Making agricultural research for development work for the dryland poor

By the end of December 2014, I will be completing my 15-year journey into the limitless and uncommon opportunities for an inclusive and sustainable development in the drylands – tackling the challenges of poverty, hunger, malnutrition and environmental degradation, and fulfilling a dedication to serve poor rural communities of the world.

ICRISAT works in the dryland tropics covering 55 countries in Asia and sub-Saharan Africa inhabited by 2 billion people, 644 million of whom are the poorest of the poor. These marginalized people of the drylands are the hungriest and most nutritionally insecure in the
world. Extremely vulnerable to climate change with little rainfall, degraded soils and poor social infrastructure, the drylands create the deepest pockets of poverty on earth.

I was appointed ICRISAT Director General by the Governing Board in the year 2000, and have since channeled proactive and strategic thinking and management into making agricultural research for development (AR4D) work for the dryland poor. Bringing everyone on board – the ICRISAT team and development partners and stakeholders alike – we have strived to create opportunities to draw global attention on the vital role of AR4D in creating inclusive, science-based solutions to help empower dryland farming communities.

From a floundering institute in the late 1990s, today we have completely transformed ICRISAT into one of the best international AR4D centers in the world in terms of innovative research for development programs, scientific excellence, impact on smallholder farmers, and financial health and stability.

**Generating science-based solutions for the poor**

We are now faced with the enormous challenge to produce 70% more food to feed 9.1 billion people by 2050 using scarce resources amid the threat of climate change. Today, a billion people are hungry and about 3 billion are not eating well. Progress in achieving development goals (such as cutting hunger and poverty in half by 2015) has been delayed significantly, with the number of food-deficient people actually increasing in recent years.

There can be no doubt about the strong role of agricultural research in achieving development goals, with investments in agricultural research typically ranking first or second in terms of returns to growth and poverty reduction, along with investments in infrastructure and education.

Over the decades, ICRISAT’s AR4D agenda has been growing a pipeline of innovations and impacts that are changing the lives of the dryland poor on a large scale, showing high returns on social investment. In a 2014 *ex-post* impact assessment study of ICRISAT’s highly successful breakthrough innovations – which we call ‘Jewels of ICRISAT’ – a return on investment of US$70 on average for each dollar invested in AR4D, and an internal rate of return of 35% was generated.

These outstanding economic rates of return to investment illustrate ICRISAT’s core science and impact in overcoming the daunting challenges of the dryland tropics. These most successful ICRISAT initiatives include: 1) Drought tolerant groundnuts in India (Anantapur district), Malawi, and Nigeria; 2) Community-based watershed management in Lucheba, China; 3) Extra-early pearl millet hybrid in northwestern India; 4) Pigeonpea in northern Tanzania; (5) Fusarium wilt-resistant pigeonpea in India; 6) Fertilizer microdosing in Zimbabwe and Niger; and 7) Hybrid Parents Research Consortium (HPRC) on pearl millet and sorghum in India.

Our publicly available research, broad network of partnerships, and long experience in AR4D, and scientific excellence have made us well positioned to generate science-based solutions like the ‘Jewels of ICRISAT’ – intended for the poor, and contributing to the global effort to reduce poverty, hunger, malnutrition and environmental degradation, particularly in the dryland tropics.
Innovative resource mobilization

Like many research institutions in the late 1990s, ICRISAT had been hard-hit by the declining priority of agricultural research within international funders and donors, necessitating large budget cuts and morale-sapping staff reductions.

My role when I assumed office was to heal the rifts and forge a unified way forward. Transcending cultural boundaries, we were able to restore strong relations with countries that host ICRISAT in Asia and sub-Saharan Africa, and forge strategic public, private and civil society partnerships worldwide.

Over the course of 15 years, we have completely turned around ICRISAT into a financially-stable and a leading global AR4D institute. Through a strong and transformative governance and by introducing innovative AR4D agenda, we attracted much-needed support and have quadrupled the income and investments poured into ICRISAT by development partners, from US$ 22 million in 2000 to US$85 million as of 2014.

This has enabled the institute to rebuild its human resources, achieving a 50% increase in the number of scientists over the period. The improved capacity and morale translated into unprecedented achievements of our AR4D programs, and the corresponding impacts on our food security and poverty reduction goals.

We found encouragement and support to broaden ICRISAT’s donor base with the private sector and to mobilize new resources that are fully compatible with ICRISAT’s and the CGIAR’s public-goods orientation.

Today, ICRISAT’s three top donors, outside of the CGIAR system, are the Bill & Melinda Gates Foundation, India (the largest of any CGIAR host country), and the United States Agency for International Development (USAID). The Gates Foundation is funding three of the institute’s major AR4D initiatives: the HOPE project (Harnessing Opportunities for Productivity Enhancement of Sorghum and Millets); the Tropical Legumes II (TL-II) project; and the Village Dynamics in Southeast Asia (VDSA).

By reinvigorating resource mobilization, ICRISAT is now enjoying sound financial health and an energized team of scientists who themselves have become brand ambassadors moving the institute’s resource mobilization engine in the right direction.

Most importantly, financial stability enabled us at ICRISAT to fulfil our mandate of empowering poor, smallholder farmers in the drylands.

Key milestones and achievements

Over the decades, we have mainstreamed new management systems, strategic linkages with the private sector, innovative knowledge sharing schemes, and improved institutional visibility as integral parts of our AR4D initiatives.
We have institutionalized and nurtured a culture of scientific excellence in developing climate-smart and sustainable crop cultivars and technologies of our mandate crops – chickpea, pigeonpea, groundnut, sorghum and pearl millet – that are farmed by millions of smallholder farm families in the drylands.

Our Centre of Excellence in Genomics (CEG), a platform for modern breeding housing state-of-the-art facilities, is now known as a world leader in genomics research, mobilizing a global team in sequencing the draft genome of chickpea and pigeonpea. Our three-pillar approach to speed up crop improvement includes genomics, bioinformatics and phenotyping. In the last four years.

We have established the Platform for Translational Research on Transgenic Crops (PTTC), in partnership with the Government of India, to facilitate the translation of biotechnology concepts to usable products for the benefit of the farmers.

We have also established a Center of Excellence on Climate Change for Plant Protection (CoE-CCRPP), and a Center of Excellence (COE) in Information and Communications Technology (ICT) Innovations for Agriculture.

We have institutionalized an inclusive and technology-based entrepreneurship and agribusiness program, the Agribusiness and Innovation Platform (AIP), through public-private partnerships.

We now have a proven model for agribusiness incubation based on our 12 years of experience in setting up 22 agribusiness incubators in India, the same model that is now being adopted in setting up 6 incubators in Africa.

Our sustainable natural resource management model called Bhoochetana (land rejuvenation) has brought prosperity to resource-poor farmers in India. Using soil analysis as an entry point, soil nutrient recommendations were developed, demonstrated, and scaled-out to cover 5.5 million ha in 30 districts of Karnataka state, India, benefiting 4.75 million farming families, with an estimated net economic gain of US$ 240 million in four years. The model is now being taken to Africa and the Philippines.

**A vision and mission for a food secure and prosperous drylands**

Carefully re-examining the institute’s own strategic directions, we formulated the ICRISAT Strategic Plan to 2020, challenging everyone to be bold and imaginative and to build on past accomplishments and expertise in pursuing a new vision: A prosperous, food-secure and resilient dryland tropics through our mission to reduce poverty, hunger, malnutrition and environmental degradation in the dryland tropics.

Our strategy is anchored on a partnership-based AR4D focused on reducing hunger, poverty and environmental degradation in the drylands; and where the key opportunities lie for high-return investments for the public good.

The new strategic plan’s conceptual framework is a more dynamic institutional approach known as Inclusive Market-Oriented Development (IMOD) which shifted ICRISAT’s focus towards
enabling poor farmers to harness markets for poverty escape. This concept relies on unleashing the energies of the poor by enabling them with diverse, purposeful, innovative and action-oriented partnerships, more productive and resilient technologies, and supportive policies. IMOD is now being adopted by many centers and other organizations around the world.

To date, there is a number of successful IMOD cases illustrating what we need to do and change in order to become effective in helping hundreds of millions of desperately poor in the drylands.

Recently, we established the ICRISAT Development Center (IDC) to undertake large-scale uptake of science-backed technologies to benefit the smallholder farmers through on-the-ground impacts. IDC aims to bring smallholder farmers into the mainstream by adopting research for impact strategy with innovation, inclusivity, intensification and integration.

**The main drivers of transformation**

We embraced *Science with a Human Face* – doing science for the poor – as our inspiration and vehicle for institutional change. We laid out the process of institutional innovations, responsive to the rapid changes happening within the global AR4D environment. It was not anymore ‘business-as-usual.’ We steered ICRISAT to new heights through a culture of scientific excellence, decentralization, innovative resource mobilization and AR4D agenda, and a focus on impact and performance.

To achieve an enabling environment, innovative management policies and procedures were pursued where everyone works in the best conditions across the institute’s locations in Asia and sub-Saharan Africa. Giving high priority in empowering the team for greater productivity has become my earnest commitment.

Strongly believing in team-based culture – in working under a collaborative and cooperativespirit – we launched ‘Team ICRISAT’ to serve as a social force for organizational change. Through Team ICRISAT, we have boosted staff morale and enhanced organizational effectiveness and efficiency. It also encouraged our scientists and staff to team up with strategic partners from the public, private and civil society sectors to maintain the quality of ICRISAT’s science to benefit the poor.

I was confident that decentralizing management will enable the institute to derive positive synergies across all our locations, optimize research investments, and enable each location to act regionally and produce international public goods (IPGs) with global impact. ICRISAT’s management was decentralized from its global headquarters in India, devolving broad powers and authority to its regional hubs in Eastern and Southern Africa (ESA) and West and Central Africa (WCA).

In tackling the challenges confronting ICRISAT, I aimed to inspire everyone to embrace a strong commitment to service – an allegiance to the poorest of the poor of the semi-arid tropics who are our main beneficiaries. ICRISAT is now proud of its highly committed staff and partners, helping the institute to move forward during challenging times.
The pillars to the future of agricultural development

Not only in the last 15 years, but my lifetime career has been in agriculture and in developing country settings. From the accumulation of my experiences, I define four pillars that are key to upholding strong agricultural development. These are relevant for any country and include the following.

1. **Inclusiveness**: agricultural development must bring the farmers in to being part of the process to create the solutions.
2. **Science-based agriculture**: Science and technology have been the main drivers of advancements in agriculture and must continue. The farming decisions need to be based on good science.
3. **Resilient agriculture**: climate change is here and we have to build up our capacities to cope with this.
4. **Market orientation**: Agriculture must be viewed as a business and the focus should be on how to make farming profitable. Also to attract youth, farming must be seen as a business.

Sustainability must be a key value applied across all these pillars. We must not increase productivity if it is going to damage the environment. All advancements are a balancing act, but we must have the long-term vision in place and then nurture the progress every step of the way.

**Continuing the journey**

After an unprecedented three five-year terms (2000-2014), I hope to leave behind a legacy benefitting millions of farmers in India, Africa, and other dryland countries of the world.

The ICRISAT Governing Board has appointed Dr David Bergvinson as the next Director General of ICRISAT for a five-year term, effective January 01, 2015. Under his leadership, I am confident that ICRISAT along with our partners will surge ahead to generate and share cutting-edge global scientific innovations, to bring about genuine pro-poor growth and inclusive market-oriented development in the drylands.

I close by personally thanking Team ICRISAT, the ICRISAT Governing Board, our donors and partners, and all our stakeholders in the last 15 years for **making science and partnerships come together** to accelerate the pace of development in pursuit of a pathway to lasting prosperity in the world’s poorest and most disadvantaged regions – the dryland tropics.