EiB support for modernisation in 2020

Michael Quinn - EiB Director

EiB Annual meeting, Amsterdam November 6th 2019

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How to achieve the vision from Technical perspective

- This EiB annual meeting has previously been used to better understand where and how EiB can support you – Right now we a clearer understanding of this through extensive engagement via development of improvement plans

- Looking at the vision presented there are clearly many discussions, tools, services and transfer of know-how that will be required

- This meeting is more about the need for active and effective sponsorship and coaching and less about the technical aspects of driving toward the vision

- We do need to have the technical discussions also. They're included in the EiB 2020 work plan

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Focussed and scalable approaches to supporting change

- In our role of leading, coordinating and supporting change, we will work in a very focussed and targeted way with a number of programs to support implementation of prioritised changes as indicated through your improvement plans.
- ➔ This will involve EiB working intensively with you to implement agreed changes

- EiB will also have scalable approaches to support changes. These will often take the form of development and deployment of tools, services and training / know-how / consultancy

- So first, the scalable approaches…

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Product design / Product management

- Improved version of product profile tool, with users manual and online training. Available by the end of March.
  - Enabling each CGIAR and NARS breeding program to develop a high quality product profile
- BPAT for animals, fish, forestry and forages
- A global product management network established
  - Will coordinate across existing capacity and new capacity funded by CtEH
- That alignment between breeding decisions and the product profile will be achieved through the incorporation of product profiles into the Enterprise Breeding System

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Optimisation of breeding schemes

- Tool for documenting and describing breeding schemes
- Simulation tool, with manual and online training, available to all CGIAR and NARS breeding programs to enable simulation of alternative breeding schemes/decisions. To be used for optimisation of breeding schemes
- Quantitative genetics, simulation tool and breeding scheme optimisation training (Amsterdam)
  - February
  - July
  - September
- Tools, methods for genetic gains assessment, h^2, and for defining and assessing the target population of environments (TPEs).
  - Delivered through training workshops
    - When and where??
  - Tools, manuals and online training available through toolbox

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Genotyping and sequencing

- Sampling training
  - East Africa; January
  - West Africa; May/June

- Access to high quality, low cost genotyping low, mid and high density services brokered for CG and partner breeding programs
  - Mid density becoming available for $10/sample for all priority crops (full service, inc. DNA extraction)
  - Forward MAS (10 markers) $2/sample (full service, inc. DNA extraction)

- Integration of genotyping workflows into EBS (2021 completion)

- Continue to look for opportunities to drive down cost of genotyping
  - Through increasing volume
  - Working with Vendors – How can we be better customers?

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Breeding Operations and Phenotyping

- Training;
  - Continuous improvement methods
  - Cost analysis of all areas of breeding operations
  - Irrigation methods
  - Soil management
- Access to high quality, low cost quality/nutritional/physico-chemical analysis through aggregated demand and use of centralised shared service
- Digitisation of breeding processes and operations (supported by CtEH)

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Data Management and Bioinformatics

- Development and maintenance of key data management systems
  - EBS (including B4R, sample tracker, etc.)
  - BMS
  - GOBii
  - BreedBase (not funded by EiB)

- Development of key metrics for defining optimum use of data management systems

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Biometrics

- Standardized and effective experimental design and analysis tools implemented in EBS

- Training for use of EBS experimental design and analysis tools

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Moving to intensive interactions to support change

- That concludes the scalable approaches, so now the focused and intensive approaches

- To provide more intensive interation supporting implementation of changes this can’t be applied to every CGIAR and NARS program immediately; therefore, prioritization is required

- Sticking with the data driven approach, a list of priority crop by region combinations has been developed based on ability to alleviate poverty and the 2018 IFPRI analysis

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Funders' Priority Crops

Crops with highest poverty relevance Large gaps in breeding programs	IITA: Cassava, Yams, Maize, Plantain ICRISAT Africa: Sorghum AfricaRice: Rice
Crops with highest poverty relevance Smaller gaps in breeding programs	IRRI Rice for Asia CIMMYT Wheat for Asia CIMMYT Maize for Africa
Crops important for diversification Smaller breeding programs that need strengthening	Legumes, Banana, Sweet potato and Millets for Africa Potato for Africa & Asia Cassava, Chickpea, Maize for Asia Maize for LAC, Wheat for CWANA

Capture >70%
Capture >90% of the poverty weighed gross value of crop production (GVCP)

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Product design / Product management

- Support priority crops to:
  - Refine and validate target product profiles
  - Establish a high quality annual germplasm advancement meeting
  - Establish a product management network (supported by CtEH)

- **GPK to confirm the above applies or CIMMYT wheat since I've said it is for priority crops yet it isn't in the work plan**

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Optimisation of breeding schemes

- Alternative breeding schemes simulated and feasibility discussed considering logistical, biological and organisational constraints resulting in a plan developed for optimisation of breeding schemes
  - For priority crops

- Review and make recommendations to CIMMYT wheat breeding in areas of:
  - breeding scheme
  - parental selection, and,
  - trialing network

- Support to accurately and fully define and document breeding schemes and and desired modifications to reach targets
  - For priority crops

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Genotyping and sequencing

- Support AfricaRice and IRRI to develop and implement a unified trait deployment strategy
- Develop business plan for genotyping coordinator role for rice
- Support routine application of QC and MAS for:
  - IITA Maize and Cassava
  - AfricaRice and IRRI
  - CIMMYT Maize and Wheat
- Implementation of mid density panel for GS proof of concept and fingerprinting for maize, wheat, rice and cassava

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Breeding Operations and Phenotyping

- Support priority programs to fully and accurately cost all their breeding operations
- Develop irrigation and soil management improvement plans for 3 key IITA stations
- Support implementation of operational excellence methods and processes for priority crops
- Support CIMMYT Wheat to develop a high level plan for breeding operation and trial management improvements
- Conduct opportunity analysis and develop recommendations for Breeding Operations and Phenotyping improvements for AfricaRice and IRRI
- Develop recommendations for abiotic stress, irrigation and soil management for CIMMYT maize Africa trials and nurseries

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Data Management

- Advancement meeting templates developed for breeding programs using BrAPI enabled breeding systems
- Advancement meeting template tested by IITA cassava, musa, yam and ICRISAT sorghum programs

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For National Programs

- Baseline assessments conducted for:
  - NARO: rice , maize, cassava, sweet potato, musa and groundnut
  - KALRO: maize, bean, potato, maize, wheat, rice cassava and musa
  - ICAR: rice, wheat, chickpea, and pearl millet
- Develop high level plan for CSIR, NARO and KALRO breeding operations and trial management improvements

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Other key areas still being determined

- Working more effectively with partners
- Development of and extracting value from shared services
- Key metrics and performance indicators (for teams and for individuals)
  - For desired breeding outcomes (e.g. high value germplasm)
  - For implementation toward the vision for CGIAR breeding

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Thank you!

Questions / Discussion

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