designation is expected to be the tipping point for millets to reach masses and make them a part of everyday diets across the world. Millet Finder is well poised to excite industry and consumers alike.

ICRISAT’s iHub platform was recently highlighted in the Food & Business Knowledge Platform for its role as a connector – an innovation broker – between technology innovators, the private sector and other stakeholders. Mr Ram Dhulipala of iHub speaks to Dr Sarah Cummings of Wageningen University and Research on the importance of public-private partnerships, especially in the context of One CGIAR.

The International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) is an international, public sector research centre, part of the CGIAR network, based in Hyderabad, India. ICRISAT’s Digital Agriculture program, which has received considerable support from senior management, is a self-sufficient research program with a radical approach. In this program, ICRISAT plays the role of innovation broker, linking farmers with public-private partnerships (PPPs) and tech startups. ICRISAT has focused on digital agriculture since 2015 with a formal Digital Agriculture program since 2016.

The Digital Agriculture team launched the iHub, namely the innovation hub for agritech entrepreneurs, in February 2017. The iHub is an innovation broker that creates partnerships between technology innovators and ICRISAT research programs. The iHub plays a critical role in strengthening connections between researchers and the private sector by encouraging tech startups to reconceive their products for the agriculture sector.

Digital tools like Plantix and Kalgudi create two-way information flows between researchers and farmers, increasing transparency. Ram Dhulipala is Theme Leader, Digital Agriculture & Youth, and is research leader of the iHub incubator. On Friday 16 October 2020, Ram Dhulipala was interviewed to try to understand ICRISAT’s interaction with the private sector. Initially, I asked about the main lessons of working with the private sector and to what extent these lessons are potentially applicable to other CGIAR institutes and programs.

Ram Dhulipala considers that there needs to be a conscious effort to take the private sector on board within the CGIAR and that this involves a programmatic approach, rather than an ad hoc one. This is one of the lessons that ICRISAT has learned and it is a useful experience for other CGIAR centres who have not yet done this. Although there are some useful activities by the CGIAR, for example the Big Data community of practice, in reality behavior change takes more than annual meetings.

Ram Dhulipala explains that cultural change is needed within the CGIAR because, at the moment, there is a tendency to ‘look down’ on the private sector. He argues that although the private sector is driven to seek profit, it still needs to create value so in that sense it is not so far away from the CGIAR itself: ‘Working with the private sector takes practice and experience, and we need to learn from each other in the ways to go about it. In particular, working with the private sector needs soft skills of managing partnerships and relationships between tech companies and CGIAR researchers.’

Ram Dhulipala explains that one of the problems of working with the private sector is that digital agriculture startups tend to be very technology-minded: ‘Tech startups need to fall in love with the problem and not with the solution. In my experience, some of the tech multinationals have the tendency to create the solution and then find the problem, forcing the solution on others.’ Read more...
LeanCrop Technology Solution Pvt Ltd (BharatAgri), an agtech start-up incubatee with the Agri-Business Incubator (ABI) of ICRISAT, has raised US$ 2 million in pre-Series A funding from 021 Capital and India Quotient.

“This round of funding will be used to further enhance product features and scale up operations to newer states in India. Our unique product offering has been well accepted by farmers on a large scale. We are among the few agri-tech companies in India that have been able to monetize advisory at scale, that too digitally, with over 43,000 farmers using our premium service package,” said Mr Siddharth Dialani, CEO and Co-Founder of BharatAgri.

Founded in 2017 by Ms Sai Gole and Mr Dialani, alumni of the Indian Institute of Technology-Madras, BharatAgri offers farmers season-long plans that are customized to the crop and field conditions to improve farm yield and quality of produce. The plans include real-time actionable insights that cater to weather-related changes during the season, backed by data science and real-time monitoring using satellite imaging.

“It is heartening news when agtech start-ups win investor trust. Farmers and agriculture in the drylands need all the support they can get and organizations like BharatAgri have a critical role to play. Such developments attract youth to agriculture to solve problems, bridge gaps and create opportunities to increase incomes and improve livelihoods,” said Dr Jacqueline d’Arros Hughes, Director General, ICRISAT.

BharatAgri has a user base of over 400,000 farmers in the Indian states of Maharashtra and Madhya Pradesh. It offers both free and premium paid services. Besides advisories, premium users get annual soil and water quality checks. The users can use BharatAgri to connect with the market and access other value chain essentials like inputs, machinery, insurance, etc. In terms of impact, farmers have seen over a 40% increase in yield and a significant reduction in costs, the organization claims.

“ABI-ICRISAT accepted us in 2017 into their program and we got very good support from their team in research work guidance, access to facilities for experiments, and our discussions on various issues and ideas ranging from revenue model to field trials that helped to grow the company,” Mr Dialani said. ABI-ICRISAT was also the incubation partner for BharatAgri when it was selected for the Biotechnology Ignition Grant (BIG) of Biotechnology Industrial Research & Action Council (BIRAC). Dr Harikishan Sudini was the scientist-mentor from ICRISAT for this project that involved the development of algorithms for pest and disease detection in groundnut.

The robustness of the start-up’s model was proven when the organization emerged from challenges in the initial weeks of COVID-19 lockdown with digital campaigns to help farmers with harvesting schedules and connect them to leading farm-to-market companies. Its 21 Jugaad (21 Smart Tips) to fight pests and nutrient deficiencies using home remedies and live Shetishalas (agri-school) on the BharatAgri app helped keep operations running while supporting farmers in preparing for Kharif 2020. The efforts resulted in an increase in premium subscriptions during the period.

“We are very happy for the BharatAgri team. It has been phenomenal to see their growth since inception. This is a testament to their business model and trust established with farmers. We will continue to support BharatAgri in their scaling-up journey to equip smallholder farmers with tools and knowledge to address various challenges in the sector and beyond,” said Dr Kiran K Sharma, Head of ABI-ICRISAT and Deputy Director General-Research, ICRISAT.

021 Capital is backed by noted entrepreneur Mr Binny Bansal. BharatAgri’s existing investors Better Capital and Mr Ajay Prabhu (COO, Quest Global) also participated in this funding round.

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This work contributes to UN Sustainable Development Goals
Environment Minister launches women-owned food processing unit in Telangana

ICRISAT-led project transforms tribal women into first-generation entrepreneurs by helping them produce healthy, nutritious foods from dryland crops.

Mr Allola Indrakaran Reddy, Minister for Endowment, Law, Forest and Environment, Telangana, recently inaugurated a food processing unit owned and run by women, in Utnoor, Telangana. The Komaram Bheem Peanut Chikki Industries that the minister opened is wholly owned by first-generation tribal entrepreneurs. The unit will supply to government nutrition programs and anganwadis in the tribal region.

This food processing unit is part of a successful collaboration between the Tribal Cooperative Finance Corporation Limited (TRICOR), Tribal Welfare Department of Telangana State, Government of India’s Ministry of Tribal Affairs and ICRISAT’s Agribusiness and Innovation Platform (AIP). This collaboration aims to localize production and address malnutrition, besides improving economic conditions of tribal communities.

“I am delighted to inaugurate the Komaram Bheem Peanut Chikki Industries in Utnoor today. This unit is a testament to Telangana government’s commitment to development and welfare of tribal populations in the state. That the unit is owned and run by women is another reason for celebration,” the minister said.

The food processing unit is designed and equipped with machinery as per Food Safety and Standards Authority of India (FSSAI) guidelines. It will ensure production of nutritious food products meeting national and international market standards. ICRISAT has trained 80 tribal women farmers from Utnoor, Etturnagaram and Bhadrachalam in Telangana to manage food processing units that are being set up in these blocks.

The training covered food safety management systems, machine operations and maintenance, and quality control. The women will produce hygienically packed, safe and nutritious foods for their communities. ICRISAT has enabled the women to form Joint Liability Groups (JLGs) to manage the food processing units.

“This is a great example of the values that form the basis of ICRISAT’s work - empowering women and the less privileged. Such success is only possible through partnership, and working with the Department of Tribal Welfare has been a wonderful opportunity and their leadership is greatly appreciated,” said Dr Jacqueline d’Arros Hughes, Director General, ICRISAT.

This project brings together key aspects of ICRISAT’s mandate: nutrition, food safety, sustainable small businesses and gender equity. The project has leveraged locally available dryland crops to create healthy value-added Smart Food products that promote dietary diversity and in the long run address malnutrition in vulnerable communities.

“ICRISAT will continue to support the project towards sustainably scaling up this unique initiative to promote economic independence of tribal women and ensuring the nutritional security of their communities,” said Dr Kiran K Sharma, Deputy Director General-Research, ICRISAT.

The project trains tribal women to be “Nutrition Entrepreneurs” and is critical to ensure evolution of local value chains around local food production and consumption to make vulnerable tribal communities sustainable, especially post COVID-19. Going forward, this initiative will empower tribal communities by establishing more units and build their capacity to run the units in a sustainable manner, contributing towards not only health and nutrition, but sustainable livelihoods as well.

Project: Setting up of eight processing units in ITDAs of Utnoor, Etturnagaram and Bhadrachalam through Joint Liability Groups (JLGs) of Telangana.

Partners: Integrated Tribal Development Agencies, Tribal Women-led Joint Liability Groups, Girijan Cooperative Society, Anganwadis (Ministry of Women and Child Development) and ICRISAT

Funders: Department of Tribal Welfare, Government of Telangana

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

This work contributes to UN Sustainable Development Goals
A harmonized regulatory landscape for new breeding technologies need of the hour

Researchers and policy specialists from across the world called for a uniform enabling regulation to use new breeding technologies (NBTs) effectively. They were speaking during the fourth and fifth webinars of One CGIAR Global Webinar Series on Genome Editing in Agriculture.

Regulation and genome-edited plants

Dr Donald Mackenzie, Executive Director at the Institute for International Crop Improvement at Donald Danforth Plant Science Center, US, said that all plant breeding methods can cause unintended effects, some with a higher likelihood than others, but there is no hazard that is unique to methods that move genes between unrelated organisms. “The assessment of risks should be based on the product and not the method by which it is produced,” he said, adding that Canada was the first country where regulation was triggered by the nature of the product.

Dr Mackenzie also briefly discussed the new changes to biotechnology regulation that the US Department of Agriculture’s Animal and Plant Health Inspection Service (APHIS) introduced this year. These changes are popularly referred to as the SECURE rule.

“It makes three important exemptions. Specifically exempted are those gene-edited products that are categorized SDN 1, SDN 2 and those with genes that are known to occur in a plant’s genepool or an allele replacement,” he added. SDNs (site-directed nucleases) are enzymes that cleave DNA. They have also lent their name to the three broad types of gene-editing processes. SDN 1 and SDN 2 edits do not involve foreign DNA while SDN 3 edits involve addition of new genetic material.

Dr Hugo Campos, Research Director at CIP, argued that gene-editing products produced by SDN 1 and SDN 2 edits should not require additional regulatory oversight compared to regular breeding lines. “The mutations in them are identical to either naturally occurring mutations or those that are produced by mutagenesis and are not novel genetic combinations,” he said.

“Only SDN 3 should be regulated as a GMO,” he added while showing a list of about 10 countries that already regulate SDN 1 and SDN 2 gene-edited crops as regular breeding lines. The European Union, however, regulates all gene-edited crops as GMOs (Genetically Modified Organisms).

Dr Judith Chambers, Director, Program for Biosafety Systems (PBS), IFPRI, presented findings from the program’s recent study that analyzed the global genome editing landscape. The exercise had revealed that much of the work in genome editing was still in early stages. The private sector is active and is sharing technologies for public good, and the work in crops, with great diversity, dominates the scene while work in livestock is mainly in the realm of disease control.

The analysis of biosafety laws across countries revealed the differences in definitions of what constitutes a GMO. A narrow definition that some countries like Ethiopia have implemented excludes most gene-editing applications while a broad definition that countries like Ghana have adopted includes most applications. On the other hand, some countries, Nigeria for instance, have definitions that may include genome editing but offer flexibility to design different regulatory pathways, Dr Chambers said.

“Our recommendation on regulation is to think from a global to a local perspective. What is going to help establish a science-based oversight around this technology? It is going to be very important to facilitate South-South relationships, and to track the international agreements space,” she said.
Presenting country case studies, Dr Agustina Whelan described the first case study of waxy corn obtained by CRISPR-Cas for which non-regulated status has been allotted by the Argentina National Advisory Commission on Agricultural Biosafety, since it does not contain a new combination of genetic material in the final product.

Speaking about regulations in India, Dr Vibha Ahuja, Chief General Manager, Biotech Consortium India Limited, said ‘genetic engineering’ was defined when rules were introduced in 1989 in India. Under the term genetic engineering, all applications including insertion of foreign ‘heritable material’ into a cell, are included.

“No product of gene editing has been commercialized so far but research in its application is underway in healthcare and agriculture,” she said.

Dr Ahuja also informed that working with SDN 1 edits in plants requires Biosafety Level 1 facilities in India while SDN 2 and SDN 3 gene-edited plants would require Biosafety Level 2. Early this year in India, a draft document ‘Regulatory Framework and Guidelines for Risk Assessment of Genome Edited Organisms’ was opened to public comments.

Providing an overview of genome editing regulations in Kenya, Prof Dorigington Ogoyi, Chief Executive Officer, Kenya National Biosafety Authority (KNBA), said there is no specific law for gene-editing technologies in Kenya. Four applications of genome-editing projects in plants and two in animals have been approved by KNBA.

“SDN 1 and SDN 2 will not be regulated under the provisions of the Biosafety Act but will need approval from other agencies,” he said. For applications intending to use genome editing, one will have to apply to the NBA that will inform whether the application will be regulated under the Biosafety Act.

Dr Flerida Carino, member of the Department of Science and Technology, Biosafety Committee, Philippines, presented the status of the recently issued national regulations and draft resolution from the committee. The draft resolution is an explicit policy shift – from a process-based risk assessment and regulation to a product-based risk assessment and regulation system.

She reiterated, “It’s a huge distance from the original mechanisms or the original approach that we do for risk assessment of products of modern biotechnology.”

Describing the decision tree of regulation, she mentioned that since SDN 1 and SDN 2 category of gene-edited plant products do not have insertion of genes from non-sexually compatible species or any introduction of a gene bred out of the system, they are deemed to have no novel genetic combinations and would be exempted from GM regulations.

Pathways to commercialization

Citing India, Dr Trilochan Mohapatra, Director General, Indian Council of Agricultural Research (ICAR), spoke about how research from public sector research systems reaches the farmers in India. “The Indian breeding system is elaborate and more than 50 different crops important for agriculture are handled. The best material from both private and public sector is compared and then gets notified in the Indian system,” he said.

Dr Mohapatra also informed that the guidelines for gene editing are being finalized in India. In the context of public-private engagement, he said there is scope for public and private institutes, including small and medium enterprises, to collaborate in using new breeding technologies, as they have been doing thus far with existing technologies.

Dr Mark Rosegrant, Research Fellow Emeritus, IFPRI, said that strong enabling policies are needed for genome editing and other agricultural R&D. Even if favorable, weak policies do not create positive outcomes for research. He explained how the political economy can inhibit adoption of new technologies. He called for a policy environment that enables science and innovation through legal framework for resource rights; regulations to encourage scientific inquiry and exchange; and markets and trade regimes that are open, transparent and fair.

Dr Peter Thygesen, Principal Regulatory Scientist, Office of the Gene Technology Regulatory, Australia, and Chair (Elect), OECD Working Group on the Harmonization of Regulatory Oversight in Biotechnology, listed past and current areas of work in biotechnology for his working group that include sorghum, cowpea, cassava and banana. Since 2014, he informed, the group has been sharing information on experiences with risk assessment and regulation of new plant breeding technologies, specifically genome editing.

Giving a ringside view of discussions in multilateral fora, Ms Sarah Lukie, Managing Director for Regulatory and Multilateral Affairs, Plant Biotechnology, at CropLife International, informed that gene editing is a priority within ‘synthetic biology’ for parties to the Convention of Biodiversity, the overarching treaty that has 196 countries as parties to it.

“There is a general agreement in this forum that many types of applications of synthetic biology may be subject to the biosafety protocol,” she said referring to Cartagena Biosafety Protocol that is a subsidiary to the Convention of Biological Diversity (CBD).

Dr Morven McLean, Chief Executive Officer, Agriculture & Food Systems Institute, emphasized that it is
important to address regulatory asymmetries as they would affect trade. She said harmonization can be aided by aligning definitions, standardizing information needed to decide if a gene-edited plant will be subject to additional regulation, timelines for making determinations and recognizing decisions made by other countries.

For practitioners and developers of gene-edited products, Dr McLean said, awareness of regulatory landscape and how a product moves through commerce, including exports, is essential. “There is emerging consensus on SDN 1 and SDN 2 but there are some jurisdictions like European Union where gene-edited plants are considered GMO,” she added.

Dr McLean also said that CGIAR, through its centers and large number of partnerships, has a very important role to play in this harmonization.

Dr Ian Barker, who leads the Global Potato Agri-Food System Program at CIP, said that the seed systems for gene-edited crops are likely to evolve and behave as seed systems for existing breeding technologies do. There could, however, be some specific direct and indirect consequences for seed movement, like in labelling for gene-edited crops, in deregulated environments; then they could be very different from existing seed systems, he added.

That notwithstanding, he called for continued investments to improve seed systems, engagement and capacity building to deliver seeds to smallholder farmers to utilize the potential of new breeding technologies.

Stressing the policy position of the American Seed Trade Association (ASTA) on new breeding technologies, Dr Fan-Li Chou, Vice President, Scientific Affairs and Policy, said that plant varieties produced by NBTs should not be differently regulated if they are indistinguishable from varieties produced through earlier breeding methods. She advocated a ‘technology-neutral’ approach for the seed industry keeping in view the needs of farmers, retailers and consumers.

“Consumers want safe and healthy food for their families, and want farmers to grow that food while conserving natural resources and reducing crop inputs,” she said, emphasizing the need for plant breeding and seed production communities to engage with the wider community.
A circular approach to agriculture is key to sustainable development, say experts

Professionals from research, philanthropy and business agreed that ‘circular’ systems for agriculture and food production – where materials are looped back into the process with minimal waste generation – should become the norm to sustainably improve food security and preserve biodiversity. Incentivizing farmers and food processors, creating enabling policies and boosting investments in this direction, are some of the ways of achieving this.

Linear food systems are shown to cause environmental degradation, increased wastage and reduced profitability. On the other hand, circular practices ‘close the loop’ of materials used, reducing consumption as well as emissions in production and distribution of food.

At a virtual panel discussion, ‘Agriculture and food: The Road ahead is Circular’, Dr Jacqueline Hughes, Director General, ICRISAT, and other experts discussed ways to attain circularity in agriculture and food. Dr Shirish Sinha, Director-Climate, Children’s Investment Fund Foundation, was the panel coordinator.

Efforts towards circularity

“At ICRISAT, our work has always been circular in nature,” said Dr Hughes. “Beginning with the science (increasing genetic gains) for higher productivity of our crops, and moving towards better nutrition (dietary quality and diversity), and further towards preventing land degradation (through climate resilient crops and practices that put nutrition back in the soil), we are constantly aiming towards a closed loop of resources and energies.”

Ms Betty Kibaara, Director, Rockefeller Foundation, described the efforts of her organization in Kenya to generate the interest of investors and innovators in novel food concepts, e.g. black soldier fly as an affordable and accessible protein source. She said that technical assistance was needed to develop and scale up the production of this food.

Mr Rajneesh Kumar, SVP and Chief Corporate Affairs Officer, Flipkart Group, shared insights from the e-commerce perspective on reducing wastage, adopting ‘greener’ operations and creating more opportunities for small and medium businesses on the Flipkart platform. He admitted that e-commerce in India was still at a nascent stage and was yet to develop a full-fledged plan for circularity in its design.

Discussing the share of responsibility of ensuring circularity, Dr Hughes suggested that in agriculture, those with greater capacities to take risk and bear the opportunity costs should take up a bigger responsibility towards circularity, so as to minimize risk for those who can least afford them.

Minding the gaps

“We need market demand at all points within the circularity,” said Dr Hughes, highlighting the importance of a market-driven approach. “If we could add value to a product by way of branding or certification as a proof of circularity, that would encourage the producer to move towards a more circular production, because it would increase the selling price.”

Ms Kibaara listed two opportunities or gaps that could be harnessed to bring more circularity in her region of work: technological advances and enabling policies. “Can we create a ‘smart’ market for affordable, renewable energy? How do we scale up technology and develop business models in these areas... solar energy for processing, rainwater harvesting etc.? We urgently need enabling government policies to facilitate these,” she said.

“Information is key,” said Dr Hughes. “Right from the farmers in the field, to scientists in the laboratory, we all have information, but we need to share it freely so as to maximize impact. Information sharing can empower women farmers to make the best decisions; information from farmers about their environments can help researchers develop more resilient/productive crop varieties; market demand information can help marginal farmers make the most of their produce.”

Role of development platforms

When asked about the contribution of development platforms such as Transform Rural India in boosting circularity in agriculture, Dr Hughes said that they could play a very strong coordinating role among various stakeholders. “Such platforms can ensure that partners, stakeholders, etc. are on the same level playing field. This can facilitate partnership and knowledge exchange,” she said. “A platform like that can also provide quantifiable goals that partners and stakeholders can contribute, to substantiate that that circularity actually works.”

In general, the participants of the discussion expressed satisfaction over the fact that the idea of circularity was given visibility and that the discussion had yielded some tangible points to put into practice by the agencies involved and their partners.

The webinar, held on 5 November 2020, was part of the Sankalp Forum 12th Global Summit, an initiative by Intellecap.
Use of scientific evidence for greater partnerships and better policies

Discussion sessions with Nigerian Agriculture Minister

Surveys on agricultural technology adoption in Nigeria carried out in 2019-2020 revealed gains made in crop yields, gross margins and ROI, as well as challenges in accessing improved seeds. One of the suggestions made on the basis of these results was that ICRISAT develop appropriate policy briefs for use by the Federal Ministry of Agriculture and Rural Development (FMARD Nigeria) and agricultural sector partners for value chains and markets of millets, sorghum and groundnut. The detailed results of the surveys were discussed recently with government officials and NARS partners in Nigeria in two sessions designed to provide them with updated evidence to be considered while formulating agricultural policies.

Surveys on adoption of varietal and non-varietal technologies and their impacts and value chain analyses of the ICRISAT mandate crops in Nigeria have been ongoing in selected states of Northern Nigeria since 2019. In addition to testing survey tools for the collection of digitized gender-disaggregated data within the framework of the implementation of the HOPE 2/AVISA projects, outcomes of these surveys constitute data-driven sources for breeding, seed systems and policy formulation at both State and Federal levels in Nigeria.

Members discussed outcomes of adoption and welfare impact studies of groundnut, sorghum and pearl millet; value chain analyses of these crops; and youth engagement in the agri-food system in Nigeria.

- Pearl millet: Awareness of improved varieties was 28%, resulting in an adoption rate of 18%, compared to a potential adoption rate of 45%.

- Sorghum: Adoption rate of improved varieties was 25%.

- Pearl millet: ROI was higher for farmers who adopted improved technologies (83%) than for those who did not (43%).

- Germination potential, pest/disease resistance, size, color and market price were identified as key traits by actors of sorghum, groundnut and pearl millet value chains.

- Many locally processed products of these crops are frequently placed on local markets with demand increasing for each product: e.g. Fura (dough balls)

“Concrete outcomes of research are indispensable tools in sourcing funds for agricultural research”, – Mr Manir Babba Dan’agundi, Chairman of Parliamentary Committee on Agriculture Colleges and Institutions.
• from pearl millet, Kuli-Kuli (cake) from groundnut and flour from sorghum.
• Margins for value chain actors range from 8% for market-based retailers to 29% for small-scale neighborhood retailers.
• Except in the processing/distribution segment, all other segments of the groundnut, pearl millet and sorghum value chains are dominated by men.

“There is enormous potential in developing capacities of actors of each value chain and ensuring adequate governance in all the three value chains,” said Dr Vabi. “Information flow is the key aspect of ensuring value chain linkages and improving governance.”

Dr Jummai Yila, Gender Scientist, ICRISAT-WCA, revealed unexploited employment opportunities for youths across the sorghum, pearl millet and groundnut value chains.

The opening session was presided over by Mr Alhaji Sabo Nanono, Minister of Agriculture and Rural Development, Nigeria. In his opening remarks, the Minister acknowledged the long-term role that ICRISAT has played in ensuring availability of quality seeds of groundnut, sorghum and pearl millet in Nigeria. The Minister recounted, “ICRISAT has succeeded in supporting the development of several sorghum and groundnut varieties in Nigeria; varieties which combine early growth and resistance to many diseases/pests.” He then challenged ICRISAT to go beyond the stimulation of downstream sectors of crop value chains to support processing in order to ensure food and nutrition security of Nigerians. In order to achieve this, he encouraged ICRISAT and agricultural sector partners to link crop production with industry. He also underlined the need to move beyond small-scale group processors, and work towards generating employment for youth as 70% of them remain unemployed in Nigeria.

The first technical debriefing and validation session was held in Kano during 5-6 November 2020, and the second in Abuja on 10 November 2020. Participants of the sessions were representatives of agricultural research, extension and seed regulatory agencies supervised by the FMARD as well as research-for-development partners in Nigeria. The meetings highlighted the need to revitalize the technical coordinating role of the FMARD and search for alternative strategies to sustain synergies among partners.

Dr Michael Boboh Vabi
Socio-economist/M&E Scientist, AVISA Project
ICRISAT-WCA

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Project: Accelerated Varietal Improvement and Seed Delivery of Legumes and Cereals (AVISA)
Partners: Institute for Agricultural Research (IAR), Nigeria; Centre for Dryland Agriculture (CDA) Bayero University Kano; Lake Chad Research Institute Maiduguri; National Agriculture Extension Research and Liaison Services (NAERLS); Syngenta Foundation for Sustainable Agriculture (SFSA); and ICRISAT
Funder: Bill & Melinda Gates Foundation
CGIAR Research program: Grain Legumes and Drylands Cereals
New study: CGIAR innovations reach nearly 80% of Ethiopia’s rural households

A new independent study published last month has documented the extensive reach of CGIAR-related agricultural innovations in Ethiopia over the past 20 years. The study represents the culmination of years of work by the independent CGIAR Standing Panel on Impact Assessment (SPIA)[1], together with the Ethiopian Central Statistics Agency (CSA) and the World Bank Living Standards Measurement Study (LSMS) team, to develop and test a country-level approach to assessing adoption and diffusion of agricultural innovations using national surveys.

Piloting this new approach for the first time in Ethiopia, a CGIAR research hotspot, the study finds that a sample of CGIAR-related agricultural innovations have potentially reached 11 million rural Ethiopian households — nearly 80 percent of all rural households in the country — with substantial adoption among poor smallholders, women and youth.

To document the reach of CGIAR-related innovations, SPIA started with a stocktake of all such innovations disseminated in Ethiopia in the period 1999–2019.

Consultations with CGIAR and national stakeholders revealed 52 different innovations across the domains of animal agriculture, crop germplasm improvement, and natural resource management (NRM), and 26 instances of policy influence. Working with partners LSMS and CSA, 18 shortlisted innovations were integrated into nationally representative household surveys in 2016 and 2019, which were then used to track uptake.

**CGIAR’s significant contribution to Ethiopia’s agricultural development**

CGIAR innovations have reached between 4.1 and 11 million Ethiopian households, the study found, evidence of CGIAR’s broad contribution to Ethiopia’s agricultural development. The importance of CGIAR research for increased agricultural productivity in Ethiopia is apparent, and with agriculture being one of the main drivers of the country’s economic growth over the past decade, it can be inferred that these productivity gains have contributed not just to food security, but also to broader poverty alleviation.
According to the study, three sets of innovations with a large reach stand out as examples of successful scaling: 1) **soil and water conservation practices**, 2) **improved maize varieties**, and 3) **crossbred poultry**. Soil and water conservation practices, such as terracing on sloped agricultural land, were observed to have been adopted by more than 9.4 million households. DNA fingerprinting data revealed that CGIAR-derived maize germplasm is being used by an estimated 4 million households (63 percent of all maize-cultivating households), while crossbred poultry was reported to have reached an estimated 1.8 million households. All three cases, the study notes, underscore the important role of complementary interventions in reaching scale.

**Illuminating pathways to impact**

The study also concludes that CGIAR innovations are reaching their intended beneficiaries, including smallholders, poor households, young farmers and female farmers. The approach of using national surveys allowed researchers involved in the study to paint a more complete picture of innovation diffusion and adoption, using socioeconomic data collected to better understand where innovations have scaled, for whom, and under what circumstances. The full suite of evidence points to adoption of the innovations across different regions in Ethiopia by a wide range of types of households (in terms of farm size, market access, socioeconomic status, gender and age).

Beyond assessing the scope and scale of CGIAR’s reach, the new approach sheds light on pathways to impact that can be further studied and built on. Though the adoption of innovations is inherently context-specific, understanding the factors that influence the scale and speed of adoption will help CGIAR researchers to ensure that a greater number of innovations reach a large number of households, quickly. CGIAR looks forward to learning from the extension of this valuable work to other countries in the near future.

**Read the study:** Shining a Brighter Light: Comprehensive Evidence on Adoption and Diffusion of CGIAR-Related Innovations in Ethiopia (full report, 2-pager)

ICRISAT’s work in natural resource management in Ethiopia have benefited tens of thousands with better food security, water availability and livestock quality. Please see links below for a comprehensive look at the watershed work in several regions in the country.

- **Case of the Afar Region in Ethiopia: The lone green patch on a denuded stretch**
- **Flooding events turned into farming opportunities**
- **Restore land to sustain life: Inspiration from Yewol for all of us**
- **Managing acid soils for reclaiming livelihoods in Ethiopia**
- **Feeding degraded soils in Ethiopia to feed the people and the environment**
More vigilance, regional cooperation needed to check emerging plant health threats

Locusts, Fall armyworm, wheat blast, banana Fusarium wilt Tropical Race 4 and UG99 - a virulent strain of wheat stem rust, are some of the emerging crop health threats that require to be addressed efficiently to safeguard food security. This was emphasized by representatives of germplasm health units in CGIAR and its partner organizations during a week-long series of webinars to observe this year’s Phytosanitary Awareness Week.

The importance of robust phytosanitary measures was made apparent through demonstrations of the large exchange of material (both import and export) across the world during the Asia webinar on 10 November. Moderated by Dr Rajan Sharma, Head of ICRISAT’s Plant Quarantine Unit, it focused on phytosanitary implications of global exchange of crop germplasm and emerging crop pests and pathogens in Asia.

“Minor pests and diseases are becoming important due to climate change,” said Dr Safaa Kumari, Head of ICARDA’s Seed Health Lab, while listing some challenges to germplasm movement. ICARDA exchanged 115,898 accessions of wheat, barley, chickpea and lentil last year alone.

Enumerating seed-borne pests in wheat, barley and legumes that can be tackled effectively with quarantine, Dr Kumari said seed-borne pests may result in germination loss, reduced seed size, discoloration and shriveling besides spread of pathogen to new areas. She explained that management of seed-borne pests can be done through a multi-pronged approach of seed health testing, control during crop production, chemical control and through phytosanitary measures like quarantine to prevent and control spread.

Dr Rola El Amil, Plant Pathologist at the Lebanese Agricultural Research Institute, said the institute’s Plant Protection Department is monitoring emerging diseases like bacterial brown rot and ring rot in potato, the Plum Pox virus and Xylella fastidiosa among others. She also informed that Tuta absoluta has been a major pest in tomato and efforts underway to control them include identification of new peptides that can prove effective in glasshouses.

In the recent past, the weed Solanum elangnifolium was observed in the region but eradicated after it was spotted, Dr Amil mentioned.

Speaking about phytosanitary measures at ICRISAT in India, Dr Sharma emphasized that healthy seed is essential for healthy crop. The identification of new fungicides for seed treatment is an important activity underway at ICRISAT, he explained. ICRISAT PQU has so far facilitated export of 1.34 million seed samples of its mandate crops and small millets to 174 countries while over 190,000 seed samples were imported from 96 countries. He highlighted the close collaboration and
support from NPPO for the exchange of germplasm.

“New molecules have to be investigated as continued use of existing molecules comes with a risk of development of fungicide resistance. We test efficacy of new fungicides and we could find two fungicides, a combination of Carbendazim plus Mancozeb, and Tebuconazole plus Trifloxystrobin, very effective in sorghum and pearl millet for seed treatment,” he said.

Dr Sharma also informed that novel pest detection and diagnostic protocols are being explored across CGIAR’s germplasm health units including use of non-invasive techniques like Videometer seed analyzer for detection of seed-borne pathogens, and use of nucleic acid-based detection.

Dr K Anitha, Head of National Bureau of Plant Genetic Resources (NBPGR) Regional Station in Hyderabad, India, cited FAO while stating that up to 40% crop losses are attributable to pests and diseases.

Referring to recent interceptions in India, Dr Anitha mentioned that samples have to be thoroughly checked before being shipped. Dr Anitha also outlined a future strategy that includes upgrading standards within India, suitable check points while conserving germplasm in genebanks to tackle species admixture, closer coordination between government and exporters and need for standards for manufacturers, production units, monitoring of contaminants as well as additives.

Dr Gururaj Guddappa Kulkarni, Director Bio-Innovation and Global Head of Research Infrastructure and Compliance at IRRI, detailed activities of IRRI’s Seed Health Unit and mentioned opportunities for the unit in use of advanced pathogen detection techniques like PCR and ELISA.

He also informed that some of the next steps for germplasm health units across the world are strengthening monitoring of new pests and pathogens, enhancing testing methods, increasing sample testing and working more closely with NPPO in addition to coordinating and making uniform procedures across NPPOs in a region.

Ms Ellaine Tandang, Assistant Division Chief, National Plant Quarantine Services Division (NPQSD), Philippines, spoke about the importance of capacity building and increasing mass awareness of plant health and its importance for food security. The division has organized runs that involved students, government officials and police personnel, and a plant health summit last year and early this year, she informed.

Some of the other challenges pointed out during the webinar are the banning of some of the pesticides by the government which are used for salvaging of import/export material and issuance of non-compliance notices to exporting countries without scientific evidence as in the case of detection of non-pathogenic endophytes like growth promoting organisms.

The takeaway recommendations from the webinar was a call for bi-annual updates to national pests lists, regional coordination among the NPPOs, and the need to identify suitable alternatives to methyl bromide fumigation and other likely to be banned chemicals for seed treatment.

The global webinar series, “Phytosanitary Safety for Prevention of Transboundary Spread of Pests and Pathogens,” was organized by during 9-13 November by CGIAR Germplasm Health Units (GHUs) in collaboration with FAO, International Plant Protection Convention (IPPC), Crop Trust, National Plant Protection Organizations (NPPOs) and others. The UN has marked 2020 as the International Year of Plant Health.
Intellectual property databases crucial for innovation in smart agriculture

International experts in a recent webinar discussed how ‘smart agriculture’ – modern information and communication technologies for agriculture – will radically change the way we do things. Patent databases can play a key role in enabling researchers and innovators to leverage technology for agriculture through up-to-date information. Patents or Intellectual Property databases are relevant, valuable and comprehensive sources of technical and legal information that can be used for research and development of innovations.

Computers, satellites, sensors, automated machines, Internet of Things (IoT), drones and a wide range of technologies allow us to reach levels of precision that were unimaginable a few years ago. Key to driving innovation in smart agriculture is the ability to enable researchers, scholars and innovators to access up-to-date information and research partnerships.

With India’s focus on smart agriculture, it is critical that researchers and innovators understand the current trends in agricultural innovation. When compared with journals or publications, patent databases are much more advanced and informative. “At the Intellectual Property Facilitation Cell at ICRISAT (IPFC), we always advise researchers to refer to patent literature search for latest information while writing a thesis or a proposal, in addition to manuscripts and journals,” said Dr Surya Mani Tripathi, Legal Counsel at ICRISAT.

Patent databases give researchers access to patents documents that can help them learn more about innovations or options to replicate them. “A patent document contains all the technical, legal and business information pertaining to the innovation,” said Mr Ricardo Oltra Garcia, Team Manager - Operations, European Patent Office (EPO).

- The technical information included in patent documents are linked to each other that allow to access everything around that innovation or field of technology.
- The legal information includes the scope of claims that describe the legal scope of the patent, that is, which part of the innovation has been covered by the particular patent and which isn’t.
- The business information includes who the applicant is, companies that are investing in it and allows one to track trends.

Another big advantage of a patent database is the access to global patent information. Patent landscapes help to see and forecast trends in innovations and help build global partnerships. Patent landscapes also help organizations take informed decisions about their IP strategy.

Espacenet

“This is where the European Patent Office comes in. It has the largest patent database in the world, it has over 120 million documents available free of charge via its tool Espacenet,” said Mr Gerard Owens, Country Coordinator, EPO. All patent information in Espacenet is classified, indexed and easily searchable. Espacenet is linked to another free tool called Patent Translate that helps to translate from English to 33 other languages. It is interesting to note that India happens to be the sixth largest user of Espacenet. Ms Ankita Tyagi, Senior Manager IP, European Business & Technology Centre (EBTC) demonstrated how the Espacenet website works and the various features it includes.

The webinar was jointly organized by the EPO, EBTC and IPFC at AIP of ICRISAT on 10 November 2020. A total of 125 participants including scientists, researchers, and innovators took part in the webinar.
Legal experts decode rules for plant variety protection registration

Legal experts in plant variety protection noted that registering a new plant variety in India, although time-consuming, can be simplified with a clear understanding of Indian regulatory and legislative frameworks. Steps involved in this registration process were clarified at a recent webinar, along with definitions and various key aspects of the Protection of Plant Varieties and Farmers’ Rights Act, 2001 (PPVFR Act).

Dr Neeti Wilson, a subject expert and partner at the law firm Anand & Anand, and Dr Surya Mani Tripathi, legal counsel at ICRISAT, took the participants through each step in the plant variety registration process during the webinar, which was moderated by Ms Ankita Tyagi, Senior Manager IP, European Business & Technology Centre (EBTC).

Dr Wilson began described the legal scenario and legislative framework for plant protection in the country. She emphasized that, besides the rules and regulations, there were several public notices issued by the Protection of Plant Varieties and Farmers’ Rights Authority (PPV&FR Authority), Government of India. Some of these public notices include regulations and must be paid close attention to. “For example, last year a public notice was issued on hybrid varieties as to why the hybrids would be registered in a combined manner with their parent line so the notices are very important when we are looking at plant protection variety in India,” Dr Wilson added.

Preparing to file plant variety protection application

Dr Wilson described the criteria for a plant variety to be registered under the PPVFR Act. Currently there are 4,098 registered varieties under the PPVFR Act and 158 species up for registration. She noted that Indian legislative framework was still ‘young’ and evolving in phases. This is because India is developing testing guidelines for each species and that process is time-consuming.

The speakers discussed various milestones in the registration process, noting that the process begins two years before the actual application. They also provided a brief overview on the gamut of applications, forms and fees that need to be planned for, and addressed for a registering a new plant variety. For the pre-application phase, collating all the information on the breeding history and data related to uniformity and stability is a very critical part. “Apart from the forms, the statement of distinctness is the most critical aspect of the application process. This is statement that compares your plant variety with other varieties and shows distinct traits with the support of declarations you submit,” said Dr Wilson.

Plant variety registration procedure

The registration of a plant variety contains four main processes and each process has several steps. The process begins with the application to the Registrar, PPV&FR Authority. “While registration seems looks long and confusing, it can get easier once you become familiar with the processes,” Dr Wilson said. The details of the registration process, the testing phase and the validity of the certificate were also discussed during the webinar.

India’s unique plant protection act

Dr Surya Mani Tripathi highlighted the fact that many countries have taken a cue from India when it comes to drafting their own plant variety protection laws. Although existing International systems that can reduce the registration time exist, India chose to have its own to protect rights of small and marginal farmers that international systems do not allow for.

This webinar, part of a series jointly organized by the European Business & Technology Centre (EBTC) and the Intellectual Property Facilitation Cell (IPFC) at AIP of ICRISAT, was organized on 30 October 2020. A total of 240 participants including scientists, researchers, breeders and farmers took part in the webinar.

A recording of the webinar can be viewed here: https://youtu.be/vMGstdbcf8n
Farmers in Mali endorse climate-resilient and high-yielding crop varieties

Farmers in Mali, who volunteered to grow climate-resilient and locally adapted varieties of sorghum, pearl millet, groundnut and cowpea crops under the UE-APSAN-Mali project, demonstrated the superior features of their crops during a field visit by other farmers, seed producers and local officials. Small groups of selected highly motivated farmers identified through project implementing partners had carried out testing trials and demonstrations on their pilot plots.

In front of her sorghum demonstration plot, Mrs Baro Coulibaly from the Local Union of Cereals Producers (ULPC) is happy to explain the qualities of Soubatimi, a sorghum variety, saying, “Soubatimi is very productive; good for both human consumption and animal feeding.”

“The varieties demonstrated here are better compared to our local varieties,” says Mr Amadou Diallo, a cowpea producer. Another woman farmer, Ms Awa Konaté from Diarani village in the Commune of Wakoro, Dioila, tested three varieties of groundnut, of which two have performed well. “These two new varieties are promising a good harvest. I encourage everyone, especially women, to try these new varieties during the next cropping season.”

In the demonstration trials of improved pearl millet varieties, Dr Daouda Sanogo, Millet Breeder at the Institut d’Économie Rurale- IER Mali, invited producers to carefully look at performance of different varieties and to position themselves in front of their preferred one. Standing with him, Mr Lassina Traore, Mayor of Dioila, a special guest of the event, explained his preference for Maiwa, a new variety in the agenda of this year 2020 farmer’s field visit. “This is a variety that exhibits plant vigor, stay-green leaf, and bold grain compared to many others,” he said. Beside him, another producer explained his choice for Maiwa because of its resilience to drought. “Maiwa stays green despite drought, which is a major challenge. I would like a variety like this to be made available on a large scale. This field visit is useful, and a very effective way to educate more farmers about the benefits of improved varieties.”

In M’Pessoba too, the farmer field visit was attended by local authorities led by the Mayor Mr Kalifa Coulibaly. Mr Dramane Sibiry Coulibaly, a sorghum farmer, described how he was involved in the experience of testing new varieties of the project. There were many varieties to which members of his Jigiseme Cooperative were exposed this year, but Tiandougoucoura got his preference. “This year I volunteered to test three varieties – Tiandougoucoura, Samboni, and Soubatimi – along with a local control. I noticed that the new varieties have good germination, they are very early-maturing, their plants are vigorous and their leaves stay green up to maturity. Among them all, Soubatimi is the earliest maturing; it shows good grains compared to the control. Also, its stems are liked by animals. During the next cropping season, I would like to enlarge my production plot, especially with Tiandougoucoura and Soubatimi, which are good for livestock feeding,” Mr Coulibaly said.
Mr Souleymane Ballo, President of the Jigiseme Cooperative of M’Pessoba, showing his sorghum hybrid *Pablo* seed production plot of 1 hectare, said, “We have 13 other plots of the same size with different members of our cooperative. We focus on seed production because it is a good pathway to achieving food security. Per hectare, we can harvest about one ton which is sold at the rate of 750 FCFA per kg. It is a really profitable business. This year, we have already secured a contract with a buyer for part of harvest. We hope that many farmers visiting this sorghum seed production plot will be encouraged to join us in this journey”.

Dr Baloua Nebie, Sorghum Breeder at ICRISAT and Coordinator of the UE-APSAN-Mali project, said, “All the improved varieties and hybrids in the demonstration plots are registered in the regional seed catalog. Farmers’ organizations and seed companies start their seed production to meet the demands.” Echoing his words, Mayor Kalifa Coulibaly also commended the project to participants, saying, “This project perfectly meets the objectives of the Government of Mali towards achieving food and nutritional security, as well as the promotion of employment in the context of climate change.”

For Mr Mama Berthé, who tested new cowpea varieties, the goal was to evaluate their performance in terms of yield and probably take them on a larger production plot during the coming cropping season for both family consumption and for the market. “I notice that two of the varieties tested – *Acar 1* and *Simbo* – are early-maturing and are adapted to the increasingly short rainy season. In addition, their grains are big and attractive. If the harvest is good, I would like to grow the best variety on one hectare next year, moving from testing to expand my cowpea production.”

“The world is changing and the world’s climate too. To face this change, researchers are pursuing research and are making progress every day. As farmers, we need to follow the new development,” concluded this experienced seed producer, a national silver medalist recognized for his contribution to Malian agriculture.

Dr Mamoutou Kouressy, Coordinator of the UE-APSAN-Mali for IER, said, “Indeed the farmers’ field visit offers the opportunity to pilot farmers to share their experiences with those who did not participate in the testing work. It is also an opportunity to witness the adaptation of new varieties to farmers’ environments.”

During the field visits, conducted on 22-23 October 2020, flyers with the key characteristics of the varieties/hybrids and the contacts of the seed production units, were distributed to participants so that they could have access to the seeds of their preferred cultivars. The event included some sensitization on COVID-19 preventive measures.

For more on our work in Mali, click here.

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

**Funder:** European Union

**Partners:** Institut d’économie rurale (IER), Farmers’ organizations (ULPC, Sene Yiriwaton, Jigiseme, COOPROSEM, Union Nietaa), Agricultural extension services in Segou, Kayes, Kita, Koutiala, Yorosso, national NGOs (Malimark, EUCORD), and Seed companies (Faso Kaba, Dun Ka Fa, SOPROSA, Camara Semence, Zamoho), universities in Mali, CORAF/ WECARD and ICRISAT.

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

This work contributes to UN Sustainable Development Goals
The Coconut-Based Livelihood Program in Odisha, India, under the Odisha Livelihood Mission (OLM) in collaboration with ICRISAT, recently converged with a national employment scheme. As a key partner, ICRISAT will be involved in mass-scale plantation of coconut saplings following improved practices using a farmer-participatory approach. It is hoped that this will boost livelihood opportunities and enhance the socio-economic conditions of the rural poor through promotion of sustainable livelihoods.

Under this scheme, 20 villages have been identified for supporting the farmers with quality seedlings, integrated nutrient management and plant protection practices.

The state of Odisha has been battered by cyclone Fani in 2019 and by the COVID-19 pandemic this year. Both these factors have caused extreme loss of crops and coconut plantations across the state. The convergence of OLM’s coconut plantation program and the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) will focus on the primary sector of the livelihoods of rural poor and work intensively in agriculture, non-agriculture and livestock sectors.

Activities undertaken

On 3 November 2020, a plantation program was organized by ICRISAT at Kulintira Gram village in Pampalo of Balipatna block, in the presence of the local sarpanch (the village head), OLM officials, ICRISAT officials, and local coordinators. Also, pre-planting activities like soil sampling techniques in plantation crops, usage of MSoil application, measurement of the pit area, mechanical pit digging and pit filling procedures were demonstrated.

The plantation program was inaugurated by Mr Diganta Routray, Project Director, District Rural Development Agency, Khordha district along with Mr Bibek Behuria (DPM), the local sarpanch, ICRISAT officials, OLM officials and progressive farmers from the villages.

This was followed by a discussion on preparation of a road map in convergence with MGNREGS for undertaking different scientific interventions in coconut to improve the livelihood of farmers. The updates on scientific method of coconut plantation, vertical intensification in coconut (multi-storied and intercropping), nutrient management, capacity building initiatives undertaken in the project was shared by the ICRISAT team guided by Dr Gajanan Sawargaonkar, Senior Scientist; Dr Rohan Khopade, District Coordinator; Dr PK Mishra and Dr PC Lenka, Project Consultants.

Mr Bibek Ranjan Behuria, District Project Manager, Khordha, talked about the benefits of utilization of barren land through coconut plantation and multifaceted livelihood systems. Farmers also expressed their happiness over the current activities as cyclone Fani had battered coconut plantations in the year 2019.

“The convergence of different development programs is highly desirable as it saves money, time and scarce resources and also helps promote inter-department collaboration. However, it is also very challenging to achieve it at the field level as it requires a high degree of coordination,” said Dr Sreenath Dixit, Principal Scientist and Head, ICRISAT Development Center (IDC). “I am extremely happy that we have achieved this activity and the initiative of MGNREGS and OLM has made the initiative possible in the state of Odisha.”

For more on our work about agricultural diversification, click here: http://exploreit.icrisat.org/profile/diversification/46
Gross Margin Analysis – A tool for better farm management

A training session for farmers in Niger

In order to guide farmers in Niger to make better informed decisions about their farming activities, a training on Gross Margin Analysis was organized to empower them with necessary skills to determine their farms’ profitability. Gross Margin Analysis (GMA) is a simple, reliable tool to assess the financial performance of an enterprise. This training would help farmers to calculate the productivity of their farms and compare the performance of different technologies and practices they applied, leading to better management of their farms.

Farmers in Niger are eager for a change in the way they manage their farms. Traditionally, they have planted crops and raised animals without knowing for sure if they were going to make a profit out of that. Many farmers claim, “We farm what we know we can farm and hope that the season is a good one.” There is little evidence of the economic viability of farming activities and minimal adoption of profitable technologies. Possibly, this leads to their incomes remaining very low.

“I’ve always practiced sheep fattening in the traditional way, but after carrying out a gross margin analysis on sheep fattening, it is clear that I can make around 20,000 CFA (US$ 40) more per sheep if I adopt a better feeding strategy for my sheep,” says Ms Mariam Yero, one of the training participants. “Also, from the gross margin of goat rearing I realized that I can make around 185,000 CFA (US$ 335) per year by only starting with two female goats and one male goat.”

“Until now, I never realized that we only make a profit of 30,000 CFA/ha of millet we cultivate,” says Mr Moussa Oumarou. “From the analysis we conducted, I can see that we can raise this amount to 160,000 CFA (US$ 300) just by adopting an integrated production system (using improved dual-purpose millet +cowpea, using compost and applying the fertilizer to seed hole). This training is an eye-opener to us.”

The GMA training session was a success, with participants getting a clear understanding on why gross margin was important and how they could use this simple tool to assess the performances of technologies and productivity of their farms. By knowing the gross margin of the crops grown and other farm enterprises, farmers can determine how much money the different activities can generate, enabling them to select appropriate technologies and/or products to focus on.

The training session was held for 75 Innovation Platform members, including 22 women, on 3-4 November 2020 in Torodi and on 7-8 November in Maradi in Niger.

For more on our work in Niger, click here: http://exploreit.icrisat.org/profile/Niger/334

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This work contributes to UN Sustainable Development Goals

Project: Enabling Value Chains to Create Sustainable Income for Vulnerable People in Crop-Livestock Systems of Burkina Faso and Niger
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Natural resource management

Scale-up of integrated drought management gets nod from State Minister in Uttar Pradesh, India

Impressed with the rapid pace and impact of the Doubling Farmers’ Income (DFI) initiative and other interventions in Lalitpur district, Uttar Pradesh (UP), Mr Hargovind Kushwaha, Minister of State, UP Government, expressed satisfaction and willingness to scale up this approach to other parts of the Bundelkhand region with ICRISAT and the state machinery’s involvement.

Mr Kushwaha, members of the Bundelkhand Development Board and elected representatives of Jhansi and Lalitpur districts, recently visited Pura Birdha village in Lalitpur, where the DFI initiative and other interventions have been implemented. They saw firsthand the impact of various project interventions such as haveli renovation, building of farm ponds and diversion drains, agroforestry, etc. They also attended crop and fodder demonstrations and interacted with tribal groups and vulnerable farming communities.

“To bring prosperity to the water-scarce region of Bundelkhand, the integrated approach implemented in Pura Birdha village is a very thoughtful and sustainable solution,” the Minister said. Several delegates are also members of the Bundelkhand Development Board, which has the mandate of developing the strategies for the overall development of the region.

A Central Government initiative – the Scheduled Caste Sub Plan – has converged with the DFI project, with Dr Inder Dev, Principal Scientist, ICAR-CAFRI, leading it. In 2020, 625 families (including 230 female-led households) benefited from this convergence. Inputs worth about ₹27 lakhs (about US$ 36,500) have been made available under this scheme, helping these families to undertake agriculture activities and improve crop production. During the recent meet, agriculture tool kits and fertilizer inputs were provided to 70 beneficiaries in the Minister’s presence.

The event was conducted on 13 November 2020, and was facilitated by Dr Ramesh Singh, Principal Scientist, ICRISAT; Dr Inder Dev, Principal Scientist, ICAR-CAFRI; scientists and scientific officers from CAFRI ICRISAT and NGO staff from Upman Mahila Sansthan, Jhansi.

For more on our work in natural resource management, click here: Natural Resource Management | EXPLOREit@ICRISAT

Delegates witnessing the increased groundwater level in the open well at Pura Birdha village, Lalitpur, Uttar Pradesh.

Mr Hargovind Kushwaha, Minister of State, Uttar Pradesh, addressing the farming community at Pura Birdha village, Lalitpur.

This work contributes to UN Sustainable Development Goals
Dr Jacqueline d’Arros Hughes, Director General, ICRISAT, arrived in Hyderabad, India, a few weeks ago, for the first time after assuming her position during the pandemic-related lockdown. After spending the requisite time in quarantine, she started her first tour of the campus by visiting the Charles Renard Analytical Laboratory at the Hyderabad campus, accompanied by Dr Pooran Gaur, Director, Research Program Asia, to overview the laboratory facilities for soil, plant and water analysis, on 4 November 2020.

Acknowledging the utility of the soil health cards printed in various local languages, she said, “These soil health cards serve as an easy reckoner to the farmers for applying fertilizers based on the soil analysis.” She also appreciated the precautions taken by the laboratory staff while performing the analysis by following the COVID guidelines under the current pandemic situation.

(R) Dr Pushpajeet Choudhari, Manager, Charles Renard Analytical Laboratory, explaining the working procedures of the lab to Dr Jacqueline Hughes, Director General, ICRISAT (center) and Dr Pooran Gaur, Director, Research Program Asia (L).
Due to travel restrictions brought on by the COVID-19 pandemic, Dr Jacqueline Hughes, Director General, ICRISAT, virtually toured several stations in East and Southern Africa (ICRISAT ESA) – Kenya, Tanzania, Malawi, Mozambique, Zimbabwe and Ethiopia.

A focus on exploring opportunities to make quantifiable impact is critical, she said, speaking during meetings with staff where she emphasized on the importance of institutional visibility of our program and the impact we are making globally for purposes of keeping ICRISAT perfectly positioned as we move into the future and as we transition into one CGIAR.

According to Dr Hughes, impact can be made by ensuring that ICRISAT’s research work addresses the needs of target beneficiaries while conserving the natural and environmental resources; paying stronger attention to our partners and funders when need arises.

She commended the staff for ensuring that ICRISAT’s work continued despite the effects of COVID-19 especially, governments’ measures and policy responses to contain the spread of the disease. Staff were encouraged to double down on research efforts, particularly where containment measures have eased. The measures and policy responses to the crisis have disrupted agro-input supply chains, and led to labor shortage and price fluctuations, which have had significant impacts on food security across the continent. United Nations Economic Commission for Africa (UNECA), reported that Africa’s GDP growth is expected to drop from 3.2% to about 2% due to the ongoing COVID-19 pandemic, pushing millions further into extreme poverty.

According to Dr Rebbie Harawa, Regional Program Director-ESA, ICRISAT, the virtual tour was timely and served as an inspiration to the staff who have braced the COVID-19 pandemic to keep ICRISAT’s work ongoing. The staff who had the opportunity to listen and ask questions to the DG were delighted to hear from her and are also looking forward to a physical visit to the locations.

The meetings which were held for Kenya, Tanzania, Malawi, Mozambique, Zimbabwe and Ethiopia included zoom meetings with the staff and videos showcasing offices, field stations, laboratories and storage facilities for the ESA region. Dr Hughes called on all regional hubs to compile such location videos as learning material so that all staff can understand activities in other regions and countries.

Screenshot of Dr Hughes, Director General, ICRISAT, interacting with staff of ICRISAT Zimbabwe.

Photo: G Obiero, ICRISAT
Seven scientists from ICRISAT among top 2% Indian scientists–Stanford study

As per a recent study by Stanford University, USA, seven scientists from ICRISAT are among the top 2% of Indian scientists in the world ranking in their respective subject areas. The study presents an update to citation databases of top-cited scientists across all scientific fields, including more granular information on diverse indicators. Authors of the study analyzed data using citations from Scopus with data freeze as of May 6, 2020, assessing scientists for career-long citation impact up until the end of 2019 and for citation impact during the single calendar year 2019. The study was published in the PLOS Biology journal.

The study selected the top 2% of scientists from India under different subject areas; seven among them are from ICRISAT. The featured ICRISAT scientists and their worldwide ranking in respective subject areas are Dr Rajeev K Varshney, rank 123; Dr KL Sahrawat, rank 153; Dr HC Sharma, rank 217; Dr Hari D Upadhyaya, rank 652, Dr Vincent Vadez, rank 680; Dr PS Roy, rank 867 and Dr Peter Carberry, rank 953.

The study can be seen as a testament to the fact that research outputs generated by ICRISAT scientists serves as an International Public Goods for the global scientific community and in advancing scientific studies across focused subject areas. The implementation of these findings on the ground benefit smallholder farmers in Asia and sub-Saharan Africa.

“It always feels good when your work is recognized and, more importantly, when it is utilized for the global good,” said Dr Varshney. “I am sure the research we carry out at ICRISAT together with partners and collaborators contributes significantly towards the global effort to fight against food insecurity and malnutrition,” he added.

To learn more about research work of featured ICRISAT scientists and their publications visit their profile section on ICRISAT Open Access Repository. Peter Carberry, OAR Link; Hari D Upadhyaya, OAR Link; Hari C Sharma, OAR Link; Rajeev K Varshney, OAR Link; KL Sahrawat, OAR Link; Vincent Vadez, OAR Link; PS Roy, OAR Link.

In addition to assessing scientists for career-long citation impact up until the end of 2019, this study also provides citation impact during the single calendar year 2019, which features Drs Rajeev K Varshney, Vincent Vadez, Hari D Upadhyaya and Manish K Pandey from ICRISAT.
World Quality Day observed

Mr Muzamil Baig, Quality Manager at ICRISAT Genebank, discusses quality in work processes with the genebank staff. World Quality Day was observed by the genebank on 12 November. Mr Baig enquired about upgrades made in the genebank’s quality management system during the past year and their impact. A competition is being held and genebank staff can provide suggestions, banners and identify risks. The best entries will be awarded.

ICRISAT Governance and Compliance Advisor recognized for excellence in governance

Ms Renerose Tan Ng, Board Secretary and Governance and Compliance Advisor, ICRISAT, has been recognized by Diligent’s Modern Governance 100 program. The Modern Governance 100 is a community of governance professionals who have been nominated for their innovation, resilience, dedication and empathy in the face of a complex and ever-changing world.

Adaptability in uncertain times is critical, as Ms Tan Ng well knows. She recognizes the dynamic and volatile nature of the business environment ICRISAT operates in, and she understands that governance practices must adapt to meet the moment. “I personally believe that to be able to fully realize the potential of a governance body, we should be able to adapt to changing demands and culture,” Ms Tan Ng explains.

“It has been very rewarding for my organization to be fully equipped with what they need to effectively make decisions while facing challenges in meeting face-to-face, competing priorities, and also unforeseen disruptions such as the COVID-19 pandemic,” Ms Tan Ng says.

The impact of digitizing governance has been felt across the organization, and she applauds her colleagues who have been supportive and willing to embrace Diligent Boards to elevate and enhance the company’s operations and performance.

“I am grateful that the power of inclusive decision-making has become evident in the process of modernizing the way we do governance,” remarks Tan Ng, “and I can say it’s a success of the whole organization, not just of one person.”
IFNH 3rd Annual Forum

Addressing Food System Challenges: Making inter-disciplinarity work

The Institute for Food, Nutrition and Health (IFNH) is having its 3rd Annual Forum on 15 December 14.00 – 17.00 (GMT). The theme of this year’s Forum is the importance of inter-disciplinary working to successfully address food system challenges. Speakers will be from the University of Reading as well as key partners from ICRISAT and the University of Florida.