A new initiative to popularize millets by developing products as well as branding of Karnataka *ragi* (finger millet) was launched recently. This is driven by the Government of Karnataka, following an intense day of deliberations and insights from food processors on the major hurdles they face and the market opportunities that exist. The Government of Karnataka will partner with ICRISAT and the Indian Institute of Millets Research (IIMR) to bring this to fruition with strong support from the industry.

Commonly seen as food for the poor, millets face many challenges to reach their full potential, the primary challenge being low investment along the value chain. This perception is set to change, as the health and environmental advantages of millets are being recognized by governments and other actors in the food industry.

Much of the efforts to date have been to increase millet productivity at the farm level. Additional efforts are needed to develop the demand side, while also making sure the farmers benefit from this.

As Karnataka is the major producer of the *ragi* in India, an additional complementary initiative is to brand Karnataka *ragi* to build a unique image to further develop consumer interest in this cereal.

“Millets are good from multiple points of view. So far our efforts have focused on the supply side and there’s been considerable success in increasing yields and developing more resilient varieties. But I feel the demand side has hardly been touched at all. We need a pull from the market to sustain the supply side. *Ragi* compares well on most accounts with quinoa and compares better on many other accounts. So what is holding *ragi* back? That’s what we want to find out and overcome through this initiative,” said Mr Krishna Byre Gowda, Minister for Agriculture, Government of Karnataka.

The Government of Karnataka has been a leader in India in scaling up technologies with farmers, through mega programs over the past six years. These include Bhoochetana, Bhoo Samruddhi and the recently launched, Golden Agriculture Village Scheme. The Government of Karnataka is now keen to ensure that these efforts are fully capitalized on, by investing in demand-driven initiatives.

A way forward was agreed upon by the Government of Karnataka, representatives from major food processors and supporting government and non-government bodies. They agreed on the outline of the initiative and recognized existing opportunities to build the millet market, both within India and globally.

The action plan includes building a public private consortium of partners to focus on the demand pull for millets through real actions. A more detailed road map will be planned over the next few months and once there is clarity on the best strategy to raise awareness and create a buzz around millets and especially the key messages for millets, the Karnataka government will hold a larger workshop in Bengaluru with a wider range of stakeholders.

“There is a need to change the image of millets. Make them more modern and create a buzz around them. Developing appropriate consumer products is a key component to achieve this. That’s why we have started a Smart Food campaign with the motto: good for you, good for the planet and good for the smallholder farmer. They are highly nutritious and have health benefits, use less water and have high drought tolerance and increasing their market value benefits farmers,” said Dr David Bergvinson, Director General, ICRISAT.
Dr B Dayakar Rao, Principal Scientist, IIMR said, “There are many reasons why millets are not a regular product in the consumer basket. One of the reasons is the fact that not many processing technologies have been developed yet. It’s not enough to just brand a commodity and take it to the market, an entire value chain is needed. We are doing that and I am confident this partnership will make millets popular among consumers.”

Some challenges identified at the workshop held on 19 August, included:

- Consumers do not view millets as a modern product
- Awareness of health benefits is limited to niche markets
- Lack of scientific information to substantiate any health claims about millets
- Clear information about millets and the technologies
- Lack of grading and standards for millets
- Need for more food processing technologies specifically for each type of millet
- Varieties especially suitable for processing qualities have to be developed

Millets, often called nutri-cereals, are highly digestible, gluten free, have low glycemic index and are high in antioxidants. Recent studies have also shown that pearl millet has the potential to fight iron deficiency, the biggest nutrient deficiency facing the world, especially prevalent among women and children across India and sub-Saharan Africa.

Some varieties of pearl millets survive temperatures of up to 64°C. The crop can be harvested within 60 days, as against 100-140 days for wheat. While 2,100 mm of water is used during the growing period for sugarcane and 1,250 mm for rice, millets require less than 500 mm of water. Finger millet and pearl millet can be grown with 350 mm of water, while sorghum requires 400 mm of water.

Watch a video of the workshop [here](#).
A new partnership has been formed to build a network to accelerate the use of technologies in agriculture across eight countries in South Asia. This was announced at the signing of a Memorandum of Understanding (MoU) between the SAARC (South Asian Association for Regional Cooperation) Agriculture Centre (SAC) and ICRISAT.

SAC and ICRISAT will look for opportunities to carry out joint research in areas of mutual interest by sharing existing resources and results, as well as facilitate policy changes in National Agricultural Research Systems (NARS) to speed up the process of varietal release and dissemination in the region.

Under the collaboration, new and appropriate technologies will be adopted for maximizing production and to increase sustained productivity in stress-prone areas through the extensive network of SAARC. This will help smallholder farmers adopt these new and improved technologies to increase food production and raise their incomes in areas having limited water.

“ICRISAT welcomes this partnership with SAARC to accelerate the release of proven crop production technologies across South Asia, especially improved varieties as has been done for rice. Apart from accelerated release of improved varieties, ICRISAT sees additional opportunities in sharing best practices in seed systems and can work with SAARC on their new Seed Bank. SAARC’s initiative to harmonize standards for foods in the region will be very important so farmers can realize better prices through transparent grades and standards. We are keen to work with SAARC to achieve these important outcomes that will benefit smallholder farmers’ access better technology and consumers in accessing better nutrition through diversified diets.” said Dr David Bergvinson, Director General, ICRISAT, at the signing of the MoU with Dr Shaikh Mohammad Bokhtiar, Director, SAC.

Dr Bokhtiar noted that one of the biggest challenges for the region is food and nutritional security. “In the past we did not talk about the nutritional quality of our agriculture but now it is of high importance. We will be working with the region to pull together a regional strategy for food and nutrition. We are also very sensitive to climate change which is a big issue. Being rice-growing countries heavy use of ground water is a big issue. We are also using and depleting so many nutrients from the soil, which will be a big problem for the next generation. SAARC can help facilitate the exchange of technologies between countries in the region. This can save time and achieve successes faster.”

This collaboration will significantly contribute to the medium-term food and nutritional security in the region. The poor people of these areas are also the most vulnerable to climate change and variability. These areas are typified by low productivity and inadequate capacity for coping with risk due to climate adversities, poor soil conditions, and a lack of farming skills, knowledge and poor management practices.

SAC is the first regional agriculture centre of the SAARC and aims to accelerate the process of economic and social development among member countries through promotion of agricultural research for development as well as technology dissemination initiatives for sustainable agricultural development and poverty alleviation in the region.
A participatory approach involving farmers to solve crop and livestock production challenges in the semi-arid areas of central Tanzania, won the appreciation of the Tanzanian Deputy Minister of Labour, Employment and Youth Development, Mr Anthony Mavunde at an agricultural fair held recently.

Aflatoxin mitigation, food safety and market competitiveness; using gliricidia as green manure for doubling up pigeonpea productivity; improving poultry genetics and feeding for enhanced productivity; integrated crop management technologies; and improved seeds for quality protein maize were among the technologies showcased. Visitors’ queries were addressed by farmers and officers from the ICRISAT-led Africa RISING project being implemented in the semi-arid areas of Kongwa and Kiteto districts.

“I am impressed by what Africa RISING is doing. The farmers are confidently explaining the showcased technologies. This participatory approach of farmers learning from fellow farmers as we have seen today will quicken technology dissemination and help them learn from the innovation platforms established,” said Mr Mavunde. The minister was also impressed by the initiative to intensify aflatoxin awareness campaigns among farmers in the wake of a mysterious disease, said to be caused by aflatoxin that left 14 people dead.

The stall put up at the week-long agricultural fair in Dodoma was visited by over 1,000 farmers and was named one of the most visited sites by a group of evaluators. The fair brought together farmers and other agricultural stakeholders including universities, research institutes and agricultural inputs suppliers.
Increased productivity for Indian farmers through farmer producer organizations

Making agriculture profitable by involving farmers along the entire agricultural value chain through Farmer Producer Organizations (FPOs) has been initiated in Andhra Pradesh, India.

Recently 1,000 FPOs were launched by the Chief Minister of Andhra Pradesh Mr N Chandrababu Naidu for which ICRISAT will provide technical support. Each FPO, having 1,000 members, will deal with more than one commodity to ensure year-round sustainability. The target is to bring one million farmers under FPOs. On the occasion, 12 corporates signed Memoranda of Understanding covering different commodities to support the FPOs.

The FPOs will provide necessary inputs to the members and also provide market linkages for the farm produce of its members. The scale of operations will enable members to save money on inputs and also get a better share of the market price by working directly with corporates. These FPOs will also serve as knowledge delivery institutions for the farmers.

The FPO policy has been prepared by a group consisting of different line departments of Govt. of Andhra Pradesh, World Economic Forum and ICRISAT steered by Mr Chiranjiv Chaudhary, CEO and Commissioner, Horticulture.

The FPOs have been established under the Rythu Kosam (Primary Sector Mission Project). On the occasion, the Chief Minister and other elected representatives addressed a large gathering of farmers and highlighted the benefits of the FPOs as well as the benefits of the Rythu Kosam program which is technically supported by an ICRISAT-led consortium and is being implemented in all the 13 districts of the state.

The FPOs were launched on 6 August in Anantapur district, Andhra Pradesh. At the event Dr David Bergvinson, Director General, ICRISAT and Dr Suhas Wani, Director, Asia Regional Program ICRISAT interacted with Mr Prathipati Pulla Rao, Agriculture Minister, Mr T Vijaya Kumar, Special Chief Secretary, Agriculture and other officials.

This work contributes to UN Sustainable Development Goal 8: Decent Work and Economic Growth
Farmers in 1,000 villages of Karnataka, India, are expected to benefit in a major way through a new collaborative initiative that was launched recently. In the first phase, 105 villages will be developed as model villages and targeted farmers’ incomes will be increased by 20% in one year through augmented productivity, diversification and market linkages.

Recognizing the potential for a strong collaboration in dryland agriculture, the Government of Karnataka and ICRISAT along with consortium partners, launched a new scheme called Suvarna Krishi Grama Yojane: Transforming agriculture and livelihoods in rural Karnataka (Golden Agriculture Village Scheme) on 3 August in Hirebidnur town of Karnataka. Mr Krishna Byre Gowda, Minister of State for Agriculture, Karnataka, launched the scheme.

By actively involving the community from the start, the main objective is to transform rural areas by developing an impact oriented participatory model using state of the art technologies. This model can be scaled up for more integrated and sustainable rural development in the state.

A comprehensive approach will also be taken by promoting Inclusive Market Oriented Development (IMOD) that links farmers with the markets and builds stable partnerships.

“Our government is keen to ensure large benefits to farmers in the state by bringing science-led development to the farmer’s doorstep with technical support from premier international institutions like ICRISAT and our state universities through schemes like Bhoochetana and Bhoo Samruddhi. We are now strengthening our collaboration with ICRISAT and other international institutions, state universities and departments of Karnataka government (Agriculture and allied sectors) to enhance the impact of Suvarna Krishi Grama Yojane,” said Mr Gowda.

Dr David Bergvinson, Director General, ICRISAT said, “To increase productivity, production and profitability for Karnataka farmers, we have been working together with the Government of Karnataka through several successful initiatives. This new collaboration will take our partnership to a higher level and we are optimistic of further transforming the agricultural sector and livelihoods of Karnataka farmers.”

One of the most important strategies to be adopted for achieving the vision of this new scheme is to undertake science-led and demand driven development of rural areas by adopting the principal of convergence, collective action and capacity building through a consortium approach, where all partners and stakeholders work together.

Mr Ramalinga Reddy, Minister for Transport and District in-charge Minister for Chikkaballapur District said, “We are happy that this district has been included in the first phase of Suvarna Krishi Grama Yojane and international organizations like ICRISAT will be helping the district to transform agriculture in the district through these villages.”

“We request ICRISAT to bring new technologies and demonstrate to our farmers along with the other institutions and universities to benefit the farmers. The most important thing is we need to change our mindset so that new technologies are adopted and farmers get the benefit through this scheme,” said Mr NH Shivashankara Reddy, Deputy Speaker, Karnataka Legislative Assembly and MLA, Gauribidanur town.

Two books — Enriching Farmers’ Lives: Bhoo Samruddhi and Transforming Rural Livelihoods thru Mission Bhoochetana were also launched during the occasion.

The Government of Karnataka decided to implement the Suvarna Krishi Grama Yojane as indicated in the 2015-16 budget speech of the Chief Minister of Karnataka in pilot districts which will be scaled-up in a phased manner in subsequent years.

The new initiative is expected to provide better livelihoods to thousands living in rural communities in Karnataka through skill development, higher productivity, profitablity and increased happiness due to better infrastructure and facilities in their areas.
Four new sites selected to establish wetlands to reuse domestic and industrial wastewater for irrigation

Action plans for bio-treatment of industrial and domestic waste water for use in agriculture and aquaculture at four sites in three Indian states were drawn up at a recent training course held in collaboration with the University of Florida, USA.

Lessons learnt from an ICRISAT-led project that demonstrated the use of ‘constructed wetlands’ as decentralized wastewater treatment systems (DWATs) helped in the planning.

The four proposed sites are as follows:

- In Fasalwadi village, Telangana, a constructed wetland with a capacity of 176 cu m per day will ensure cleaner water with nutrients for agriculture while preventing contamination of open wells and reducing water pollution load in the local environment.
- In Srikakulam, Andhra Pradesh, a small constructed wetland as demonstration site with treatment capacity 25 cu m per day will treat urban sewage runoff. The focus will be on reduction of fecal coliform load as well as the nutrient load. The treated wastewater will be used for aquaculture and gardening in colony parks. The biomass generated in the wetland will be harvested with the help of community volunteers and used as compost in the colony parks.
- In Pandravedu village, Tamil Nadu, waste water from the dyeing industry will be treated through a 850 sq m constructed wetland with a treatment capacity of 18,000 cu m per year. This will reduce the inflow of polluted water into the irrigation channels in the village, improve tank water and groundwater quality, and reinforce aquaculture practices. The long-term benefits will be improved ecosystem services, reduced adverse health impacts, improved floral and faunal biodiversity.
- In Chintalapalem village, Andhra Pradesh, the proposed constructed wetland will treat ferro-alloy industry waste water and make it safe to be released into the local public water bodies.

The course on ‘Wetlands for Water Treatment and Resource Recovery: Science and Applications’, was held at ICRISAT, Patancheru, from 25-29 July. Participants for this course were from agriculture, health, sanitation, and water sector backgrounds.

Faculty from University of Florida – Dr Ramesh Reddy, Graduate Research Professor and Department Chair, Dr Mark W Clark, Associate Professor, Wetland Ecology, Dr Patrick Inglett, Associate Professor and Dr Kanika Inglett, Assistant Professor, shared their expertise in wetland treatment technologies. Dr SP Wani, Regional Program Director – Asia and Theme Leader, ICRISAT Development Center, Dr Mukund Patil, Scientist, Soil Physics, Asia Program, and Dr Aviraj Datta, Visiting Scientist, ICRISAT, shared their experiences. As part of the course, a field trip was organized to established DWATs at Kothapally and the proposed site at Fasalwadi.
A research study in Myanmar seeks to identify crops with the lowest risk options for intensifying dryland cropping systems.

Myanmar’s agriculture depends highly on monsoon rains. The mean annual yields of paddy rice, rainfed rice and pulses in Myanmar are severely affected by extreme weather events as well as low rainfall during the El Niño phase (warm phase) of the El Niño Southern Oscillation (ENSO), as what occurred in 2015. To address this issue, a project being led by ICRISAT, funded by the CGIAR Research Program on Climate Change, Agriculture and Food Security in Southeast Asia (CCAFS SEA), seeks to understand and identify a range of promising rice-fallow intensification options to enhance agricultural productivity particularly in the regions of Magway, Pakokku, and Monwya in CDZ.

Surely it is possible to reverse engineer these experiences, extract lessons on how these processes have succeeded and use them to perfect the innovation and impact thing that we are all talking about? But first let me share some of my worries about the global obsession with innovation. Has innovation become the new participation, a normative tyranny where the journey has become more important than the destination?
PPP – the new paradigm in agriculture sector

Fourteen new videos bring you different views on how Public Private Partnerships (PPPs) are revolutionizing agriculture.

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Development Assistance Specialist, United States Agency for International Development - USAID, India  
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Two new seminars in the Take 2 series.

Use of markers in seed purity, IP and molecular breeding: perspectives from industry

Dr Elizabeth Jones, Project Manager, Genomic & Opensource Breeding Informatics Initiative – GOBII, Cornell University, USA.

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Construction of maize haplotype map, transition from single genome to pan-genome reference

Dr Qi Sun, Director, Computational Biology Service Unit, Life Sciences Core, Laboratories Center, Cornell University, USA.

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Award

Dr Rajendra Sishodia, a student of University of Florida, USA, who did his research at ICRISAT Development Center received the Boyd-Scott Graduate Research Award at the 2016 American Society of Agricultural and Biological Engineers - Annual International Meeting. The award was for his thesis “Effects of irrigation withdrawals and climate change on groundwater dynamics in a semi-arid Indian watershed”. The award recognizes excellence in the conduct and presentation of research to build the knowledge base needed by engineers who design equipment, facilities, and processes for the sustainable operation of a biological system. Dr Sishodia was guided jointly by Dr Sanjay Shukla and Dr Suhas Wani during 2011 to 2015 under the existing collaboration between University of Florida and ICRISAT.

Welcome

Dr Jummai O Yila, joined as Scientist - Gender Research at ICRISAT-Mali on 1 August.

Dr Yila has over 13 years’ experience in research, project development and program management related to gender, forestry, community development, food and nutrition security, agriculture and climate change adaptation. She has worked extensively in sub-Saharan Africa and southeast Asia. She got her Masters and PhD in Gender and Development Studies from the Asian Institute of Technology (AIT), Thailand.

We welcome Dr Yila to Team ICRISAT and wish her all success.

Dr Hamado Tapsoba, a Burkinabe national, joined on 8 August as Project Co-ordinator for the Hope II Project at ICRISAT-Mali.

Dr Tapsoba has a PhD in Plant Pathology (1998) from the University of Georgia, USA. Prior to joining ICRISAT he was associated with the Collaborative Crop Research Program of the McKnight Foundation in Burkina Faso representing West Africa. He was also program assistant with the Japan International Cooperation Agency (JICA) from January 1999 to March 2005 and worked with The Hunger Project – Burkina Faso.

We welcome Dr Tapsoba to Team ICRISAT and wish him all success.
Sad News

Dr Eric Roberts, former ICRISAT Governing Board Member (1989-92) and Board Chair (1992-96) passed away on 17 August at the age of 86. He is survived by his wife Dorothy, two sons, and grandchildren.

Dr Ragnhild Sohlberg and Dr Stein W Bie, former Board Members and later Board Chairs pay tribute.

A world class scientist with solid management skills

“...was a genuine experience in seeing a world class scientist combining outstanding knowledge in the plant sciences with solid management skills, both in Europe and the developing world, with a great deal of diplomatic skills, and enormous amounts of good and creative humor. He made other board members contribute their best to the scientific advancement of ICRISAT and always had excellent relations with ICRISAT staff at all levels. He was good in updating the Board and staff on the latest from the global scientific field and made ICRISAT shine in the CGIAR community.

Representing ICRISAT at global and regional meetings earned him much respect among his peers. Although not afraid of entering into heated discussions on science and management, he always ended up rounding the whole debate off with apt and sometimes sharp remarks that usually settled the issue.

We both knew Eric well. After his departure from the ICRISAT Board, we continued to admire him. Even when his health deteriorated in later years, he retained his fabulous sense of humour and his quick comments to the very last.

We know that his work meant a lot to ICRISAT at critical times in its history, and we know that ICRISAT meant a lot to him.”

About Dr Eric Roberts

Dr Roberts started his career as a Senior Scientific Officer in West African Rice Research Station, Sierra Leone, and went on to take up teaching positions in Manchester University and Reading University, UK. He served as the Dean of the Faculty of Agriculture and Food, Reading University and Member of the Board of Governors, AFRC Institute of Horticulture, UK. He was awarded the Order of the British Empire (OBE) by the Queen for his services to agricultural research in the Civil Category. He was a Fellow of the Institute of Biology and the Institute of Horticulture, UK. He has authored more than 200 publications.