Greetings from the CGIAR Research Program on Grain Legumes and Dryland Cereals (CRP-GLDC)!

It has been a year of both tremendous challenge and growth. Amid a global pandemic COVID 19, there has also been creative innovation, adaptation, and more inclusive research.

As you are aware, we are on the brink of completing three years of the CRP-GLDC. During this period, there have been lots of successes, challenges, and lessons learned. We were able to innovate and leverage science to achieve outcomes benefitting millions of people across South Asia, Sub Saharan Africa, Latin, and Central America. A significant impact was made in the cross-cutting areas, besides enhancing capacities of scientists and farmers, and establishing the roles of gender norms and social change in technology adoption and distribution of benefits through our gender research.

This newsletter attempts to document and disseminate the global impacts that the CRP-GLDC has created during 2020.

We thank you and appreciate your efforts in supporting the activities of CRP-GLDC in 2020 and looking forward to your active participation and sharing of information in 2021.

Best wishes for the New Year!

Kiran K Sharma
Director
CRP on Grain Legumes and Dryland Cereals

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**What`s inside?**

1. **Maximizing for CGIAR multi-indicators**
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2. **Adaptive initiatives: Informing post-pandemic recovery roadmaps**
   - FP3: Integrated Farm & Household Management

3. **Food & feed intervention delivery: networks and learnings**
   - FP4: Variety & Hybrid Development

4. **Publication prolificacy**
   - FP5: Pre-breeding and Trait Discovery

5. **Closer CRP integration: Beans for impact**
   - FP6: Common Bean for Markets & Nutrition

6. **Progressive innovations**
   - Nutrition; Biotic stress; Heterosis

7. **Collaboration for Open Data Day 2020**
   - Open Data Day 2020

8. **Encompassing aspects**
   - Events and Knowledge products

**Note:** Items with hand cursor icon are linked to full material
Maximizing results for multiple CGIAR indicators

Capturing R4D results from the activities via CRP–level reporting is in a form harmonized to the CGIAR–level performance monitoring. Here, we learn how results from an FPI work theme is packaged against several CGIAR indicators with high–quality evidences. This will not only help the research team realize the scale of their results, but also make aggregation to overall CGIAR performance more efficient.

Model case: Impacts of cowpea farm interventions in Nigeria

**Indicator: Contribution to CGIAR SLO’s**

<table>
<thead>
<tr>
<th>SLO Target</th>
<th>CRP-GLDC Contribution</th>
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<tr>
<td>SLO 1.1: 100 million more farm households have adopted improved varieties, breeds, trees, and/or management practices</td>
<td>A nationally representative sample survey of &gt;1,500 cowpea producing households showed that over 40% of the cowpea producers (equivalent approx. to 900,000 households) adopted improved varieties on over 1 million hectares of land.</td>
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<td>SLO 1.2: 30 million people, of which 50% are women, assisted to exit poverty:</td>
<td>Adoption of improved cowpea varieties led to a 17% increase in household income, a 24% increase in asset ownership, and a 5% reduction in the incidence of poverty, which is equivalent to 929,450 people lifted out of poverty due to adoption of improved varieties.</td>
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<td>SLO 2.1: Improve the rate of yield increase for major food staples from the current &lt;1% to 1.2–1.5% per year</td>
<td>A nationally representative sample survey of over 1,500 cowpea producing households showed that adoption of improved varieties was associated on average with a 26% increase in yields and 61% increase in net returns per hectare</td>
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More indicators

**Impact story**

- MELIA Study
  
  An ex–post study was conducted on the impacts of improved cowpea varieties on yields, incomes and poverty in Nigeria. A paper on the yield and income effects of improved cowpea has been published in the Journal of Agricultural Economics and another paper on the poverty impacts of improved cowpea has been published in World Development.

- Innovation
  
  This METHOD for assessing poverty reduction due to adoption of improved varieties involves a comparative evaluation of poverty headcount ratios based on the observed and counterfactual income distributions with and without technology adoption where the size of the income effects of adoption is first derived using endogenous switching regression techniques.
Adaptive initiatives: Informing post-pandemic recovery roadmaps

The ongoing COVID-19 pandemic has severely impacted global agri-food systems along with all sectors. Here we feature publication and opinion pieces from the CRP-GLDC FP1, and FP3.3 (identifying criteria and indicators for analyzing sustainability that could be applicable across the farming systems in the regions, and finding common and region-specific indicators, and then quantifying them for a set of GLDC-specific options). These pieces can inform development of locally-contextualized policies for post-pandemic recovery roadmap. Each of the title snapshots in this section are linked to the source for full details.
Food & feed interventions delivery: expanding networks, & strategizing from learnings

As a crop-based program, CRP–GLDC products from the crop breeding pipelines are handled by the clusters for (a) product testing and release and (b) science of scaling technologies. With the scale of implementing these activities, FP4 team capitalizes on building, expanding, and strengthening partnerships through multi-stakeholder crop network groups (CNG). **Successful model in Asia, is being optimized for East and Southern Africa.** Images are hyperlinked to full material.

The Crop Network Groups–Asia is a platform for product design, efficient breeding strategies, partnerships for site testing and adoption by farmers as well as for continuous exchange of knowledge and capacity building. the group will help concentrate the efforts to develop and disseminate varieties with desirable, market-friendly traits that can improve nutrition and enhance incomes in the **Asian countries.**

With lessons from CNG–Asia, a group of agricultural scientists and other value chain actors, such as processors and seed business houses working with sorghum and millets, came together to create a platform – a Crop Network Group (CNG) – to stimulate crop product design, development, testing and delivery in **Eastern and Southern Africa.**

Among the products of collaborative work in form of CNG’s is the development of **target population of environments (TPE’s)** for crops.

**Strategies**

- **Sowing Legume Seeds, Reaping Cash**
- **Strategic Framework to Foster Grain Legume and Dryland Cereal Seed Systems Innovations**
- **ILRI feed technology research platform makes more fodder available to developing-world livestock keepers**
- **Livestock & GLDC**
- **Updated CGIAR feed database provides best-cost livestock feed rations for sub-Saharan Africa**
- **No such thing as waste: full-purpose crops a double boon for people and livestock**
- **Fodder chopping machines lead to a thriving livestock feed enterprise in rural Niger**
Publication prolificacy: FP5 tools & knowledge feeding into variety & hybrid development

In 2020, the prolificacy of FP5 in publishing (n=40 journal articles so far) can inspire the entire CRP-GLDC community to produce and report to MEL knowledge products, especially legacy materials. The work by three FP5 clusters feed into variety and hybrid development work. FP5 journal articles with four highest Altmetric scores are highlighted, and the rest accessible here: http://gldc.cgiar.org/publications/.


For all knowledge products, including journal articles, Altmetric valuing can now be calculated. High “Mentions” are generally paired with a similar high Altmetric score while the ‘Readers’ value is almost independent. While there is a strong relationship between Twitter, Facebook and Mendeley, the blogs and news are less evident and require more communication effort. Click on the Altmetric donut beside for tips.

Innovations and new discoveries

Soil-borne pathogen new to chickpea growing regions in India detected

Reprogramming signaling hormones to address Striga problems

Rapid generation advance technology & facility to revolutionize breeding

Targeting photoreceptors to manage photoperiod-sensitivity in pigeon pea
Common Beans: Closer integration into CRP-GLDC, delivering impact

In 2020, the full integration of the flagship program on Common Bean into CRP-GLDC was in focus. FP6 aligns its planning and reporting to CRP-GLDC processes, and the CRP-GLDC impact pathway is currently undergoing review to cater to synergies with other FP’s and cross-cutting themes taking advantage of the successful PABRA network as model on partnerships. FP6 has helped strengthen CRP-GLDC policy contributions, and an impact story on beans in Rwanda which was picked into the CGIAR Report.

 FP6 Policy contributions

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<tr>
<th>Revision of the Burundi memorandum/strategy to enhance the consumption of beans to include promotion of high iron beans</th>
<th>Burundi: Country strategy that enhance the consumption of beans and dry bean products facilitated with CIAT’s support their memorandum was reviewed towards continually promoting high iron beans</th>
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<tbody>
<tr>
<td>Crop biofortification technical guidance in Uganda</td>
<td>Country strategy championed by NARO–Bean Program which is a member of PABRA facilitated by Alliance of Biodiversity and CIAT facilitates the increase in the consumption of beans and bean products.</td>
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<td>2nd Uganda Nutrition Action Plan (2020–2025)</td>
<td>This plan contributed to the development of the Country strategy that includes intensifying production of bio-fortified crops to address micro-nutrient gaps among women and children.</td>
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<td>Zimbabwe National Food Fortification Policy</td>
<td>CGIAR especially CIAT–PABRA through the national the government Department of Research and Special Services (DR&amp;SS) influenced the policy makers to develop and enact food fortification policies.</td>
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<tr>
<td>Zimbabwe National school feeding programme</td>
<td>CG especially CIAT–PABRA through the national the government Department of Research and Special Services (DR&amp;SS) influenced the policy makers and mainstreamed the use of nutritious food in school feed programme.</td>
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<tr>
<td>Zimbabwe Command Agriculture</td>
<td>The CGIAR especially Alliance of Biodiversity and CIAT–PABRA Project, through the Zimbabwe national government Department of Research and Special Services (DR&amp;SS) influenced the policy makers to increase agricultural productivity.</td>
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Climbing bean technologies helped 0.8 M farming households increase productivity and food security, resulting to about 5,000 households climbing out of poverty in land-constrained Rwanda.

Bean growers in Rwanda often have less than a hectare to maintain a family. An ex-post impact assessment demonstrated that adopting households reap benefits from the climbing beans introduced by the international Center for Tropical Agriculture and the project, Pan African Bean Research Alliance (PABRA) more than 20 years ago as a means to intensify bean cultivation. Approximately 4.4 million people have raised their consumption expenditure, bean consumption and food security, while 0.6% of them are lifted out from poverty.
Progressive innovations for nutrition & industry demand, biotic stress, & heterosis for yield

Aside from reporting on new outputs/results, it is highly recommended to also highlight growth of previously low-maturity innovations to demonstrate continuity of returns on CGIAR investments. Here we present innovations demonstrating progress on innovation growth from breeding to scaling, capitalizing on enabling technologies, and strong network. Featured cases are on high-oleic groundnut, genomics-assisted superior chickpea development, and hybrid parent consortium for sorghum.

**Groundnut high oleic introgression**

High oleic groundnut is preferred by food industry for shelf-life benefits, and consumer health benefits. Genotyping for selection of FAD2A and FAD2B mutant alleles, and robust-phenotyping using Near Infrared Reflectance Spectroscopy (NIRS) enabled introgression of ‘high oleic’ trait in Spanish and Virginia Bunch backgrounds. The fast track development is possible through reduced generation interval using low cost methods, and early generation and multi-location testing data enabled line advancement decisions.

The process innovations in breeding and testing pipeline resulted in commercialization of high oleic cultivars in India in 8–years of time as against the normal 12–15 years thanks to extensive testing network. Marker Assisted Selection (MAS) and Marker Assisted Backcross (MABC) approaches were used for early generation selection of FAD mutant alleles. Girnar 4, and Girnar 5 are high–oleic Virginia Bunch varieties with more than 80% oleic acid content, and are the first high oleic commercially released cultivars in India. Girnar 5’s average pod yield is 3,147 Kg/ha in national trials.

**Breeding pipeline: High oleic groundnut**

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**Private-public work to scale**

Industry plans to reach consumers with high oleic groundnut in 3–years (4–years if slow maturity varieties). The process innovations in breeding and testing pipeline resulted in commercialization of high oleic cultivars in India in 8–years of time as against the normal 12–15 years thanks to extensive testing network. Marker Assisted Selection (MAS) and Marker Assisted Backcross (MABC) approaches were used for early generation selection of FAD mutant alleles. Girnar 4, and Girnar 5 are high–oleic Virginia Bunch varieties with more than 80% oleic acid content, and are the first high oleic commercially released cultivars in India. Girnar 5’s average pod yield is 3,147 Kg/ha in national trials.

**High-impact launch**

Indian PM Narendra Modi dedicates two hundred of groundnut varieties on World Food Day

**Variety delivery**

New CGIAT groundnut varieties to be available from the next season, and variety demo events.

**Opportunities**

To anticipate the 2020 reporting, innovations can already be reported in MEL following the guide linked in the presentation snapshot. Aside from reporting new innovations, matured innovations that build on previously reported cases are also encouraged. A reporting refresher webinar will also be held in 2021 Q1.

Please coordinate with CRP-GLDC PMU to develop communication materials e.g. posters, fact sheets, and blogs. Your materials can also be promoted through CRP-GLDC social media, and News in the CRP-GLDC website.

**Sorghum Hybrid Parents Research Consortium**

ICRISAT and local seed companies to build a seed industry for supply of high performing hybrids to small holder farmers

**Zimbabwe: New market-preferred Sorghum hybrids**

New sorghum hybrid with preferred market traits developed in partnership with Zimbabwean seed company

**Wilt-resistant Chickpea**

A high-yielding and wilt resistant variety with a yield potential double to that of existing varieties was developed through genomics-assisted breeding and released for cultivation in the states of Madhya Pradesh, Gujarat and Maharashtra by the Central Varietal Release Committee, Government of India.
Working with other CRPs & CGIAR Centers for #ODD2020

In celebration of the 10th International Open Data Day (ODD) Anniversary, CRP-GLDC co-produced a campaign together with CRP-RTB, CRP-FISH, International Potato Center, and WorldFish Center via landing page. CRP-GLDC scientists shared insights and testimonies on the importance of open data to advance science and deliver interventions, and the role of centralized platforms e.g. MEL Platform to achieve this goal.

Parallel ODD 2020 Campaign by ICRISAT
Encompassing events and knowledge products

EVENT: DryArc campaign on World Food Day 2020

DryArc – Time to Grow, Nourish, Sustain, Together
Oct 16, 2020

World Food Day is an opportunity to reflect on how we can join forces to support vulnerable communities who struggle to put food on their table every day. DryArc, a CGIAR initiative targeting water-scarce regions, embraces the new ways of thinking, digitisation etc... read more

EVENT: International day of rural women

Youth or Young mothers? the paradox of transitions in the rural women’s lives
Oct 15, 2020

2020 is a unique year. We have spent most of it “surprised” by the turn of events. In early 2020, we found ourselves in a global health pandemic. We started by learning that we could not travel from one country to another. As first, we thought it will be a few weeks... read more

Encompassing knowledge & aspects

Trade-offs along food value-chains: anticipate the unintended for better food and nutrition security
How to achieve Sustainable Development Goal no. 2. Zero Hunger, by 2030 Ambitious Food value chain initiatives pursue multiple development objectives of reducing poverty, malnutrition and environmental footprint by increasing smallholders’ productivity and incomes... read more

Transforming agri-food systems for the Sustainable Development Goals requires honest discussion on trade-offs
Oct 16, 2020

Researchers argue that trade-offs in value-chain interventions need to be explicitly recognised within the wider agri-food system to achieve the Goals, suggesting a “no harm” agenda. Managing trade-offs in agri-food systems for outcomes that do no harm is central... read more

Why measuring youths’ aspirations is key to sustainable and inclusive rural development
Mar 24, 2020

Especially for young people, diverse portfolios for rural population should be the core part of a well-thought out rural investment strategy, say researchers. The first results of the Kenyan census conducted in 2019 reveal a gradual demographic transition towards... read more

One CGIAR Global Webinar Series on Genome Editing in Agriculture: Innovations for Sustainable Production and Food Systems

The #OneCGIAR Community of Practice (CoP) for Genome Editing in Agriculture is now on! Announced yesterday by Dr Marco Ferroni at the launch of #GlobalWebinarSeries on Genome Editing in Agriculture.

More details:
kiist.org/event/one-cgia...
@CGIAR @USAID @conterva @gatesfoundation

Speakers profiles & abstracts

Webinar 1 Webinar 2 Webinar 3

Webinar 4 Webinar 5

CGIAR focus on gene editing crops for a food and income secure future
We offer a short survey to know your thoughts on this newsletter, and also help develop the next releases.

Click the green bar below. It takes only 2 to 3 minutes.

http://gldc.cgiar.org