

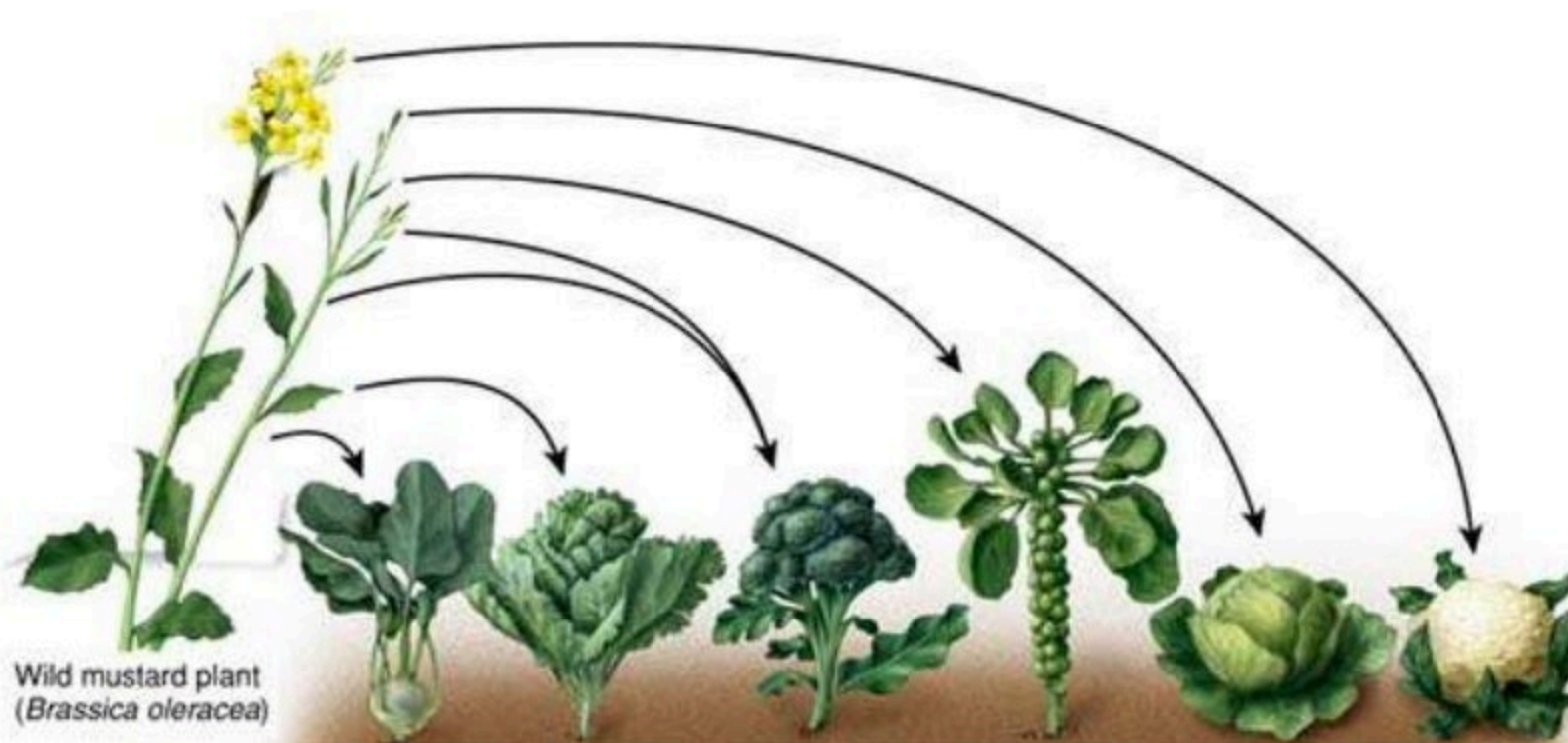
Gender-responsive Breeding and Product Profiles

Developing gender-responsive plant and animal breeding programs: Principles, methods and tools

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April 1st 2019**

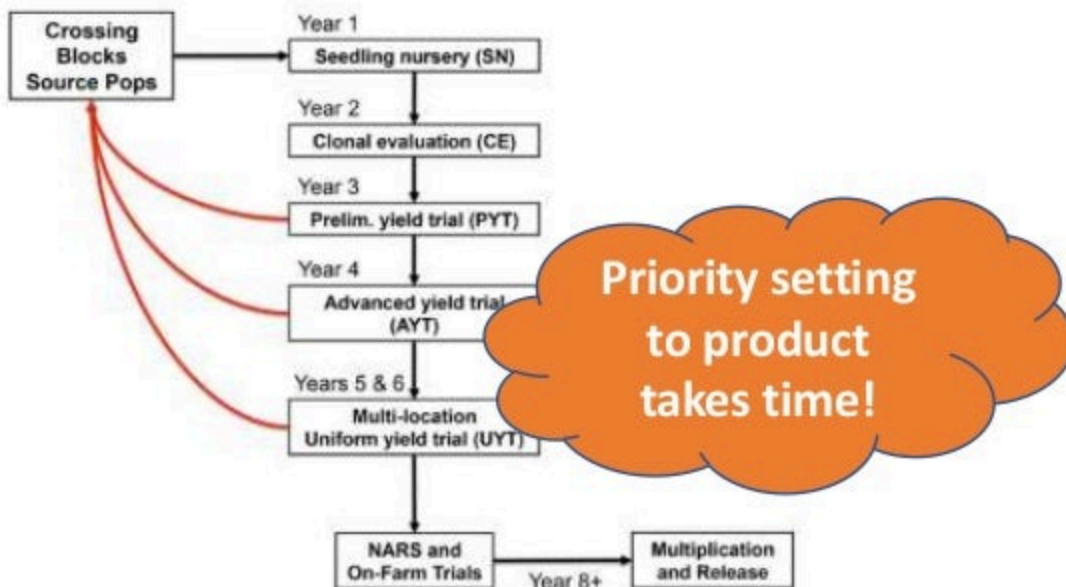


Plant Breeding is the genetic improvement of plants for human benefit.
 (Bernardo, 2010)



Strain	Kohlrabi	Kale	Broccoli	Brussels sprouts	Cabbage	Cauliflower
Modified trait	Stem	Leaves	Flower buds and stem	Lateral leaf buds	Terminal leaf bud	Flower buds

<http://plantbreeding.ukzn.ac.za/Homepage.aspx>



Each selection is a decision point

Table 4: OVERALL CASSAVA TRAIT FREQUENCIES. Frequencies with which cassava traits are mentioned by cassava farmers in the study sites in the Southwest and Southeast of Nigeria. Traits are listed according to the frequency (from high to low) with which they were mentioned across regions. Data are then dis-aggregated by sex. For the disaggregation into regions only the traits that show significant differences between men and women are shown. Differences in frequencies between the sexes are tested for using Chi-square test.

Traits	Frequencies (%)			
	All respondents	Women	Men	P-value
Overall				
High yield	73.3	72.2	74.4	ns
Root size	60.0	68.1	52.6	0.053
Early maturing	55.3	54.2	56.4	ns
Dry matter content/swells	42.7	43.1	42.3	ns
Cooking / processing quality +	40.0	48.6	32.1	0.039*
Flesh color	38.0	31.9	43.6	ns
Post harvest shelf life	38.0	38.9	37.2	ns
Poundability	37.3	34.7	39.7	ns
Fast cooking	32.0	29.2	34.6	ns
Good price/marketability	29.3	26.4	32.1	ns
Agronomic characteristics++	26.0	18.1	33.3	0.033*
Taste	24.7	30.6	19.2	ns
Resistance to pest and diseases	20.7	18.1	23.1	ns
Adaptation to extreme weather condition	10.0	9.7	10.3	ns
Labor requirement	4.7	5.6	3.8	ns

Act on measurable traits and evidence

What does gender have to do with it?

New varieties are the main output of breeding programs

“Varieties are gender neutral”

“The benefits from new varieties are for everyone”

“Farm households function as a unit - work and benefits are shared”

“We cannot breed varieties only for women!”



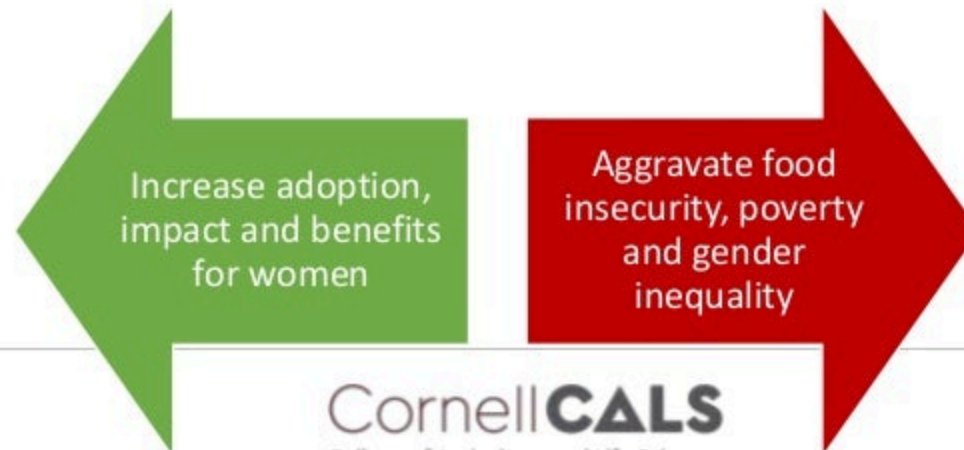
<https://answercrowd.com/guides/7-key-steps-market-research-process/>

Breeding is **inherently market driven**.
Varieties must:

- Meet the needs of end users
- Benefit smallholder farmers

Priority setting: For where and for whom?

- Most breeding programs define breeding objectives through expert input (Ragot et al., 2018)
- Geography vs demography? “Target environment” = natural + socio-economic (Christinck and Weltzien, 2009), Bettina Haussman’
- Wide array of traits from diversity of uses and users is a challenge for breeding programs (Christnick et al. 2017)
- Prioritize reduced number of “common denominator” traits designed to impact the largest possible number of people

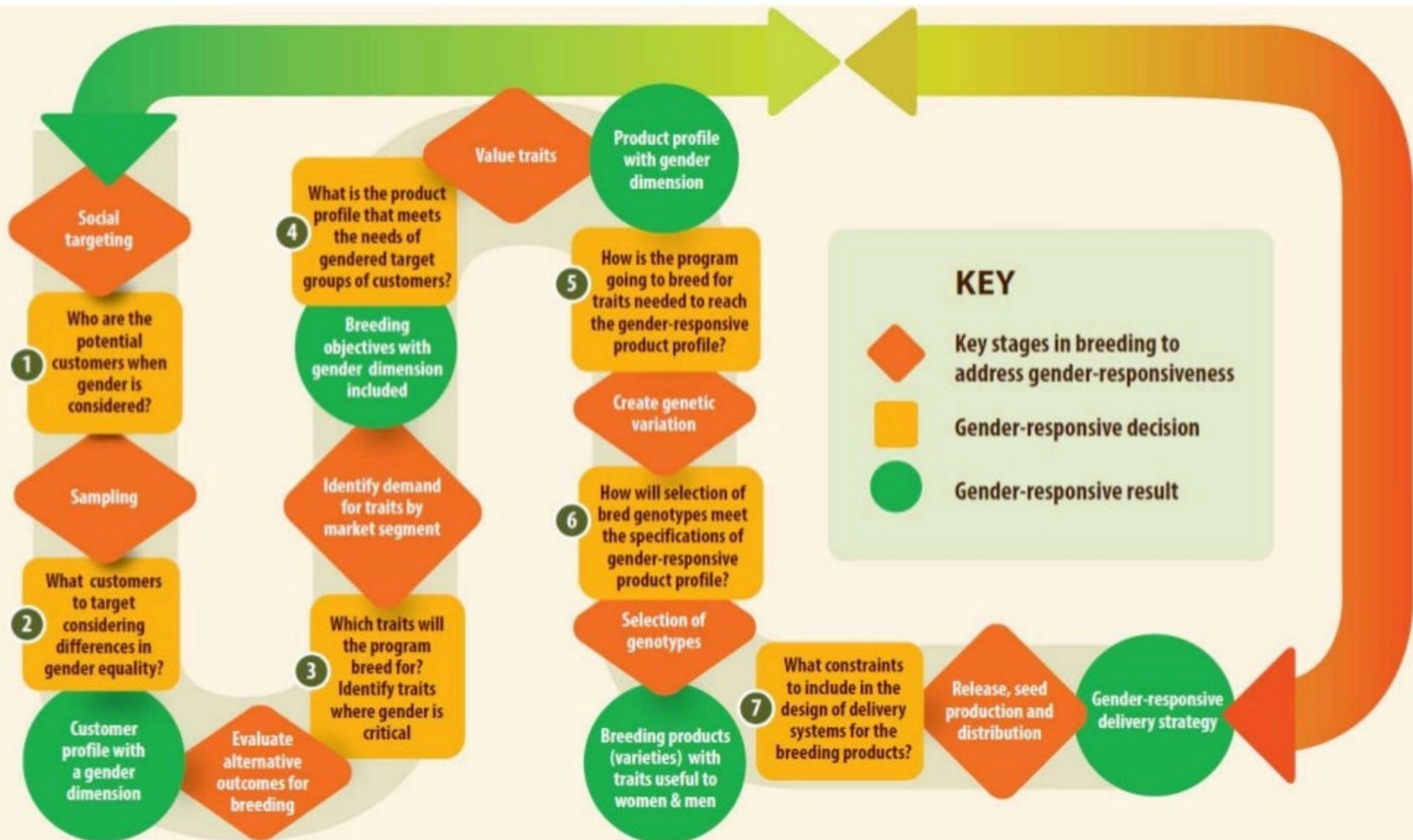


Gender intentional priority setting

- Traits follow gender divisions of labor and market access (Christnick et al. 2017).
- “Who controls the gene flow, and who determines which genetic qualities are valued, in which markets, for which purpose?” (Farnworth and Jiggins, 2003)
- Careful diagnosis through gender analysis- diversity of users, their needs, goals and livelihood strategies

Genetic gains = Equity gains

GBI Decision Checklist



Setting Priorities: Sorghum in Mali

Agro-ecological conditions

Socioeconomic

Culture and knowledge

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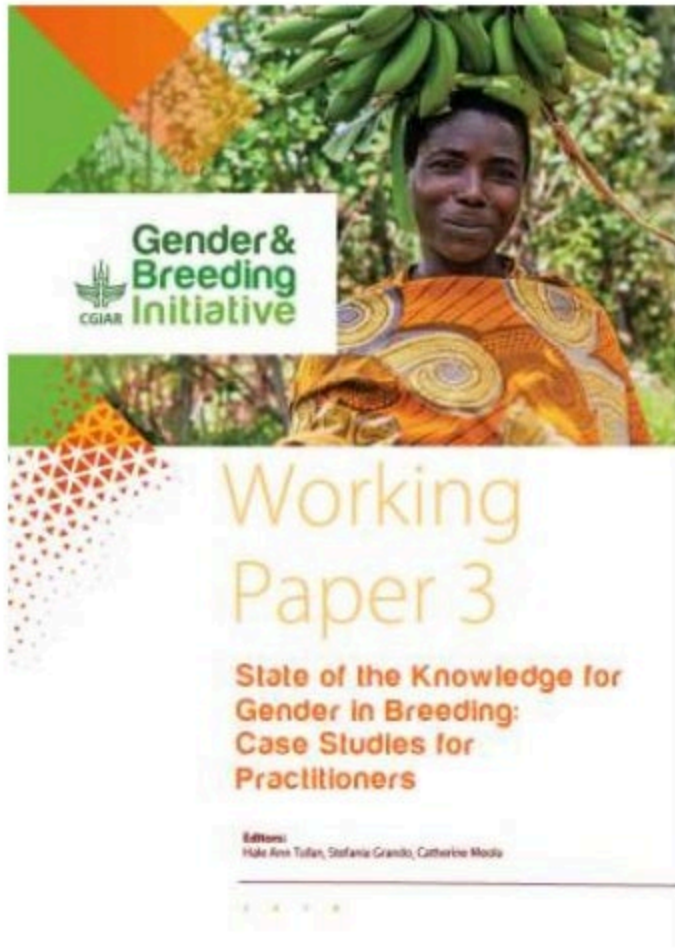
Changes in the breeding program

- Develop methodology for evaluation of processing qualities, and culinary preferences
- Adapt protocol for on farm trials to meet women's field conditions
- Develop breeding scheme based on selecting under low fertility conditions
- Initiated selections in Kende sorghum accessions important to women



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Gender responsive programming...



- ...improved women's capacity to deliberate about **choices of action**, experiment with options, create **new practices** and **enlarge their network** of horizontal relationships with other actors (Song et al, 2018).
- ...[led to] **stronger inclusion of women's preferred varieties** for seed production by village cooperatives. Women were also empowered to **diversify their economic activities**, including large-scale commercialization of seed (Rattunde et al, 2018)
- ...[led to] positive changes in the empowerment of women were visible in terms of the **recognition of women as farmers** by the women themselves, their families and communities (Galie et al, 2013)



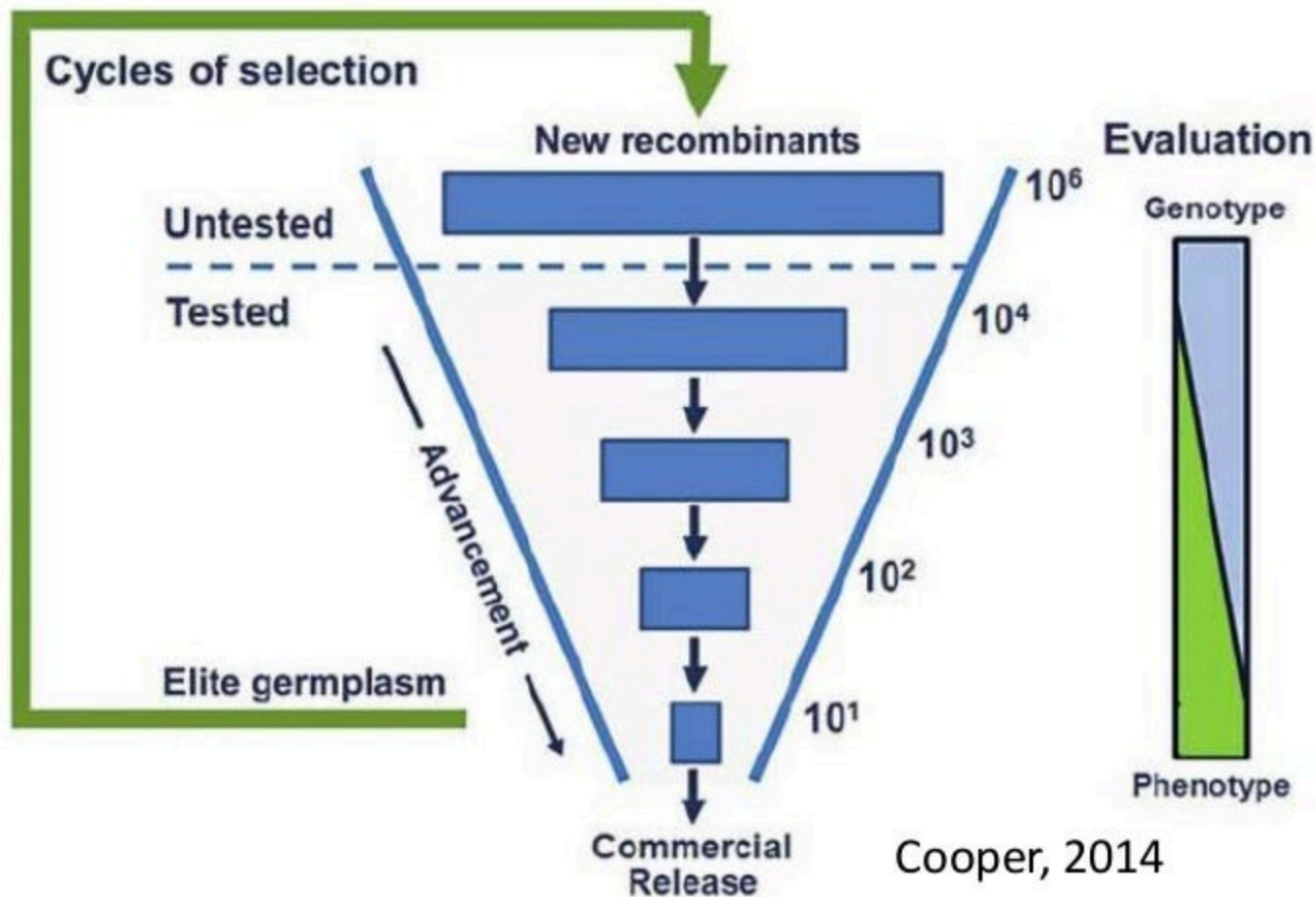
Gender & Breeding Initiative

What can a breeding program do to be gender responsive?

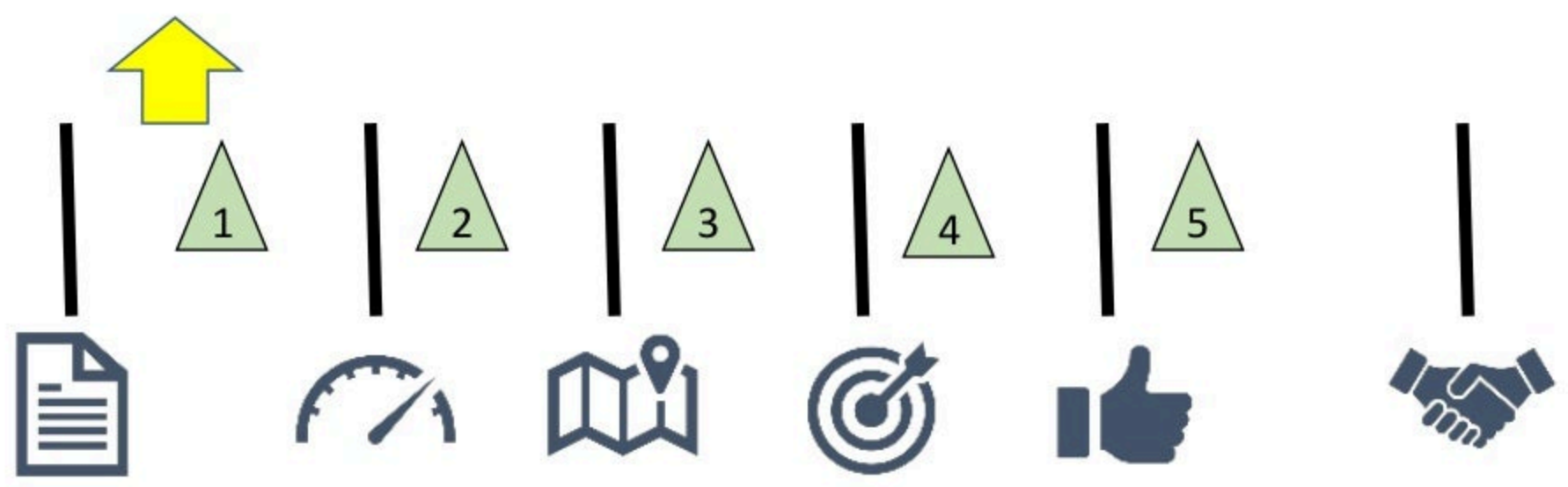
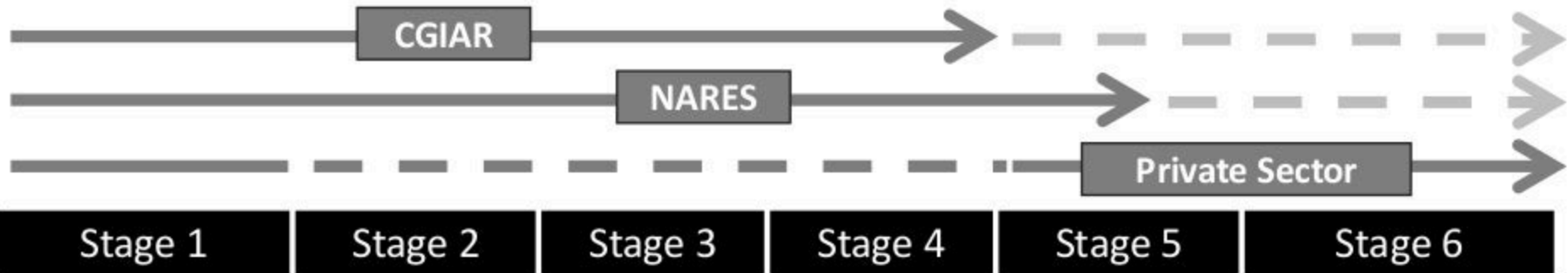
- 1) Know when, where, and why women are an important beneficiary group. Take into account important differences in constraints faced by women and men farmers that breeding can influence.
- 2) Anticipate how design decisions (e.g., defining plant ideotype, prioritizing of traits, targeting and testing varieties with farmers) may impact and be influenced by women's labor, available resources and opportunities.
- 3) Design breeding objectives specifically to benefit women farmers when they are an important beneficiary group who require a special approach, and consider their needs, constraints and knowledge more generally in the breeding program.
- 4) Be accountable, making sure the success of the breeding program is measured in ways that include positive impacts for women, as well as for households or farmers in general.



Breeding 2.0



“Accelerated breeding cycles help you get where you want to go faster...”



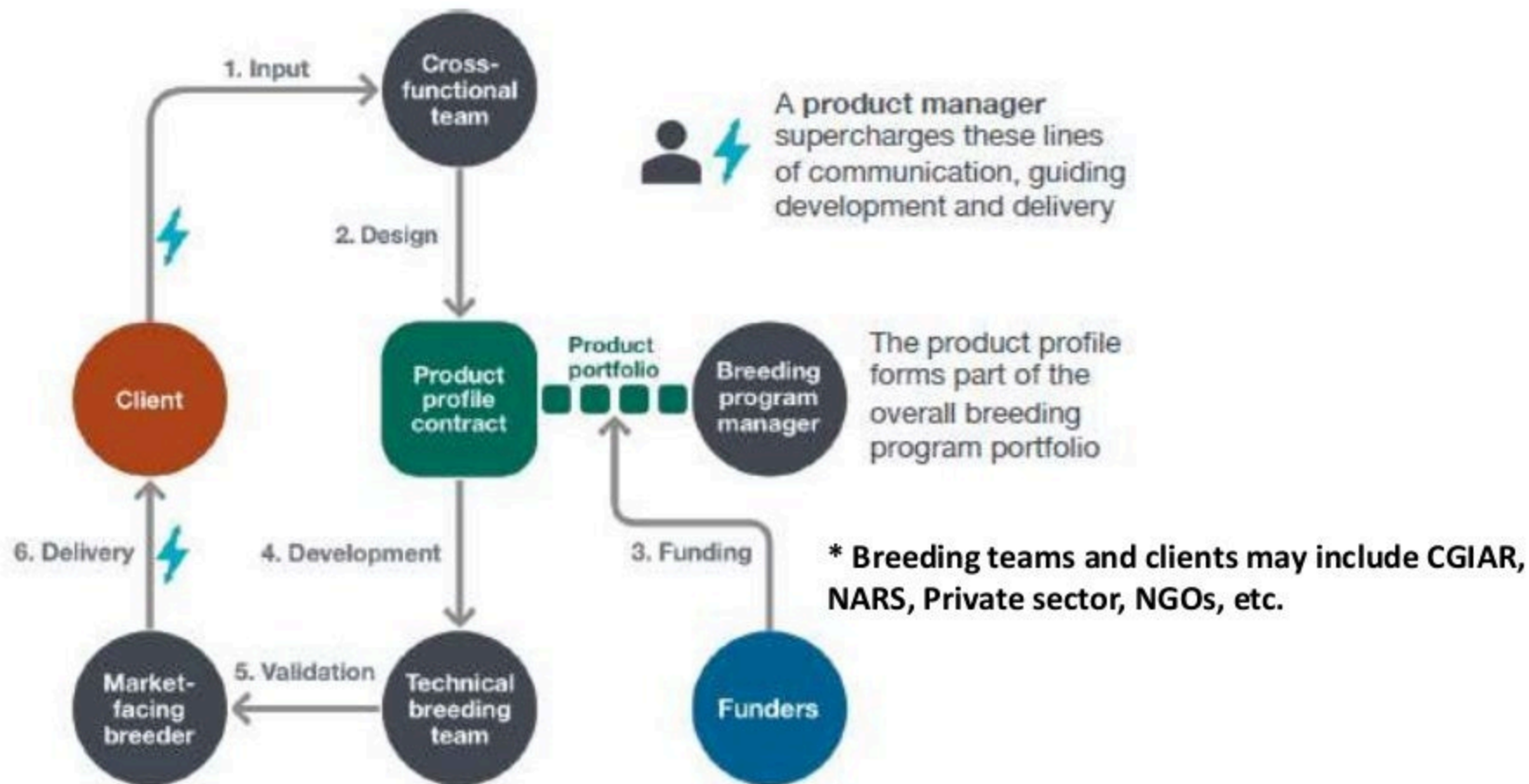
Product profile

- A Product Profile is a set of technical attributes which a new variety is expected to meet to be successfully released onto a market segment.
- Good product profiles set a **target benchmark for the required performance of each trait:**
 - comparing the performance with existing varieties
 - or expressed on a numeric or photographic scale
- A product profile is required for each new prospective variety.
- A product profile can be easily communicated to other breeders, scientists, managers and non-scientific stakeholders

Eva Weltzien GREAT course 2018

The product profile process

The product profile functions as a contract between all stakeholders in a network to design and deliver market-focused products



Product profile contract

Product to be replaced

Name of commercial product to be replaced

TMS-IBA011368

Agro-ecology zone Humid tropics and derived savannah

Mark the five highest priority geographic centers for this product profile contract.

7.401777743905011	3.8140882282966686,
6.726822363875752	3.507157686304481,
6.585985905556969	5.562287691187294,
6.3577668378983985	6.793443086695106,
5.014153429420711	7.035828950952919

Basic traits

Basic trait 1 Provitamin A

Basic trait 2 CMD tolerance

Basic trait 3 Gari quality

Basic trait 4 Fufu quality

Basic trait 5 good dry matter content

Contract

Value-added trait 1 Higher provitamin A

Benchmark line or variety TMS IBA070393

Your trait compare to the benchmark Equal to or greater than the benchmark by 15

- An opportunity to formalize breeding commitments- entry point for gender research?
- Participatory research intentionally engaging gender and social difference can help set targets
- Yearly review of targets opens door to input new evidence and information for course correction

Sorghum variety traits demanded	Agreed levels	Trait Priority	Selection Objective	Short-term Priority for Genetic Change	Long-term Priority for Genetic Change
High Grain Yield	15% > local also @ LP	must have	Maximise	4	1
Early Flowering	< 1 week, pps	must have	Threshold	2	6
Tall Plant Height	> 2.5m	important	Threshold	6	7
Resistance to Striga	> check	nice to have	Opportunistic	9	8
White Grain Color	> local	must have	Threshold	3	4
Leaves green after grain maturity	> local	nice to have	Opportunistic	10	10
Good threshability	= local	must have	Threshold	5	9
Good Flour Yield	= Local	must have	Maximise	1	2
Stover digestibility	2% > local	important	Opportunistic	7	3

Call for case studies!



- Cases showing evidence of impact from gender responsive breeding
- All crops, animals, fish welcome!
- Call will come out in May 2019 to be published early 2020



Thank you!



NEXTGEN
CASSAVA



GREAT

GENDER-RESPONSIVE
RESEARCHERS
EQUIPPED FOR
AGRICULTURAL
TRANSFORMATION

Case Study call