

Flagship on **Variety and Hybrid Development** of CRP-GLC

Reporting back from 27th Nov 2019

Objectives:

Research priorities 2020 in consultation with partners

Cross-cutting initiatives embedded in research priorities

At least 2 areas to be identified for integration across FPs

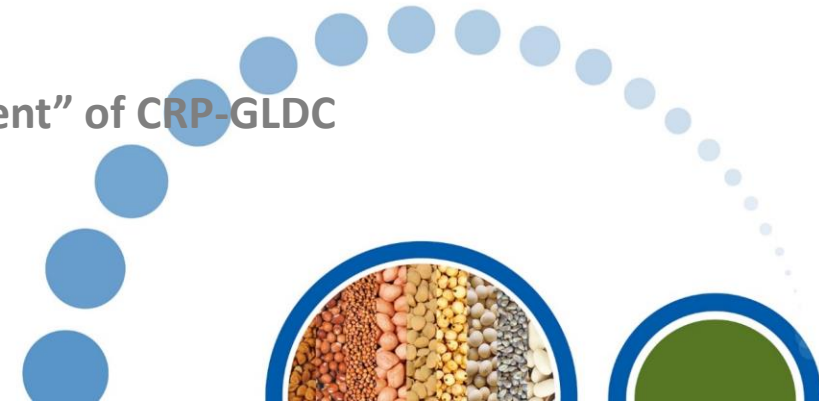
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Culture @ GLDC

Flagship on 'variety and hybrid development

TPE's

Product Profiles

Process innovation in breeding and testing pipeline

Operational efficiency

Outputs – cultivars, knowledge generation and capacity building

Establishing benchmark and monitor progress, genetic gain assessment

Delivery & research on what works? And didn't work.

Process:

- **FP4 and FP5 teams will go together for consultations with partners and other FPs and cross cutting activities.**
- **The FP4 team has identified some broad areas to seed feedback and plan work with other FPs and cross cutting activities**

1. What are the target countryxcropxtrait priorities for 2020 and beyond? Is there a change in what was prioritized by GLDC?

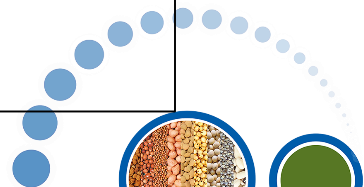
As presented by the FP1 leader, Arega that there is not much shift in priority in crop, country and trait Matrix. Therefore, no change in priority was suggested.



Consultations with Partners

International nurseries are one of the research priority for FP4 in 2020; key for enhanced engagement with NARS

- ✓ The model practiced at ICARDA was discussed, where **centralized systems** is adopted for seed increase, receipt of indents, distribution, data and feedback receiving and analysis.
- ✓ NARS from India suggested the possibility of sharing **nurseries developed by NARS in India under south-south collaboration**. Some crop programs have adopted a method of accessing these nurseries by embedding them in their national level systems trials.
- ✓ In PM the international nurseries evolved into partnership trials between ICAR and ICRISAT. Also discussed about possible utility of **WCA material in A1 zone of India**.
- ✓ Sharing of nurseries in a **coordinated manner in the stage gate system will add value to the breeding programs**. It was suggested to involve NARS partners in the stage gate so that they receive the right product as prescribed in the breeding product profile.
- ✓ **NARS and Private sector noted the benefits from these nurseries**. In case of Hytec seeds all the parental lines of Sorghum were from ICRISAT.
- ✓ Focus on **receiving data** from the partners was discussed. **As a whole everyone agreed on importance of international trials and nurseries are critical for attaining targeted genetic gains. How to manage the IN nursery data is also very important to add value for incremental improvement.**
- ✓ **Indian NARS is also looking for Common bean and cowpea. Similarly Myanmar interested minor millet germplasm .**



Consultations with Partners

3. Did the partners use HTPG platform in breeding? Another key area where we can engage with NARS actively.

- ✓ NARS partners began to use HTPG platform, **variable across crops and regions**
- ✓ This is a **good input from the FP5 team to FP4 team for early generation selection.**
- ✓ Some users noticed about less communication from platform. It looks HTPG is going to finish its operation and soon this activity will be handled by EiB.



Consultations with Partners

4. Ideas around phenotyping platforms? What phenotyping is most critical? Key area for engagement with NARS.

- ✓ **Drought phenotyping** is important.
- ✓ Realized that **LysiScan** suitable only at early crop growth stage.
- ✓ **Phenomics facilities with Indian NARS** were discussed. Also, discussed about possible use of abiotic screening facilities available with ICAR-NIASM.
- ✓ Breeders screen large number of lines and it would much more appropriate to use **hand-held device** like the one developed by University of Michigan for initial screening which would later be confirmed through precision phenotyping.
- ✓ **Phenomics facilities established at various ARIs and NARSs can** be leveraged for use rather than establishing new facilities.
- ✓ **Imaging technologies** are also being used for phenotyping sorghum by some NARS partners (Senegal, etc.,) using drone. It is good to use these technologies but more emphasis at this stage is required in mechanization of **field operation to reduce the variability** which if not taken care of will mislead the images.



Consultations with Partners

- ✓ **Grain quality**, capacities, infrastructure, wet chemistry. Deliberated on XRF vs ICP in terms of high throughput vis-a-vis precision screening.
- ✓ **Agreed on capacity of stakeholders on nutrient analysis with the help of Harvest plus during 1st quarter of 2020**
- ✓ Reliable **Frost screening for CP** in Northern India is needed.
- ✓ Need for strong phenotyping facility for **insects in ESA**.
- ✓ Also emphasized the need for **good and precise data capture to take full advantage of good tools**. **Multi-year and location average** is needed to confirm the high value of micro nutrients as they are highly influenced by the sampling and environments.
- ✓ There is also a need to streamline the **post-harvest destination of biofortified products** so that the producers and consumers are profited from the products based on informed decisions. This is where the studies taken up under FP1 could help to leverage the work undertaken in FP4 and FP5.



Consultations with Partners

5. Expectations around TPEs?

- ✓ **Inclusion of soil** factors in TPE characterization discussed.
- ✓ There is a need for classification of the environments for better targeting the product testing.

6. Expectations on crop network groups and capacity building

- ✓ **Sustainability** is key for post-GLDC.
- ✓ Discussed about successful model of HPRC. ASARECA in ESA agreed to sustaining sorghum and millets crops network.
- ✓ **Valuable.**



(B) With FP1 team and MPAB: 11:45 noon to 1:00 PM & 2:00 PM to 2:30 PM (we may get some time form lunch break, if everyone agrees and depending on the need)), & Esther is joining this team.

Four areas of work were prioritized by FP4 team for 2020 & 2021 based on the outcome of the 'evidence framework workshop" and FP4 team would like to deliberate on how FP1 team plans to deliver them for GLDC?

High impact activities for 2020 that FP4 team would want FP 1 team to take up and will work with FP1 team; the activities, given the nature will be led by FP1 team member. Identification of activities will be based on the workshop on “Evidence Framework for CGIAR Research Program on Grain Legumes and Dryland Cereals (GLDC)” and the proposed activities by Karl Huges (CoA 1.4 leader) & Alena Arega (FP1 leader). The following are proposed for discussion:

1. Review and synthesize all relevant adoption data, so we can provide a responsible estimate of the likely extent (people and ha.) of GLDC crop (and hopefully mgt. practice) adoption.

FP team has an activity in 2020.



2. At least one impact study on the extent the promotion of GLDC crops improves diets

The FP4 team proposes a desk-work first to study the available studies and document them, the studies from FtF innovation labs can be valuable. The following two areas of study are prioritized by the team.

1. Adoption study in Bangladesh revealed that 98% of area is under biofortified lentil variety. A study on impact of biofortified lentils on nutrition may be a good one.
2. GLDC crops in diets and contribution to nutrition: FM and PM are crops of high nutrition particularly Fe and Zn. A study on contribution of FM and PM based diets on nutrition will be valuable for GLDC narrative on the nutritional benefits of the GLDC crops. Similarly, Sorghum in ESA countries like Tanzania, Ethiopia or Uganda and in WCA countries, Nigeria, Mali or Burkina will be a good study.

FP1 and FP4 agree on generating evidence on consumption of GLDC crops (and/or biofortified cultivars), nutritional impacts and bioavailability studies. Need to further discuss on which cropXcountry.

Link between GLDC crops and nutrition to be established with evidence. Different models for efficacy trials are available and the one suitable for a particular situation needs to be adopted for such linkage.



3. Market survey on market segmentation and potential demand to guide product profile design

- ✓ Groundnut & Sorghum for both Tanzania and Nigeria by co-working with AVISA.
- ✓ Sorghum and PP In SA under additional activities.
- ✓ Market preferred traits with economic value and gender responsive traits need to be integrated in the breeding product profiles. Modeling approach to add value to FP4 and FP5 in terms of economic trait prioritization is needed.
- ✓
- ✓ FP1 team is keen to adopt a structure common framework for this kind of work across the cropxcountry. For including new activities on market studies in 2020 to feed the design of PPs, FP1, FP4 and CRP-Director to discuss regarding resources.

Was done with NARS in Myanmar and India



4. Scoping study to understand Private Sector Business model for well endowed environment is applicable for the Public research institute working for less endowed and poor area (Reference: Appendix 4 on evidence gaps of workshop document. Node: 1 Market and farmer demand; priority: high).

A study in India showed that private sector is not interested in A1 zone for PM as it is a very low input-environment. What are the risks in adopting the business models of private sector that are successful in well-endowed agro-ecologies for low-volume hybrid crops to the public sector product that operate in poor agro-ecologies and also deal with high volume, OPV's. Marketing is key driver. The private sector has strong Marketing and the success is based on that, what is the feasibility in investing in marketing by public sector and how to go about with it? There is strong appetite from the donor to adopt the business model of private sector to achieve scale of delivery. However, donors have not done this scoping study, the recommendation seems to be ideological and not based on data-driven evidence. A scoping study can be linked with AVISA and for Tanzania and Nigeria we can also partner with Syngenta Foundation.

MPAB will be able to take up this activity and need further discussion by MPAD, FP1, FP4 and CRP-Director to discuss regarding resources. MPAB and FP1 with inputs from FP4 will be able to design such a scoping study. We need to see if some bilateral funds can support this.



2. FP4 expects that the **narration of IFPRI contested** with data as it drives the investment of CtEH and have consequences to investment in GLDC's crop improvement programs (thus consequences to the FP4 and FP5 work)

FP1 team will submit a MS in 2020.

3. Can FP1 team study the **successful seed systems models in Myanmar (CP) or Bangladesh (Lentil) or India (all legumes in seed hub model)** to understand **what elements made it successful to reach out >95 area** that is unthinkable for legumes in our priority countries. This builds a case study better than the example from private sector or private finance sector.

Interesting to MPAB and Gender to engage with this work.



6. Plant based meats?

Interesting conversations and future potential for leguems and cereals.

MPAB team is looking at teh opporutnity with pigeon pea in Malawi.

7. Systems dynamic economist from MPAB will discuss regarding on going scenario work on emerging traits.

The future market traits modeled to get an economic value of the trait and a gender dimension of the trait (if application for that trait). Rancidity in PM and high oleic in GN were picked as potential traits for the study.



Gender specific questions.

Can we study the role of youth and gender in the successful seed models of Myanmar (CP) or India (seed hubs for all legumes)?

Soybean new variety with high protein driving women and youth enterprises.

- Gender dynamics in seed systems, already an activity in FP4 conducted with Universities .
- Youth strategy
- Feedback on gender traits to crop Product Profile
- Benefits of technologies to gender – ex: easy snapping trait in Finger millets



Capacity Development: Thomas: 2:30 PM to 3:00 PM

Understand about the capacity building and what the FP4 team can do for better metrics of CapDev and also organize CapDev activities .

Any other?

Action plan for FP4 team:

- ✓ FP4 team to revisit the activities and see if they can be mapped to the one or more **element of the CapDev** ((1) Development of partnerships (2) Organizational development (3) Institutional organization)
- ✓ **E-learning platform: FP4** team to provide information from trainings etc. to this platform
- ✓ **Student's work to be fully reported on MEL. The students are from various universities and represent next-generation. This is a key activity for our engagement with NARS.**
- ✓ Conversation around **technician training** – both at NARS and CG. Joint programs?



D) With FP3 team: 3:00 to 3:30 PM

Can we build evidence on contribution of improved legume varieties in intercrop or crop rotation to soil nutrient sustainability and environmental sustainability?

Opportunities where the improved seeds and component technologies can be delivered together. Examples?

Any other.

- ✓ Impact of adoption of GLDC varieties on NMR – a conversation between FP1, FP3 and FP4...**developing story**
- ✓ **Climate change impacts on GLDC** crops will a valuable feedback to the product design
- ✓ Evidence on **GLDC crop's contribution to the NMR based** on the literature available – it will be an activity in 2020.



With FP5 team:

- Quality Control (QC)
- Prebreeding material and **wild relatives for traits not available in the cultivated germplasm** is required across the GLDC crops by NARS partners. Those not **crossable need to be focused**.
- Some examples were discussed: Example of wide cross with *Cajanus platicarpus* carried out successfully by ICRISAT in the past was mentioned as this species offers many desirable traits like photothermo-insensitivity, earliness, insect resistance in pigeonpea. Similar efforts for frost tolerance in chickpea and lentil are also needed.



New activities for 2020

CoA 4.1: TPE's

CoA 4.2: GS in PM (SA), deploying SNPs and other new activities in GN (ESA), and CMA in PP (Asia).

CoA 4.3: MLT sites for 5 crops in two countries of Asia, MLT sites for PP in three countries in ESA

CoA 4.4: included seed systems in two crops in 2 countries of ESA and three crops in India and two crops in Myanmar, and an exploration study on seed distribution chain for two crops and two countries in ESA.

Across CoA's: CNG's are a good activity, need to see if some support is needed for some crops and regions, in Africa most of the crops is taken care by AVISA.







Thank you for your
attention.

