



**Resilient varieties developed to mitigate
the risk of climate change and how to
make them available to producers**

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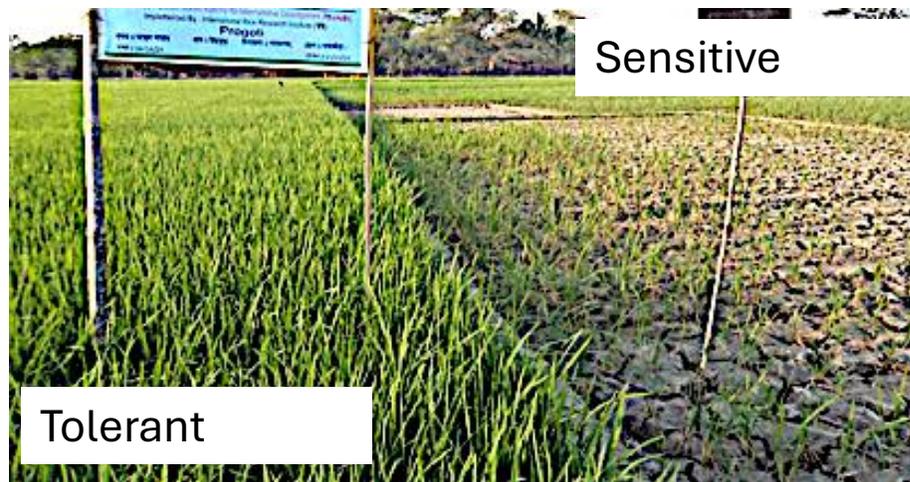
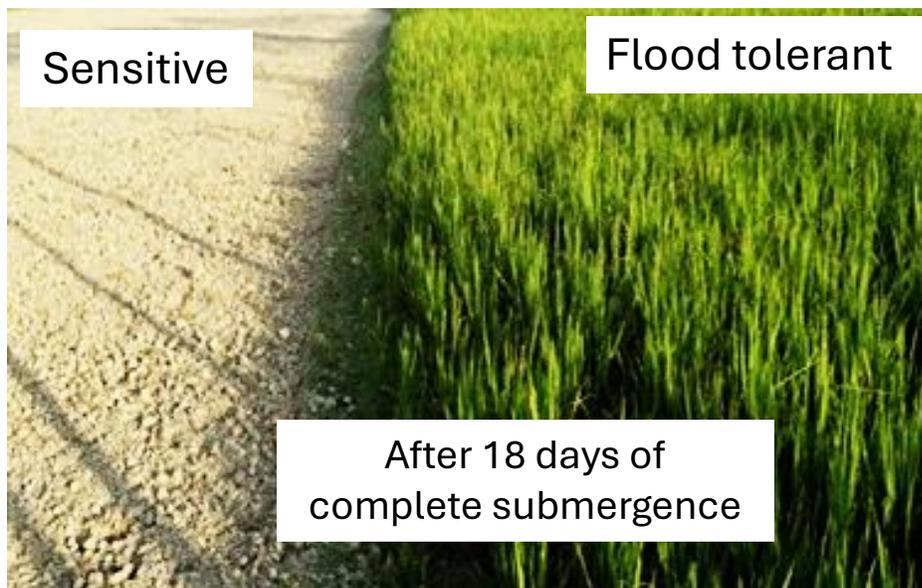


Research Priorities

- Modern varieties: deploy high yielding, nutritious and climate resilient varieties via effective seed system models
- Efficiency: reduce production cost and postharvest losses, improve production, competitiveness and income
- Capacity building – human and infrastructure
- Catalyze policy reforms for effective value chains, competitive products, and cross border exchange to speed progress and impacts –
- Reducing negative consequences on human & environmental health:
 - Non-communicable diseases – malnutrition and mycotoxins
 - Water-borne vectors and parasites – e.g. malaria vectors
 - Emission of greenhouse gases



Good progress in developing varieties adapted to a particular stress

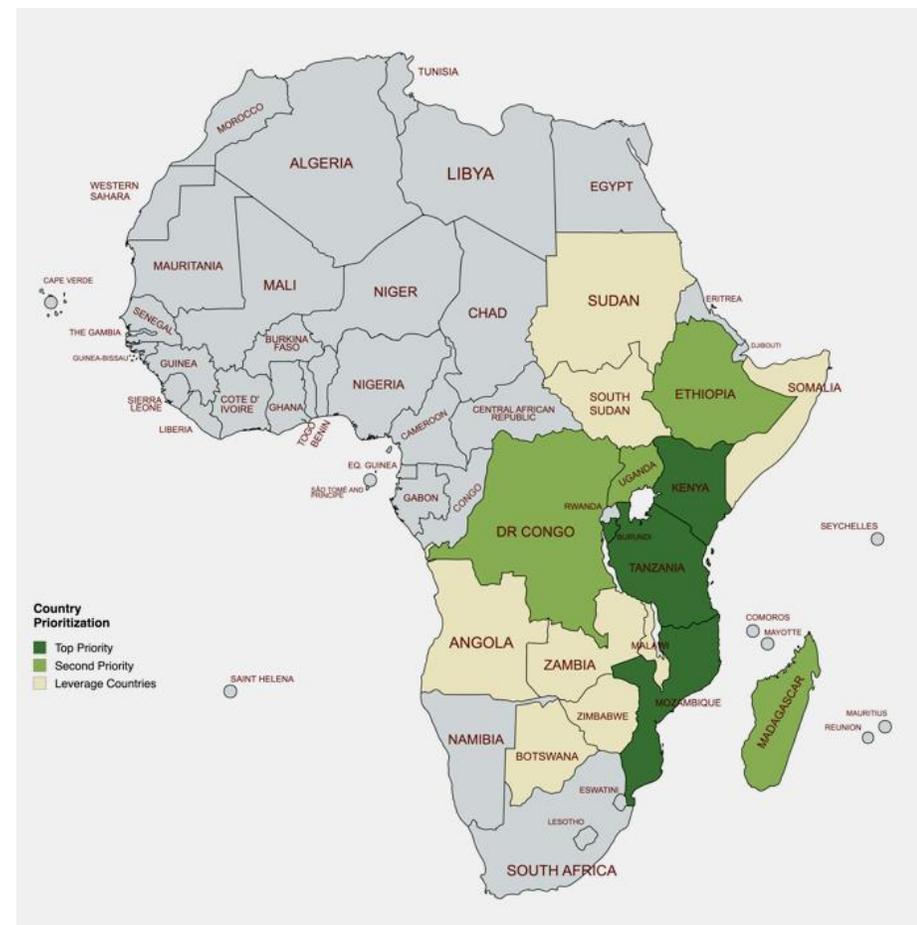


Early-season salt stress

Late-season salt stress

Varieties released in ESA since 2011

	Country	No. of Varieties
1	Burundi	19
2	Tanzania	04
3	Kenya	06
4	Mozambique	07
5	Malawi	05
6	DRC	07
7	Uganda	03
8	Somalia	03
9	Zambia	03
10	Sudan	02
	Total	59



Anaerobic Germination

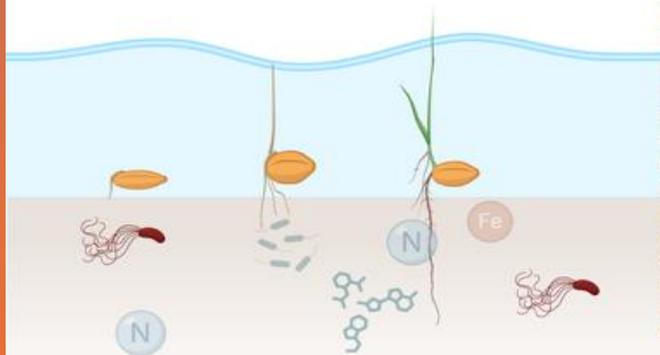
Underwater (1-7 days)

Water level 5-10cm

Anaerobic Germination,
Fermentation and α -amylase

Coleoptile Growth

Lack of O_2 delay in germination and effects on metabolic pathways



Flash Flooding

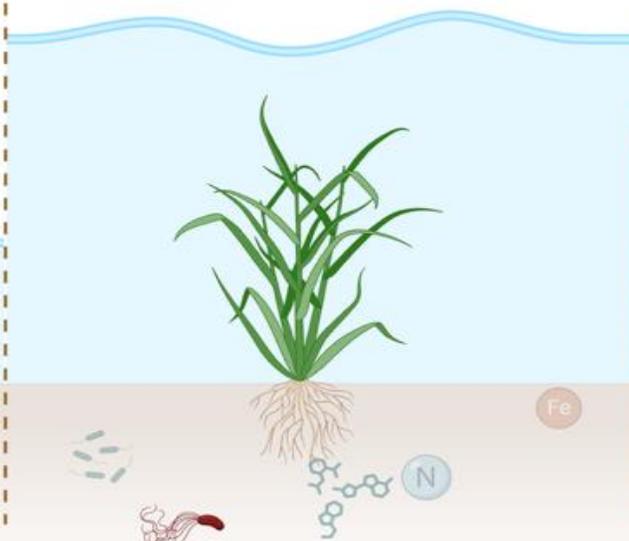
Underwater (7-14 days)

Water level 20-100cm

GA Repression and Energy
Conservation

Quiescence Strategy

Complete inundation *SUB1*
gene



Stagnant Flooding

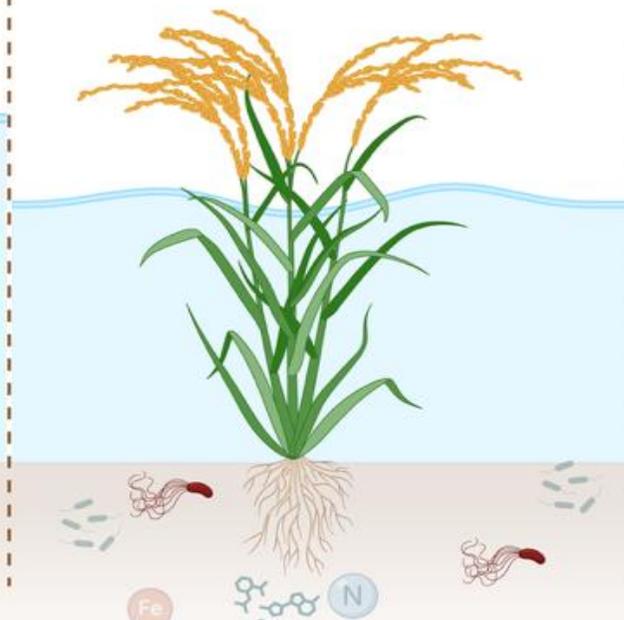
Partially underwater (Weeks to Months)

Water level 20-65cm

Ethylene and Hormonal
Cross Talk

Goldilocks Elongation

Moderate internode
elongation.



Deep Water Flooding

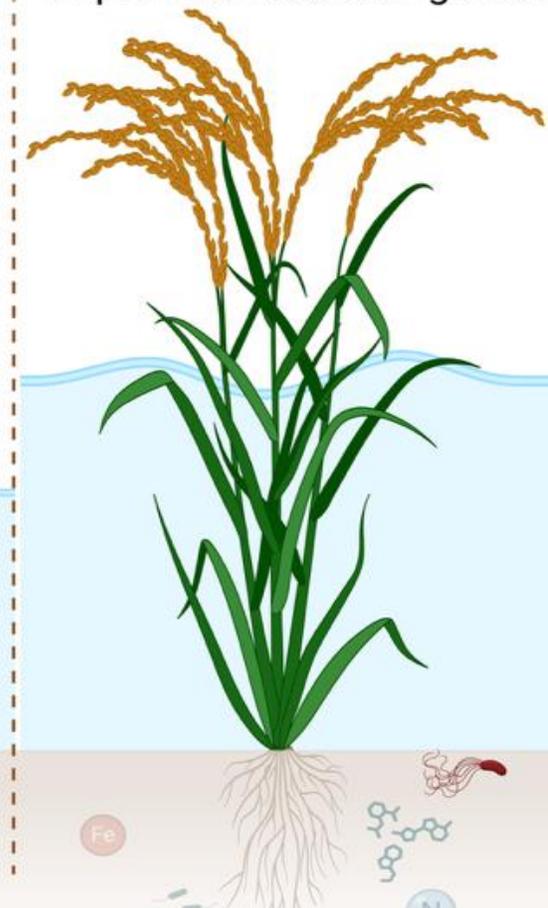
Partial submergence (Months)

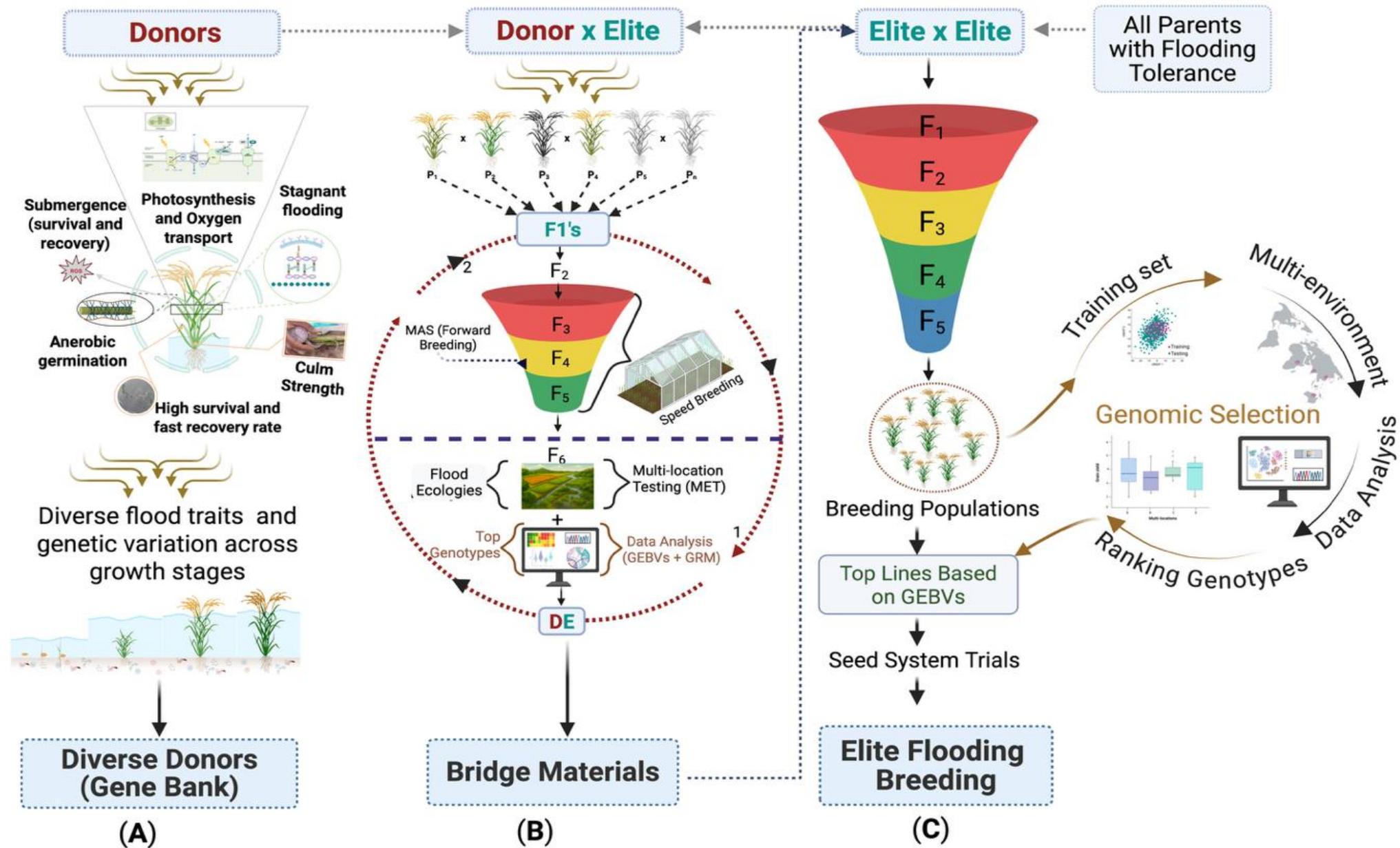
Water level 50-100cm

Ethylene, Gibberellin and Stem
Elongation

Escape Mechanism

Rapid internode elongation





Conected Breeding

Transition from Trait to Environment

Multiple traits for climate resilient varieties



Deploying new genes to Komboka*

Project	Target genes	Current generation	Selection	Comments
QD102	<i>rymv1-5, Pi9+Pi35+Pikh</i>	BC2F1	May 2025	
QD103	<i>rymv1-2+rymv2+RYMV3</i>	BC1F1	Feb 2025	Recovery >65%
QD105	<i>qSIS1.2, qSIS1.1, qSIS11.1, qDTY2.2</i>	BC1F1	Feb 2025	
QD106	<i>rymv1-5+rymv2+RYMV3</i>	BC2F1	Feb 2025	Recovery >85%

* Listed in the COMESA Seed Variety Catalogue

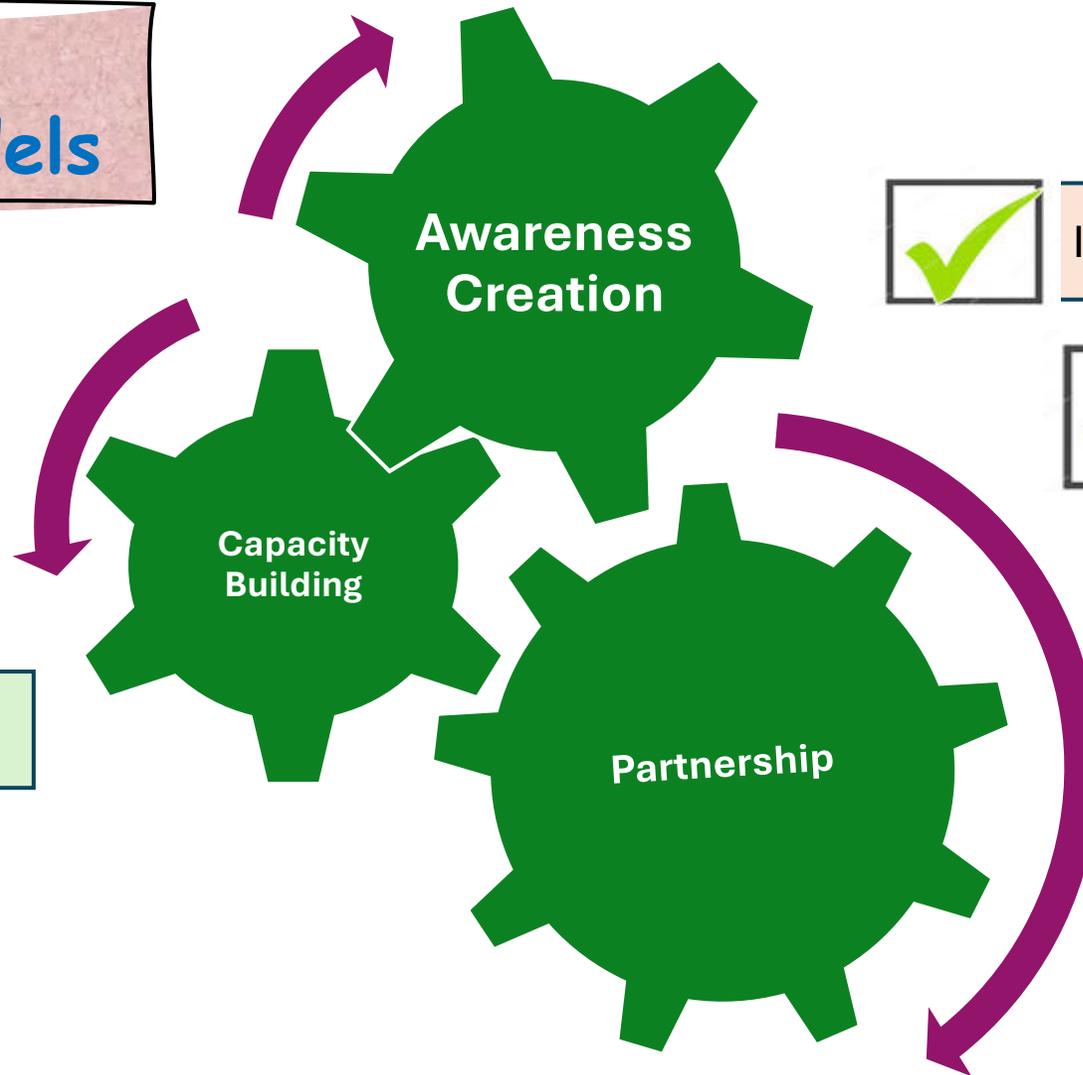
Strategies for seed production & delivery

Inclusive business models

✓ Accessibility

✓ Affordability

✓ Sustainability



✓ Informed Choice

✓ Efficient Delivery

✓ Enabling Policy

✓ Proper Planning

✓ Market Linkages

Cross-cutting: Gender and youth inclusion

Seed Production and processing facilities

Seed Production training



Seed drying



Flat bed dryer



Husk furnace

Seed dressing



Seed dresser

Seed Storage



Hermetic bags

Capacity strengthening of NARES and Farmers' Cooperatives in seed production

Augmenting NARES and Farmers' CoOp's Capacity in seed production

KALRO- Kibos (2023)



MRGM (2023)



Processing method	Labor required	Seed processed
Manual (Karol Kibos)	9	180 kg
Manual (MRGM)	9	1 ton
Seed dressers	1	40 tons

Tanzania “SEED BRIDGE”

Objective: To create a functional, multi-stakeholder, inclusive platform to scale new rice varieties.



Core Functions:

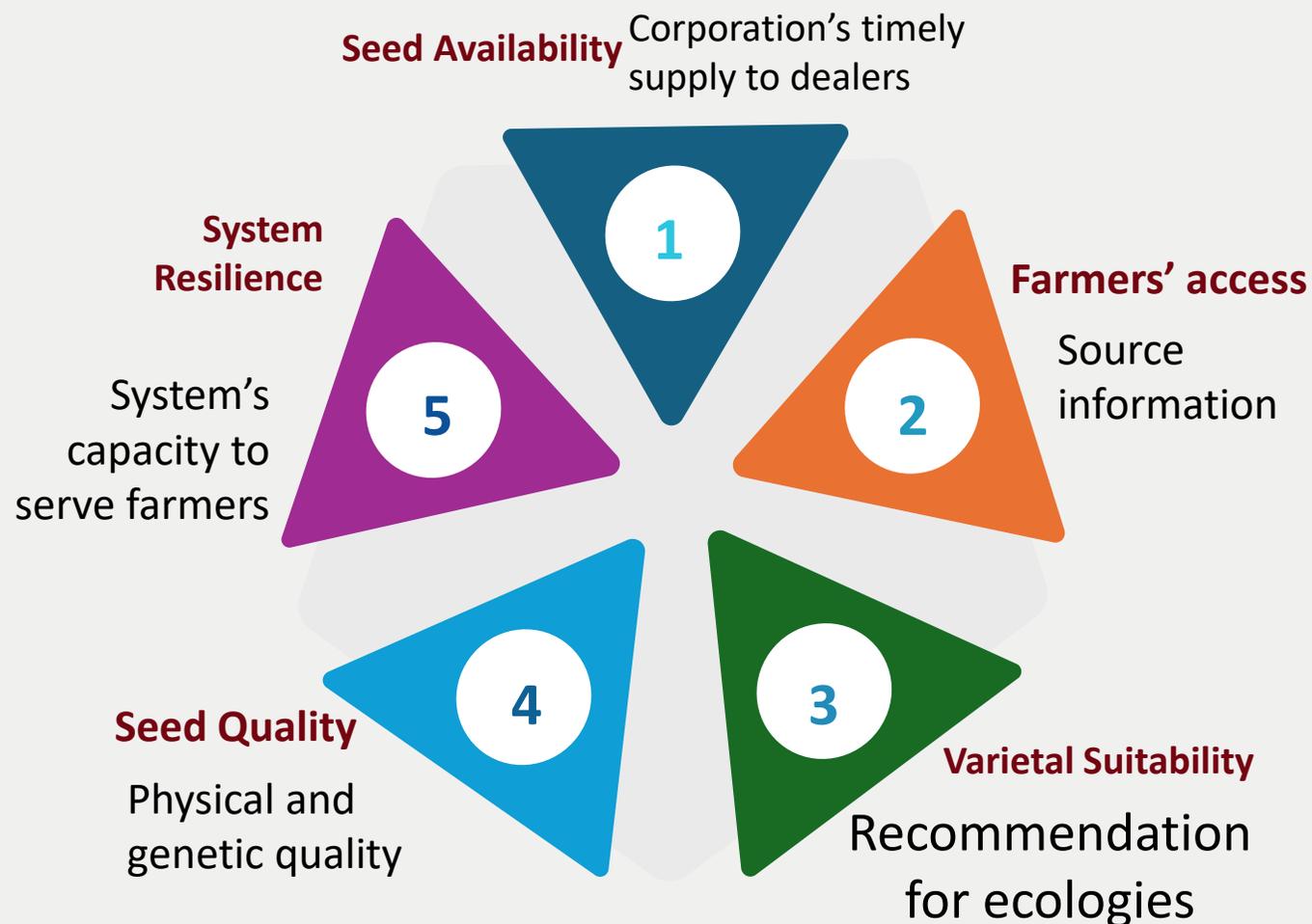
1. Facilitate variety data sharing and performance review.
2. Support licensing and access to germplasm.
3. Link seed producers with markets and policy actors.
4. Capacity Building of the seed actors
5. Monitor adoption and quality assurance.

Integrating digital tools to strengthen the seed value chain

SeedCast-TZ - an enabler to "SEED BRIDGE?"

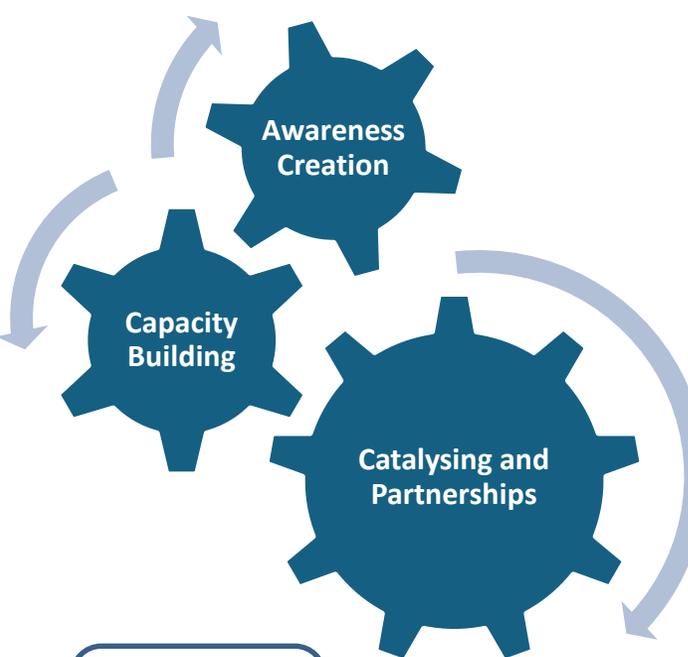


SeedCast: system enabling tool for production, supply and timely distribution of seeds (hosted by TOSCI)



Komboka success in Kenya

(KALRO, IRRI, MRGM, NIA, private companies, NGO,...)



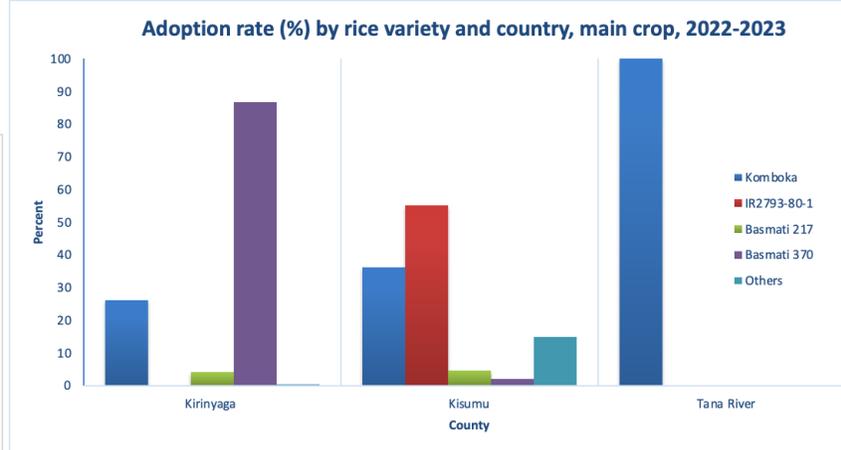
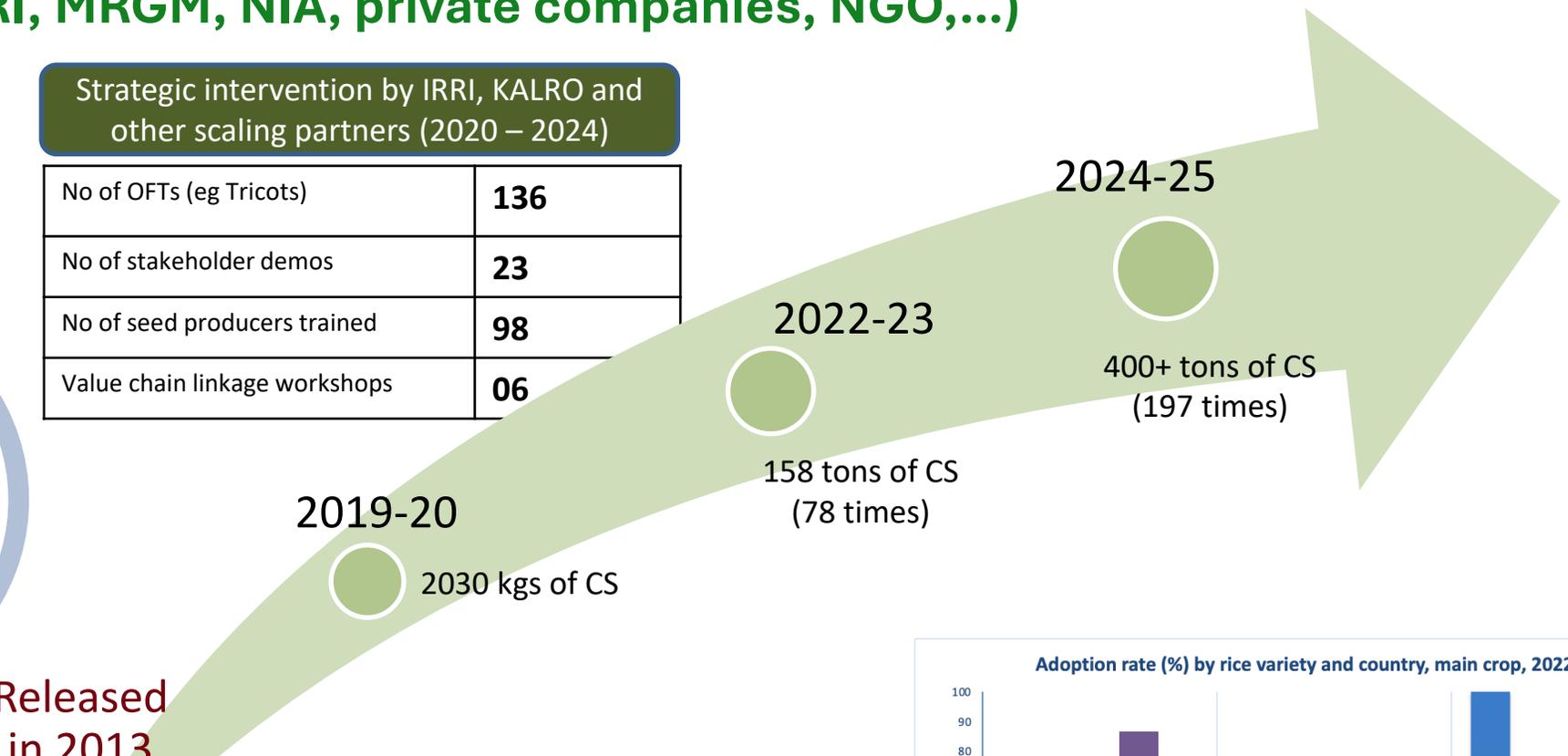
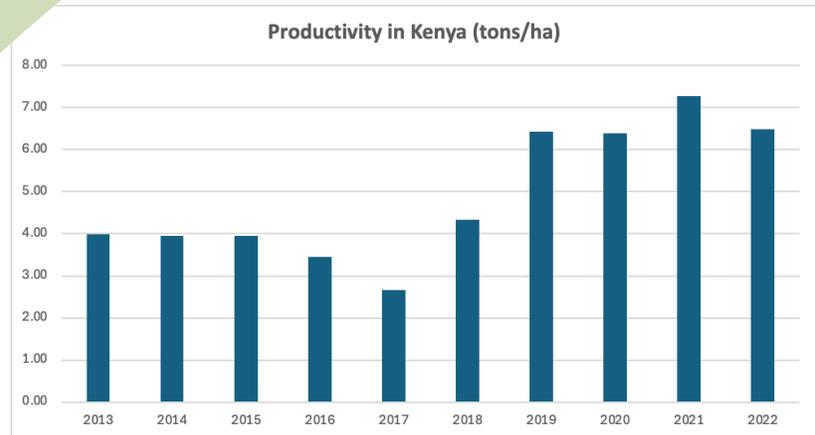
Strategic intervention by IRRI, KALRO and other scaling partners (2020 – 2024)

No of OFTs (eg Tricots)	136
No of stakeholder demos	23
No of seed producers trained	98
Value chain linkage workshops	06

Strategy Deployed by IRRI

Released in 2013

Higher productivity (6+ t/ha) over last 4-5 yrs (FAO)



A study shows 100% area under Komboka in Tana region (a new area under rice cultivation in Kenya)

Africa is most vulnerable and first and most affected by CC and global crises

Catalyzing changes for impact and resilience

- Cutting-edge technologies for faster product development and delivery
- National & regional commitments to climate resilience, food security and market access
- Supporting and de-risking smallholder farmers
- Engaging private sector
- Better forecasting and monitoring (Apps, modeling, AI, ML, etc.)



Thank you

