



# **Overcoming hurdles to change, a day in the life of a NARES breeder: Experience in NARO**

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**Virtual EIB Annual Meeting - 16-19 November, 2021**



# Presentation outline

- Case study of overcoming barriers for successful implementation of an aspects of breeding modernization:
- Journey towards breeding and operational excellence
- Barriers to breeding modernization
- Overcoming the barriers
- Experience and lessons learned for other programs
- A day in life of NARES breeder
- Q&A



# Operational processes towards excellence

- NARO's research agenda is guided by 10-year strategic plan aligned to sector plan and national development plan (NDP III)
- Moving from only technologies for increased production and productivity to market-oriented research for agro-industrialization
- 5-year mid-term operational plan from which annual plans are derived
- Robust performance management (PM) structure and process for annual staff appraisal
- PM translates high level research strategy into manageable, SMART objectives, processes and deliverables for institutes, departments, teams and individuals



# Change management in NARO breeding

- Breeding programs have been able to relate high level principles of strategy and vision to their product profiles and breeding philosophies
- Primary goal is to modernize breeding programs for crop commodities –maize, rice, sorghum, millet, cassava, sweet potato, banana beans and groundnut
- Upgrade of breeding operations with integration of molecular and mechanization technologies for operational excellence
- Organizational team work to override commodity teams/ individual success with market-oriented mindset

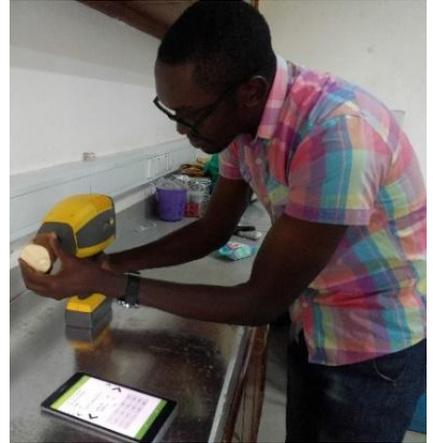
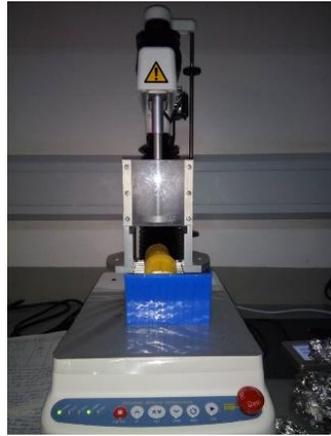
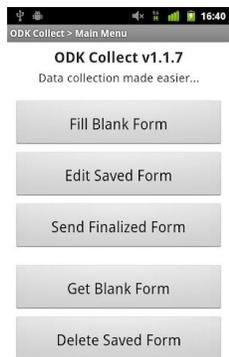
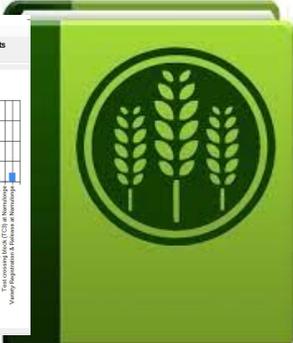
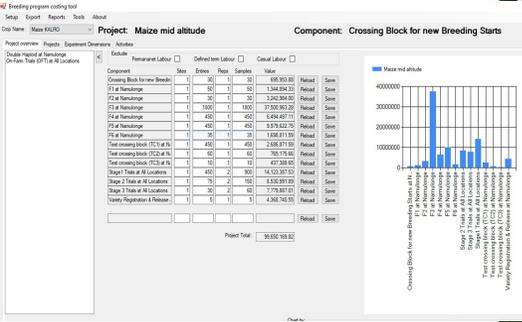
# What was implemented to modernize breeding in the last 3 years

- Market-facing breeding- stimulation of cottage and large-scale industries with new traits and products (brewery, starch, food and feed industries)
- Implementing recommendations from reviewed product profiles and BPAT breeding assessment
- Shortened breeding cycles by integration of genomic selection, anther culture, doubled haploid, LED-induced flowering





# What was implemented to modernize breeding in the last 3 years



Tools to enhance data collection from experimental fields and/or end-user surveys. Costing tools enhanced decision-making.

Instrumentation to enhance data collection, while reducing drudgery

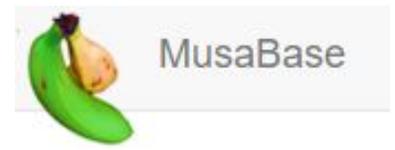
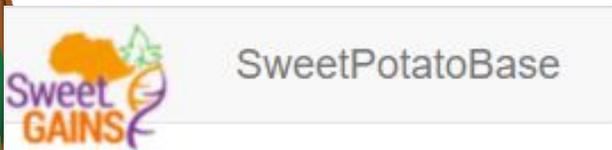
## Data ecosystems adopted

<https://sweetpotatobase.org>

<https://www.cassavabase.org/>

<https://musabase.org/>

<https://bmspro.io/>







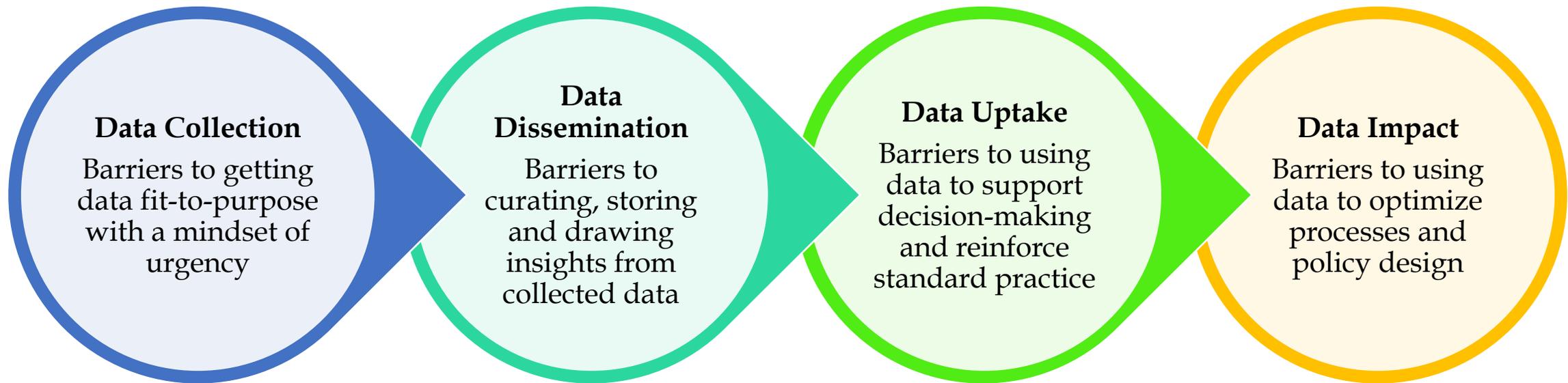
# Barriers to breeding modernization

- Barriers to change have been organizational, policies and technical

## **Organizational and policy barriers:**

- Commodity-based research structure weakens inter-program and institute collaboration, cross-functionality for effectiveness
- Limited capacity - IT connectivity, mechanization, irrigation, bioinformatics
- Inadequate and delayed budgets
- Human resource base- staff attrition, slow recruitment and absorption of well trained and experienced personnel
- Bureaucratic and lengthy procurement processes

# Breeding Barriers: best displayed by reviewing data value chain





# Overcoming barriers to breeding modernization

- Talent spotting, succession planning, recruitment and deployment – provision for NARO core and project staff
- Monthly coordination and reflection meetings across breeding programs
- Joint resource mobilization strategy- Grants office, proposal committees
- Leveraging on collaboration, shared facilities and services –strategic partnerships
- Enabled champions mobilizing and driving changes



Professionalizing variety  
license



## **Overcoming barriers: Enabling national and institutional policies**

- NARO strategic plan 2017/18-2027/28
- National IP Policy (2019) and NARO IP Policy (2017)
- NARO technologies, assets and services commercialization policy
- Framework for access to and licensing of NARO plant varieties
- Research data management policy, 2021
- PVP law (2014) and regulations (2021)
- Establishment of NARO Holdings Ltd to overcome some institutional bottlenecks



# Experiences and lessons learned in breeding modernization

- Demand-driven research and priority setting increases uptake and adoption of research products
- Investment in key research infrastructure – labs, irrigation, seed storage
- Collaborative grant writing
- Need to conduct impact assessments and document evidence of change
- A central data management is essential to monitor metrics.
- Cross-disciplinary and cross-functional collaborations and network across commodities is important and impactful
- Shared services and facilitates reduce costs and increase efficiency



# A day in the life of a NARES breeder

- Resource mobilizer, implementer, manager, communicator and reporter
- Limited hand-offs due to limited human resource
- All over the place and jack of all trades- Limited specialization in breeding pipelines and disciplines (genetic resource management, line development, product development, testing, analytics, seed systems and dissemination)
- In some cases, a breeder for multiple commodities
- Closer to customers and industry-opportunity for impact
- Social and family person