Workshop Report

Innovation in Gender-Responsive Breeding

Nairobi, Kenya | October 5-7, 2017
Participants at the Innovation in Gender-Responsive Breeding Workshop

Photo: H. Holmes/RTB

CGIAR Gender and Breeding Initiative Workshop Report

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EXECUTIVE SUMMARY

A three-day Innovation in Gender-Responsive Breeding workshop was held in Nairobi, Kenya, as a follow-on to an initial gender in breeding workshop held in October 2016, and organized by the CGIAR Gender and Agricultural Research Network. That workshop sought to stimulate active cross-fertilization of ideas from different breeding, genomics and social science perspectives and experiences and to produce some clearly expressed “must-have” features of gender-responsive plant or animal breeding program.

The 2017 Innovation Workshop reported here was organized by the CGIAR Gender in Breeding Initiative (GBI) and used the 2016 “must-haves” as a starting point for developing more refined “design principles” that can be used to integrate the explicit consideration of gender issues into breeding program decision-making. The goal: to help catalyze a deliberate shift towards gender-responsive breeding in the CGIAR.

In addition to producing more refined design principles for integrating gender into decision-making about breeding, the workshop captured the views of its participants regarding the basis for those principles, as well as their thoughts about three important “input papers” that were presented in draft form during the meeting – Gender and Social Targeting in Plant Breeding; Setting Breeding Objectives and Priorities; and Case Studies of Gender-Responsive Breeding Programs. They also made significant contributions to the development of potential “uptake pathways” for expediting a shift in the CGIAR towards mainstreaming gender considerations in breeding programs, as well as to the development of a fundraising strategy aimed at sustaining the momentum of gender in breeding efforts across the CG System.

Participants also learned about the important progress being made by the Gender and Breeding Post-Doctoral Fellow Initiative that was launched in 2016. The seven PDFs currently working in the Initiative (five in Africa and two in Southeast Asia) are jointly exploring common and unique aspects of breeding research in the CGIAR, and developing innovative methods and tools for integrating gender into decision-making. The idea behind the PDF Initiative is to strengthen current and future interdisciplinary work and influence the emerging conceptual framework for enhancing gender and social targeting in breeding research.
Key workshop outputs

The Innovation Workshop produced several important outputs, described in some detail throughout this report.

**Design principles** – Central among the outputs from the meeting was the clarification and refinement of a set of essential design principles that, if used in designing a breeding program, will ensure the integration of critically important gender considerations in decision-making. The participants did more than create a better list of must-haves, however; they identified where in the breeding cycle that gender-related questions must be asked and answered, as well as the kind of information needed to adequately do so. It is clear that gender-relevant decision criteria must be applied early in the breeding cycle, when making decisions about targeting, sampling and breeding objectives, as well as throughout the rest of the steps in the product development cycle.

A brief is being prepared describing the key gender-responsive decision points or stage-gates around the breeding cycle, which will link with the more detailed explanations of social targeting, market segments, customer profiles and product profiles described in the input papers. This brief will provide a foundation for setting breeding objectives and for implementing the successive stages of the breeding cycle in a gender-responsive manner.

**Uptake pathway for promoting gender-responsive breeding** – One of the workshop’s small groups focused on developing an uptake pathway aimed at facilitating the adoption of gender-responsive breeding approaches. It started by delineating the theory of change, and then identified the essential and secondary outputs that should be produced by GBI to catalyze uptake. Essential outputs include a compelling evidence base in support of gender-responsive breeding, the design principles, and an effective advocacy strategy. Secondary outputs include a roadmap for collaborating with other platforms in the System, establishing and curating a vibrant community of practice engaged in advocacy and supporting gender in breeding, a library of case studies, and producing a gender-responsive breeding toolkit. The group went on to define the expected outcomes of the Initiative’s efforts, both at the “next user” and “end user” levels.

**Fundraising strategy** – Another small group focused on developing a fundraising strategy that is closely linked to the uptake pathway work. The strategy identifies a set of project “work packages” or activities, which align closely with activities described in the uptake pathway. Two options for designing the fundraising effort were developed, as was a possible funding envelop (target) and a list of potential donors, many with a history of interest in gender issues.
Recommendations for institutional change – A fourth small group gave their attention to identifying the institutional changes that are needed to embed the design principles into gender-responsive breeding programs. In particular, the group noted that social scientists must be enabled to access and process relevant data, and that management needs to facilitate joint programming and decision-making by breeders, social scientists, economists and others at key points of the breeding cycle.

The group asked: What needs to change in institutions to create an enabling environment for gender-responsive breeding? They defined “Institutional change” to mean change in the formal and informal rules that guide activities at four levels: breeding programs; institutes; the CG System; and the informal attitudes of all involved. In outlining the recommended changes, the group identified those that should be considered “must haves” at each of the four levels, and in some instances, they suggested how to go about achieving the needed changes.

The World Café – On Day 2 of the workshop, participants engaged in an interactive sharing and discussion of approaches and tools relevant to gender-responsive breeding. This was called “The World Café”, and essentially involved poster presentations to small groups which rotated, coupled with intensive Q&A with participants. The World Café provided an opportunity for refining the tool or approach presented and for critical thinking around how it can be applied by breeding programs and at what stage in the cycle. Ten presentations were made in two rounds, one before the lunch break and one after. The posters are included in Appendix 4, along with short summaries of comments about them from workshop participants.

For summaries of all the small group discussions, see Appendix 1. The workshop agenda is presented in Appendix 2, and the list of participants can be found in Appendix 3.
1. WORKSHOP BACKGROUND

Widespread adoption and impact of new crop varieties and animal breeds on resource-poor farms depends on the tangible benefits these research products provide for women and men farmers. For breeders to meet the needs of these users, they must understand the priorities that women and men assign to genetically determined traits. Many CGIAR breeding programs realize that if they overlook traits important to women users, this can exacerbate household food insecurity and poverty. But breeding programs still lack adequate practical methods and tools to help them be more gender responsive in their breeding efforts.

A workshop on Gender, Breeding and Genomics was held in October 2016 (in Nairobi, Kenya) with support from the CGIAR Gender Network. The workshop participants concluded that the knowledge and experience exist to construct, in a short time, a clear strategy for gender-responsive breeding, along with supporting methods, tools and practices. However, this knowledge is scattered in different sectors and disciplines and needs to be brought together through a multidisciplinary team effort. This realization led to establishing a CGIAR Gender and Breeding Initiative (GBI), which is working to:

- Increase the development impact of breeding by recommending practical ways to improve gender responsiveness with key stakeholders, including investors, research managers, breeders, social scientists, farmers and other user groups;
- Develop evidence-based methods and tools for gender-responsive targeting, implementation of breeding programs, and linkages with variety dissemination; and
- Support a Community of Practice (CoP) for gender-responsive breeding to encourage active sharing and development of methods and tools.

The GBI includes experts from across CGIAR Research Centers and Research Programs, is coordinated by the CGIAR Research Program on Roots, Tubers and Bananas and the International Potato Center, and is supported by CGIAR Funders.

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1 This Network has since transitioned into the CGIAR Collaborative Platform on Gender Research
1.1 WORKSHOP GOAL
As a follow-on to the 2016 meeting, the GBI held an “Innovation Workshop” in October 2017 (also in Nairobi) that involved many of the participants from the first consultation, augmented by a broader group of CGIAR scientists (there were a total of 41 participants in this second workshop).

The primary goal of the 2017 Innovation Workshop was to help catalyze a shift towards gender-responsive breeding in the CGIAR, a change driven by the multidisciplinary team of scientists that participated in the 2016 workshop, as well as the energy and fresh perspectives of workshop participants new to the effort.

1.2 INPUT PAPERS
GBI commissioned a set of three papers as key inputs to the workshop: 1) Gender and Social Targeting in Plant Breeding; 2) Setting Breeding Objectives and Priorities; and 3) Case Studies of Gender-Responsive Breeding Programs. Working drafts of the first two, and progress achieved on the third, were presented to participants on Day 1 and in the morning of Day 2 of the meeting. Abstracts of the input papers, which are now being refined, can be found in the next section of this report.

1.3 WORKSHOP DELIVERABLES
1) Key design elements for a gender responsive breeding program, including:
   a) Critical entry points in the breeding research cycle (including linkages to varietal dissemination and seed systems)
   b) Challenges for gender responsive breeding
   c) Available and needed tools for gender-responsive breeding

2) Participant feedback to help finalize input papers:
   a) Gender and social targeting in plant breeding
   b) Setting breeding objectives and priorities
   c) Working document (book) – Case studies of gender-responsive breeding programs

3) Uptake pathway for GBI outputs, including:
   a) “Good cases” that can lead by example, backed up by effective communication to key audiences about what is working
   b) Post-workshop webinars
   c) A plan to reach/communicate with young, early career breeders in CG and partner university departments
d) Policy brief for national programs and governments and networks making the case for the proposed changes

e) How do we make use of the papers? Intermediate set of guidelines distilled from the papers

f) Community of Practice for GBI

4) A fundraising strategy framework for GBI

1.4 ORGANIZING COMMITTEE

The GBI and its activities are coordinated by a committee of plant and animal breeders, as well as social scientists from across CGIAR Research Programs, centers, and partner organizations. This committee is a multidisciplinary group committed to mainstreaming the explicit consideration of gender-related information when making decisions about plant and livestock breeding aimed at producing research products to be used by resource-poor smallholder farmers. There are 10 committee members:

Alessandra Galiè  
*Gender Scientist, International Livestock Research Institute*

Béla Teeken  
*Post-Doctoral Research Fellow, International Institute of Tropical Agriculture*

Cynthia McDougall  
*Gender Research Leader, WorldFish and CGIAR Research Program on Fish*

Esther Njuguna-Mungai  
*Gender Specialist, International Centre for Research in Semi-Arid Tropics (ICRISAT)*

Eva Weltzien–Rattunde  
*Honorary Associate, Agronomy Department, University of Wisconsin – Madison, USA*

Graham Thiele  
*Program Director, CGIAR Research Program on Roots, Tubers and Bananas*

Hale Ann Tufan  
*International Programs, College of Agriculture and Life Sciences, Cornell University, USA*

Jacqueline Ashby  
*Gender Expert and International Consultant*

Juliet Kariuki  
*Post-Doctoral Fellow, International Livestock Research Institute (ILRI)*

Stefania Grando, Chair  
*Honorary Fellow, ICRISAT, India and International Consultant*
These accomplished professionals bring a wide range of experience and expertise to bear on addressing gender and breeding issues. Profiles on each member can be found at: http://www.rtb.cgiar.org/gender-breeding-initiative/committee-members/. The Committee worked closely with an experienced workshop facilitator, Sue Canney-Davison of Pipal Ltd. (Nairobi), to design the processes used to generate the envisioned deliverables of the Innovation Workshop and Tiff Harris, a skilled communicator who was charged to write this report.

1.5 OVERALL WORKSHOP PROCESS
The aim of the innovation workshop was to catalyze a shift to gender responsive breeding. It built on the outcomes of the 2016 workshop and benefited from the three main input papers. This set the scene for collectively drafting design principles for gender responsive breeding, laying out an uptake pathway and a linked funding strategy for the Gender and Breeding Initiative. About 50% of the participants also attended the 2016 workshop, which brought continuity to the discussions, which were seasoned with fresh perspectives and questions from those participants who had not.

Day 1 started by sharing the key points and feedback from the 2016 workshop, and set the stage for the workshop by answering the questions: What did we learn from the 2016 meeting on “Gender, Breeding and Genomics”, and what are the missing design elements for gender-responsive breeding that were identified in that workshop? The presentation began by highlighting the four principles of gender-responsive breeding (see glossary, poster 2.2, Appendix 4), and went on to describe what was needed to design and implement an effective gender-responsive breeding program:

1) Evidence of gender-differentiated preferences that are economically significant for a large number of people;
2) “Social Targeting and Demand Analysis” data and conclusions;
3) Identification of measurable trait values;
4) Understanding by breeders of how to achieve speedy selection for multiple target groups and their preferred traits;
5) Practical ways for breeders to set priorities among heritable traits for inclusion in breeding; and
6) Support from management in deploying multidisciplinary teams, including gender researchers and other social scientists, to make product advancement decisions in the context of the breeding cycle.

This presentation (given by Jacqueline Ashby) provided context for the overall body of work, highlighted the emergence of a more inclusive breeding cycle model (see Figure 2), and shared the seven “must haves” for gender-responsive breeding that came from the 2016 meeting and form the foundation for the design principles.

This was followed by presentations on and discussions of the three input papers that cover critical topics conceived at the 2016 workshop and delivered at this one. A presentation on *Gender and Social Targeting in Breeding* raised issues about the primary centrality of gender equity in a gender-responsive breeding cycle, as well as how to meaningfully layer gender disaggregated data, usually found in household surveys, onto currently available “big datasets”. Another on *Setting Breeding Objectives and Priorities* highlighted some practical tools that can be used and re-emphasized the need to design research that amplifies understanding about why men and women may have different trait preferences, not just that they do. And a third presentation about *Case Studies of Gender-Responsive Breeding Programs* highlighted the complexity of identifying and adequately defining the deeply embedded cultural, social, and economic gender differences that occur across all parts of a breeding and trait selection study.

Small group and plenary discussions following these presentations on Day 1 and Day 2 helped participants to internalize and make sense of how to be gender responsive, and made clear the multifaceted and complex aspects of the challenge. These discussions reinforced the decision to maintain the workshop’s focus on first contextualizing, and then jointly creating practical and actionable design principles.

In the afternoon of Day 2, useful tools and approaches were shared through a “World Café” approach (see Appendix 4) to maximize participants’ exposure to one another’s practical tools and findings before working in smaller groups for the remainder of the
meeting to develop the key design principles, ensure they are adequately comprehensive, and then synthesize and map them onto the breeding cycle. These efforts provided the basis for refining the collective group work into a 2-3-page brief, work that is moving forward now under the leadership of Jacqueline Ashby, supported by a smaller working group.

Other groups of participants delineated an uptake pathway for GBI outputs, a fundraising strategy framework, and outlined the institutional changes that are needed to effectively implement a gender-responsive breeding program. A key group of participants was the gender and breeding post-doctoral fellows, whose work was presented on Day 1 and who actively contributed throughout the workshop.
2. THE INPUT PAPERS

2.1 GENDER AND SOCIAL TARGETING IN PLANT BREEDING
Authors: Alastair Orr, Cindy Cox and Jacqueline Ashby

Gender and social targeting can improve the relevance and effectiveness of plant breeding programs intended to benefit resource-poor farmers. Currently, information about these farmers and their trait preferences is based on small-scale studies, which makes it difficult to set breeding priorities at the national or regional level. In consequence, their products may not meet the needs of resource-poor farmers, resulting in low adoption. We argue that plant breeding for resource-poor farmers requires a marketing approach. We show how the Segmenting-Targeting-Positioning (STP) framework from consumer marketing can be adapted to plant breeding programs for resource-poor farmers. We inventory large datasets, identify a minimum dataset of biophysical and socio-economic variables, and show how these variables can be layered for gender and social targeting at the national level. Finally, we suggest ways to improve the design of gender and social targeting studies in order to enhance their relevance for plant breeding programs.

2.2 SETTING BREEDING OBJECTIVES AND PRIORITIES
Author: Michel Ragot

This presentation explained the need for setting breeding objectives in order for breeding to deliver varieties/breeds that create value for their stakeholders. It was noted that breeding had begun a long time before modern breeders and the separation of breeding as an activity from farming itself by farmers was what had created the need to set objectives. The presentation drew on a Survey Monkey of public and private breeding programs with 110 respondents, some initial more in-depth case studies of some selected breeding programs, and the author’s personal insights into setting breeding objectives.

From the survey, over 50% of private sector respondents strongly agreed that their organization used a formal process for setting breeding objectives; this compares to just over 30% of public sector respondents. Less than 10% disagreed that they used a formal process. The survey further showed large variation in terms of sources of information used and the stakeholders involved in setting breeding objectives. In particular, significant public/private and regional differences were found for socio-economic and/or gender-disaggregated data used in setting objectives.

Information about markets and demand is a key element in setting breeding objectives. This information was often “collected” directly by breeders through interactions with
market actors (growers, value chain entities, and end-users), especially in smaller organizations, but by marketing groups in larger organizations.

In terms of the numbers of traits used in product profiles, about 40% used from 6-10 traits, 30% less than 5, and 20% more than 10. Almost all those using more than 10 traits were in the private sector. A useful template for developing product profiles was presented, which includes key traits, their reference levels, and the priorities given to each.

The presentation concluded that using a formal and documented process to set breeding objectives and priorities was almost unanimously recognized as a desirable/good practice. However, reality often lags intentions. Several inhibiting elements were identified. Including the need to enhance market “pull” on breeding objectives, and the operational constraints in formally setting breeding objectives. It was noted that most successful breeding programs generally had or have clear and persistent objectives and priorities.

2.3 CASE STUDIES OF GENDER-RESPONSIVE BREEDING PROGRAMS

Authors: Multiple

Presenters: Stefania Grando, Hale Ann Tufan, and Catherine Meola

During the “Gender, Breeding and Genomics” workshop held in October 2016, strong interest was expressed in developing a book or collection of case studies about gender-responsive breeding programs. Thirteen potential studies were presented at the 2016 workshop, and the initial discussion of these focused on determining the extent to which each study answered five guiding questions: 1) At what stage of the breeding cycle did you identify gender-differentiated preferences for one or more traits and what were these preferences? 2) How were these preferences identified? 3) Which changes in the structure of the breeding program did you make to address differences in preferences identified? 4) Which specific tool(s) was (were) used to address gender-differentiated preferences? and 5) What were the final products and their uptake by men and/or women users, and what benefits (e.g., improved food security, income) did different user groups obtain as a result?

As a next step, a broad set of criteria was developed to further refine the selection process. These criteria range from the study being clearly mapped to a step in the breeding cycle, to the collection and use of sex-disaggregated data, to the utility of the findings, conclusions, and discussion in developing design principles for gender-responsive breeding programs. Considerable selection emphasis is also given to assessing the synthesis of the tools used in each case study, and the lessons learned from the work.
A total of 7 case studies from the original 13 were submitted and were sufficiently well developed by the time of the workshop; these were briefly summarized during the Innovation Workshop. The presenters emphasized, however, that there is scope for additional case studies to be included in the collection. Three steps in the breeding cycle are especially weak or underrepresented: 1) The identification of new variation; 2) the release of new varieties; and 3) the production and distribution of improved seed. Moreover, livestock- and fish-related case studies are missing entirely from the current collection. The presenters made a plea to the workshop participants for additional case studies to fill these gaps.
3. WORKSHOP DELIVERABLES

3.1. DESIGN PRINCIPLES AND DECISION MAKING FOR GENDER-RESPONSIVE BREEDING

What did we do?

The innovation workshop was intended to help catalyze a shift to gender responsive breeding. The workshop involved the multidisciplinary team from the first workshop and a broader group of participants. In the first part of the workshop they discussed commissioned papers on social targeting, public and private sector approaches to setting breeding objectives and case studies. Woven through this first part was guidance on evidence based design principles for gender responsive breeding. These design principles built on the “must-haves” for gender responsive breeding from the first workshop (Figure 1).

During Day 2 of the workshop, small groups were assigned different “must-haves” shown in Figure 1, along with a set of guiding questions they were to answer:

1) How is the “must have” expressed as or incorporated into a design principle?
2) Key actions to be taken?
3) Gap in breeding program to which the design principle responds?
4) Outcome(s) anticipated from action?
5) Stage of breeding cycle to which the design principle relates?
6) Evidence of efficacy?
One small group worked on a product development process that could be used to guide the breeding cycle (Figure 2) under the overall management of an interdisciplinary team, one that includes gender researchers and other social scientists to provide a demand perspective for the breeders on the team.

Different breeding programs use a range of product development processes, including the proprietary “Stage-Gate” model (REF: www.stage-gate.com). During feedback, it was decided that product development could provide an overall organizing framework for incorporating other “must haves” formulated as key decision points, or gates, for advancing from one breeding stage to the next.

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### Figure 1. The 2016 GBI Workshop “must-have” features of gender-responsive plant or animal breeding

<table>
<thead>
<tr>
<th>Targeting</th>
</tr>
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<tbody>
<tr>
<td>• Define social target groups at national and regional scales in terms of gender, living standards and where they live in breeding mega-environments</td>
</tr>
<tr>
<td>• Use a sampling frame to collect representative data on social target groups’ trait preferences</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Priority setting</th>
</tr>
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<tbody>
<tr>
<td>• Characterize and prioritize desired traits for prototype products aimed at target group(s)</td>
</tr>
</tbody>
</table>

<table>
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<tr>
<th>Trait values</th>
</tr>
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<tbody>
<tr>
<td>• Define gendered trait values, determine whether these are heritable and assess genetic, economic and cultural trade-offs</td>
</tr>
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<tr>
<th>Genomic selection</th>
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<tbody>
<tr>
<td>• Target crosses based on well-defined products for well-specified gender-disaggregated target groups in the associated breeding environments</td>
</tr>
<tr>
<td>• Develop varieties for these target groups using genomic selection to gain precision and accelerate the breeding process</td>
</tr>
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<table>
<thead>
<tr>
<th>Feedback</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Manage product advancement as a multidisciplinary team decision based on feedback from different sources, including representative, sex-disaggregated end-users</td>
</tr>
</tbody>
</table>
The overall sequence of key decision points recommended for implementing gender-responsive breeding is shown in Figure 3 on page 19. This sequence follows the process of product development that, in a breeding program, is commonly referred to as the breeding cycle, as explained below. For each stage in the breeding program (the blue diamonds in Figure 3), there are one or more critical gender-responsive decisions defined (the green boxes in Figure 3) and a result (the gold circles in Figure 3). The information required to inform each of these decision is explained in the following section.

**Gender-responsive decisions at different stages in the breeding cycle**

If followed, the critical decision points in the breeding cycle can ensure that breeding is gender responsive by making use of the gender-relevant decision criteria. These criteria must be informed by representative gender differences, generalizable to a target population of intended users.

The decisions shown in Figure 3 follow the usual process of product development in the breeding cycle. Note the importance of applying gender-relevant criteria early in the cycle,
when making decisions about targeting, sampling and breeding objectives, as well as throughout the rest of the steps in the cycle. The starting point is social targeting and demand analysis. In Figure 3, targeting and demand analysis are broken into three critical decision points. The next step in the breeding cycle involves setting breeding objectives, and it is in this stage where the product profile is fully developed (Figure 3), and the use of gender-responsive criteria for valuing different traits is essential. The next major step in the breeding cycle involves creating genetic variation, a process that involves decisions about which materials to use, and these decisions must also reflect consideration of gender-relevant criteria. In the final stage of the breeding cycle, key decisions are made about variety release and seed production, and these too require using gender-responsive decision criteria.

The product development sequence in breeding illustrated in Figure 3 starts with SOCIAL TARGETING and SAMPLING. It is in these initial stages of the cycle that understanding of how gender inequality influences demand for actual or future breeding products, in particular for specific traits, must be improved. The development of customer profiles as indicated in the green box results from characterizing and prioritizing representative sex-disaggregated social groups, based on understanding how gender relations affect their access to resources and technology choices.

Critical to completing these stages are decisions about:

- What criteria will be used to identify different groups of users with common constraints, opportunities and needs?
- How to ensure that the results of gender analysis are representative of a given target group of users?
- Who is demanding which traits and why?
- What socioeconomic criteria will be used to prioritize one group and the traits they demand in preference to another group?

This requires information about:

- Sex-disaggregated data relevant to demand for breeding products, such as access to and ownership of land, livestock, labor, capital, income, agricultural inputs, markets, and development services.
- Gender differences in demographic characteristics, such as age, ethnicity, religion, race, education level, and literacy.
• Gender norms, roles and responsibilities that affect technology choices and how crops and animals are used in rural organizations, such as the family, the farm, the community, cooperatives, self-help groups, water associations, and agribusinesses.

**SOCIAL TARGETING:** Uses the information described above to identify and then prioritize social groups with common characteristics as users of actual or future breeding products. First, a population of interest is segmented into groups with common needs, opportunities and constraints. Then, targeting involves further analysis to set priorities among groups from equity and other development policy perspectives, taking gender into account. This analysis narrows the number of potential groups deserving attention.

**SAMPLING:** Makes sure the data used for targeting, and for the resultant customer profiles, are representative of the sex-disaggregated population(s) that the breeding program expects will adopt its actual or future breeding products. This requires design of a sampling frame that will permit inferences to be drawn about a population of users from samples used for studies of demand conducted at different scales and with different methods. Once target groups have been characterized, gauging the demand for different traits and breeding products from each group follows. Gender differences will not always be important for preferences in all groups, because in some circumstances men and women producers have a similar demand for traits.

**SETTING BREEDING OBJECTIVES:** Considers the overall outcomes that breeding is intended to achieve. Use of the suggested gender-responsive decision-making criteria will help programs to better understand the gender equity outcomes of varietal uptake, and the specific gender-related opportunities and limitations which might influence that uptake.

**IDENTIFICATION OF DEMAND FOR TRAITS:** Involves use of representative information to define and explain the trait preferences and priorities of sex-differentiated groups identified during targeting. It is essential to understand why gender differences prevail in preferences and how reasons for different preferences are related to adoption, including the way dissemination and uptake are affected by gender. This information is needed for defining decision criteria that can be used to set priorities among traits, once these are valued in the next stage. Descriptions and explanations of gender-differentiated trait preferences must be generalizable to a population defined as a target group, and can be generated using many different methods, including surveys, participatory varietal selection, focus group discussions, and key informant interviews.
VALUE TRAITS: Involves development of a **PRODUCT PROFILE** that considers relevant
gender-responsive socioeconomic and biological criteria together (see Figure 3) to decide
which traits hold the greatest promise for breeding.

- Gender-responsive priority setting combines insights about users’ most important
  preferred traits with scientific information about those traits – for example, their
  heritability, pathology and physiology – as well as information about how products
  (such as seeds) will be delivered to male and female users. A well-developed
  product profile comprises a tool that can be used to decide which products should
  be given priority.

- Assessment of feasibility involves determining which gender-responsive traits are
  technically feasible for inclusion in breeding-related decision-making, as well as the
  cost of including them and their effect on the breeding timeline. Cost-benefit
  analyses, as well as assessments of expected impact, are needed to inform
  decisions by a breeding program about adding gender-responsive traits to its
  breeding objectives.

CREATE GENETIC VARIATION: Consists of obtaining genetic resources and making crosses
to generate the variation that may be required to produce varieties or breeds that satisfy
demand for the priority gender-responsive traits. Use of gender-responsive decision
criteria and related information included in the Product Profile in the choice of genetic
resources to make crosses (e.g., choices among local germplasm or elite material) will help
make sure critical decisions about parent material includes consideration of gender. The
Product Profile defined previously, when traits were valued, may be adjusted based on
the results of this stage.

SELECT GENOTYPES: The iterative process of identifying superior genotypes to achieve the
objectives set out in the Product Profile. Advancement decisions include gender-relevant
criteria, derived from the Product Profile. Gender-responsive tools can be used for
selection of genotypes. For certain traits and phases of selection, participatory methods
should be considered to ensure male and female user perspectives that represent the
target groups defined earlier in order to influence selection.

SEED PRODUCTION AND DISTRIBUTION: Requires purposively managing the product
launch and promoting varietal uptake so that gender equity is promoted. Careful
consideration of key gender constraints and opportunities in delivery – for example, the
availability of credit for purchasing seed or the need for refrigeration of a vaccine – will
have been considered when Product Profiles are developed.
What happens next?

Drawing on the design principles summarized here and the outputs of the small groups, a brief is being prepared describing the key gender-responsive decision points or gates around the breeding cycle. This will link with the more detailed explanations of social targeting, market segments, customer profiles and product profiles described in the input papers to provide a gender-responsive overlay. This will provide the foundation for setting breeding objectives and for implementing the successive stages of the breeding cycle in a gender-responsive manner.
Figure 3. Flow chart of critical decision points for gender-responsive breeding
3.2 Promoting Gender-Responsive Breeding (Uptake Pathways)

Group members: Thokozile Ndhlela, Bela Teeken, Vivian Polar, Cu Thi Le Thuy, Chiedozie Egesi, Rhiannon Pyburn

Theory of Change

In order to achieve the development of varieties, strains and breeds that respond to the different needs and challenges of resource poor men and women farmers AND increase the adoption of varieties that contribute to poverty reduction and equity, we need to develop an advocacy strategy and generate evidence to influence civil society, CGIAR centers, NARIs, decision-makers and the donor community, as well as agricultural universities. This should recognise the value of gender-responsive breeding AND develop design principles to contribute to product profiles for gender-responsive breeding.

Project components (outputs of Gender Breeding Initiative)

Must have outputs

- Evidence base: statistical framework; low hanging fruits; post-mortem analysis of failure/ poor adoption
  - Baseline of decision making processes mapped in setting breeding priorities
  - Evidence that gender-response breeding matters in terms of productivity, adoption and equity impact studies with and without gender integration
  - Need sampling strategies, resulting in well-defined target beneficiary groups, protocols for getting evidence)

- Design Principles for Gender Responsive Breeding

- Advocacy strategy and champion around ‘pain’ of non-adoption and gender inequity’
  - Communicate GBI case studies and impact

Secondary outputs

- Roadmap for “infiltration” strategies into other platforms
  - CGIAR Collaborative Platform for Gender Research
  - Excellence in Breeding Platform
  - CRPs and Centers
  - Regional Universities Forum for Capacity Building in Agriculture (RUFORUM)
• **Vibrant community of practice providing advocacy and support for gender responsive breeding**
  o Collaborative and active platform for communicating and developing iteratively and retrospectively strategy frameworks for gender-responsive breeding
  o Online community of practice
  o Library of well decided case studies of gender-responsive breeding and failure to do so (quality control)
  o Virtual “helpdesk” and discussion forum sharing ideas
  o 6-8 dynamic young professionals with strong gender responsive breeding competencies

• **Library of cases**
  o What was tried and worked, tried and failed, non-adoption due to gender blindness

• **Gender responsive breeding toolkit**

**Next users - outcomes**

• **Different levels of decision makers in (CG) research organization recognize the importance of gender responsive breeding’**
  o CGIAR Breeding programs and scientists are evaluated and rewarded based on their level of gender responsiveness.

• **Fully developed strategy for gender responsive breeding and linked tools for the complete breeding cycle**

• **Adoption of GBI design principles, strategy and correct tool selection across X CG centers/stations**
  o First influence CGIAR and then national partner breeding programs

• **‘Product profiles of programs including 2 gender-driven traits’**
  o Gender responsiveness included in an explicit manner in four RTB (and other) breeding programs

• **Agricultural Universities, Regional Universities Forum for Capacity Building in Agriculture – (RUFORUM), INOs providing training and support in breeding social sciences**
  o Incorporation of gender responsiveness into breeding curricula of x universities
• CGIAR Breeding programs and scientists are evaluated and rewarded based on their level of gender responsiveness.

• Donor community recognize the importance of gender responsive breeding to advance poverty reduction and equity

• High profile visibility civil society organizations and champions concerned with gender-equity’

End users – outcomes

• Varieties, strains and breeds respond to the different needs and challenges of resource poor men and women farmers

• Increased adoption of varieties and ultimate increased productivity, quality and contributes to poverty reduction and equity

Next steps in the uptake pathway

• Identify indicators

• Define activities

3.3 GBI FUNDRAISING STRATEGY

Group members: Graham Thiele, Hugo Campos, Seamus Murphy, Hale Ann Tufan, Juliet Kariuki; with input from the Uptake Pathways group (Thokozile Ndhlela, Bela Teeken, Vivian Polar, Cu Thi Le Thuy, Chiedozie Egesi, and Rhiannon Pyburn)

Pitch (story) – selling the strategy

A text that builds a case around the importance of addressing gender in breeding needs to be written. It should focus on the “pain points” with key stakeholders and donors to leverage interest. One pain point is limited adoption of improved varieties in many African food systems with some evidence that this reflects a failure to consider user perspectives. And hence the entry point to resource mobilization around the potential benefits of gender responsive breeding for scaling and adoption.

Project Work Packages

1) WP 1: Evidence – Evidence base: statistical framework; low hanging fruits; post-mortem analysis of failure/poor adoption. Evidence that gender-responsive breeding matters, in terms of productivity, adoption, and equity impact studies, with and without gender integration.
2) **WP 2: Advocacy** – Advocacy strategy and champion around ‘pain’ of non-adoption and gender inequity.

3) **WP 3: Development and validation of Design Principles**
   - Piloting with ongoing or planned breeding program;
   - Design Principles for Gender-Responsive Breeding;
   - Assess institutional, team and individual needs to implement a gender-responsive breeding program;
   - Big Data approaches.

4) **WP 4: Community of Practice**
   - Library of well-designed case studies of gender-responsive breeding and failure to do so (quality control).
   - Gender responsive breeding toolkit
   - Helpdesk and discussion forum sharing ideas
   - “Roadmap” for infiltration strategies into other platforms, i.e., the CGIAR Gender Platform, excellence in breeding, Big Data, gateway function

5) **WP 5: Capacity building** – Continue current PDFs and further students/PDFs. Consider paired scientists (gender and breeders), embedded in breeding programs, but associated through GBI to integrate and link work.

6) **WP Management**
   - Baseline of decision making processes mapped in setting breeding priorities.
   - M&E for GBI. Institutional scorecard
     - Gender responsive breeding toolkit;
     - 6-8 dynamic young professionals with strong gender-responsive breeding competencies.

**Options for Project Design**

**Option 1:** Full package around the breeding cycle provided to each targeted program: needs assessment, baseline, pilot, PDFs Capacity Development, M&E.

**Option 2:** Use a piecemeal approach to picking different stages for gender-responsive breeding based on selective bids. Period of support could be for 3 years. For example, one piece could be work aimed at targeting with STP methods; a second activity could focus on
setting breeding objectives and valuing traits economically to establish breeding priorities; a third could focus on PVS; and a fourth on product delivery and feedback.

**Pilot the Advocacy Strategy**

**Proposed Funding Envelope**

$5-8 Million

**Potential Donors:**

- BMGF
- IDRC
- ACIAR
- SDC
- DFID
- EC
- Syngenta Foundation
- Irish Aid
- WB
- ADB
- SIDA
- CIDA
- Norad
4. RECOMMENDATIONS FOR INSTITUTIONAL CHANGE

Group members: Lora Forsythe, Stefania Grando, Birhanu Lenjisu, Yoseph Beyene, and Alessandra Galie

During the workshop, it became clear that institutional support is needed to embed the design principles into gender-responsive breeding programs. In particular, there is a need to support social scientists having access to and processing the relevant data and facilitating the joint programming and decision making with breeders, social scientists, economists and others at key points of the breeding cycle design. It was agreed that this higher level of institutional activity is not a design principle as such, but a key factor to enabling their use. A working group was set up on Day 3 to outline what institutions need to do.

The main question is: What needs to change in institutions to create an enabling environment for gender-responsive breeding?

“Institutional change” means change in formal and informal rules at the following four levels: breeding programs; institutes; the CG System; and the informal attitudes of all involved.

The Group assessed the key steps for gender-responsive breeding and how institutions need to recognize its importance and act on it.

Recommended changes (“must haves” are underlined) include the following.

CG System level:

1) System level representatives should work with donors to ensure that funds support gender-responsive breeding (for example, help to modify the BMGF breeding program assessment tool so that it has explicit modules on gender-responsiveness);

2) Ensure that evaluation of breeding programs includes gender-responsive criteria;

3) Establish a monitoring system for issues relating to gender in the workplace;

4) Establish a monitoring system for gender research, including gender-responsive breeding, budgets, and resource allocations;

5) Bring the CG Gender Platform back to the System level.
CG Institutes:

Overall:

1) Include a gender focal point (team leader, scientist etc.) in the institute’s management committee

Evaluation and reward system:

2) Reward multi-disciplinary outputs – including publications (e.g., in staff evaluation)
3) Multi-disciplinary resource mobilization teams
4) Assess impact on overall goals, not just adoption
5) Assess teams – not just individuals – to incentivize teamwork
6) Include “gender sensitiveness” among the evaluation criteria of staff

Staffing and staff capacity:

7) Assess the completeness/balance of teams and identify capacity gaps at the institute and program level, and take corrective actions (including build capacity of teams) – e.g., annually during review and planning meetings
8) Ensure that job competencies include experience in multi-disciplinary work (with a focus on gender)
9) Address gender in the workplace issues to increase coherence (e.g., policies and approaches to retain female staff), but do not assume that female staff or gender scientists are the ones to address gender in the workplace issues

Budgeting:

10) Allocate budgets to each key discipline to enable them to address gender issues, both at the program and institute level
11) Support strategic gender work to gauge the potential impact of gender-responsive breeding
12) Recognize and budget each discipline with equal weights to ensure that gender scientists are considered part of the “core team” – as much as breeders and other scientists/specialists

Communication:

13) Promote communication that shares outputs/achievements from all disciplines, and gender (e.g., seminars, blogs, internal communication channels) to add to existing data that supports the rationale for gender research
Breeding Programs:

The core of the breeding cycle is standardized. The group discussed what needs to be included within the steps of the cycle to enhance gender-responsiveness. It is the “how” that makes a program gender-responsive. The group listed the key points in a gender-responsive breeding program and then focused on the how.

**Key moments:**

1) Include gender considerations in the goal
2) Gender-sensitive target grouping
3) Customer profile is also gender-responsive
4) Trait preferences are gender-sensitive
5) Product profile is also gender-responsive
6) Decisions about advancing selections (moving from stage 1, to stage 2, to stage n, to release) is also gender-responsive
7) Include women and men in participatory varietal selection and possibly trials grown on farms of women and men
8) Include various tests to check responsiveness of trials (e.g., cooking, etc.)
9) Include assessment of impact of new varieties vis-à-vis goals

**How:**

10) Need to include a multi-disciplinary team in all these stages (gender scientist, breeder, system specialist, any other relevant scientist, e.g., food scientist)
11) Review and planning meetings include the multi-disciplinary team
12) Assign budgets also to all components, including the gender component
5. APPENDICES

5.1 APPENDIX 1: SUMMARIES OF SMALL GROUP DISCUSSIONS THAT CONTRIBUTED TO DESIGN PRINCIPLES

Group 1: Define social target groups

Participants: Jacqui Ashby, Cu Thi Le Thuy, Eva Weltzien, Alastair Orr, Alessandra Galie

Key actions by multidisciplinary team:

1. Identify the overall goal (with a gender dimension)
2. Identify broad target groups in production and consumption
3. Broad profiling of 2
4. Break down 2 by typologies
5. Identify agro-ecological/farming systems
6. Identify relevant crops/species for 5
7. Refine target groups (aware of gender accommodative and transformative), e.g., Actual ‘doers’; knowledgeable ones, new opportunities for 5 and 6
8. Identify criteria for 7 including: size, gender, homogeneity of needs, opportunities for improvement
9. Profile 7: gender-sensitive customer profile
10. Document process and information

7 and 8 are related and interchangeable

Gap: proper and gender-responsive identification of target group

Anticipated outcomes:

1. Clearer boundaries and characteristics of target groups =>
2. Better targeting of gender-responsive interventions and products
3. Identification of missing people to be targeted
4. Identification of missing products for target people
5. Gender is not lost!
6. Improved monitoring, learning and impact
7. Strong bases for cross-disciplinary collaboration
8. Stronger rationale for our work =>
9. More funding!
10. Customer profile + product profile = scale out!
11. More impact!

**Stage of breeding cycle: ‘social targeting’ stage, very beginning**

**Evidence of efficacy:** we’ll test and let you know!
Group 2: Use sampling to ensure that gender differences to be addressed by breeding are representative of social target groups at national and regional scales

Participants: Seamus Murphy, Cindy Cox, Esther Njuguna, Kayte Meola, Hale Ann Tufan

Feedback comments: 1) too generic and lacks focus, how do we incorporate this into breeding initiatives and their specific products, 2) how do we extrapolate local sampling of cultural norms to national scale (is it possible?), 3) suggestion to include product/user profile ethnography. (clarification needed between Group 2 & 3 – Group 3 is focused on characterizing users/Group 2 is focused on sampling)

In response, we offer a step-by-step/flow-chart/how-to process:

1. Taking an example of crop x women and men farmers in driest agro ecological zone in Northern Nigeria. Breeding objective is improving nutrition and breeding program has produced bio-fortified crop x. Targeting nutrition in stratified poverty group in that region is group’s task. How to sample this target social group?

2. Create first diversity panel of these varieties being released by breeding program.

3. Big data steps looking at regional scale variables focusing on high-poverty households, geographic 10x10 poor rainfall data cells, agronomic mapping, all around crop x West Nigeria etc.

4. Key Informant Interviews with communities, extension workers, breeders for crop x in that region. This is to inform experimental design before going into region with full genetic package – i.e., who to talk, where and who within those communities that relevant to crop x?

5. Gender responsive methods for sampling of following two steps:
   a. FGDs to capture information about production systems, trait preferences, problems around that crop, gender roles and responsibilities, ‘what are your experiences, challenges, uses?’ (saturation protocol). Potentially important to include foresight analysis in FGDs.
   b. Participatory evaluation of breeding material and land races of crop x – to be decided.
   c. Gender-responsive interviewing techniques for sex-disaggregated data collection focusing on nutrition, anthropometric scoring of mother-child pairings, intra household decision making, bargaining power.
   d. Feedback loop set up between data and breeders.
Example of using sampling to ensure that gender differences addressed by breeding are representative of social target groups at national and regional scales

1) For a well-defined region (or country), create a set of breeding materials – varieties and landraces – that display traits a) of known importance to breeders, b) of known importance to farmers, and c) deemed to be of potential future importance by breeders, industry or farmers.

2) Use large-scale data sets at a regional scale to segment the region’s population into homogeneous groups, using socio-economic and agro-ecological variables. For example, the rigor of sampling could be improved by using pixelated data sets focused on combinations of biophysical variables that are known to determine traits, and social variables that are known to determine choices among traits or technologies.

3) Sample within population segments to select sex-disaggregated respondents as key informants and/or focus groups for rapid appraisal interviews. The purpose of the interviews is to obtain qualitative data about production systems, gauge current and future demand, identify problems related to the crop of interest, gain clarity on gender roles and responsibilities, and identify what factors determine choices among technologies. Use of multi-stage cluster sampling may be appropriate.

4) Use the combined regional-level and qualitative information to a) test the validity of previously defined population segments, and b) refine the definition and characterization of population segments.

5) Sample within refined population segments to select representative male and female users with whom to conduct participatory evaluation of the set of varieties defined in step 1. This is a diagnostic exercise to establish the relative importance of different traits to different kinds of users. Collect sex-disaggregated socio-economic data to characterize each respondent in the participatory evaluations.

6) Analyze this information to delineate distinct, homogeneous sets of ranked trait preferences and the socio-economic characteristics of the users who express a given set of preferences.

7) Map sets of users and their preferences onto the sampled population segments defined previously at a regional scale.

8) Use this information to a) assess the importance of population segments and prioritize those that the program will target, and b) generate customer profiles for the selected target segments.

9) Ground truth the customer profiles.

10) Incorporate information about sets of trait preferences and associated customer profiles into product profiling.

- **Two scales:** national and regional scales require different sampling. Is this possible, desirable, necessary for given study of breeding programs? Is it just about social target group period? Target groups are defined by ecology, market, socio-economic, cultural, geographic contexts, rather than national.
If we want to represent impact assessment of breeding interventions at national scale then we need to consider skewed national statistics in post-project stage of specific outcome. Consider also spill-over effect in these ex-post analyses.

- **Quantitative Sampling**: How do we design sampling and what methods ensure it is representative of that area.
  - This first means considering the main research question, i.e. nutrition, productivity, soil conditions, market supply. This informs the first geographic sampling framework.
  - Second, we need to review the big data availability that includes those variables that are suitable to those research questions.
  - Once geographical and physical sampling framework, then third stage of sampling examining variables of people/social/socio-economic variables.

- **Qualitative Sampling**:
  - First step: Review of previous literature provides first guidelines in saturation protocols.
  - Second step: Key informant interviews then provides information to guide number of different types/kinds of FGDs to facilitate, with regards to different social categories/groups.
  - Third Step: FGDs of different social categories - FGDs require checklists to ensure rigor in addressing gender differences. FGDs can/cannot be representative of geographic areas or larger social target group? Question is then - how many FGDs do we need to conduct? Saturation is the key sampling protocol for this - i.e. we've reached saturation when no new information is popping up.

- Key summary points for this design principle in sampling: **Mixed methods needed that ensure sampling of gender differences that are representative**:  
  1. Key informant interviews used to identify major research questions relevant to those areas, along with panel discussion with experts and public officials.
  2. FGDs and saturation protocols. Qualitative FGDs used more as pilot studies to identify further key questions for next stage and to identify different stakeholder groups in that regional context.
  3. Household quantitative questionnaire that addresses gender differences

- Design principle critical to probing stage is understanding the significance of certain social differences or specific variables of/between social groupings and beneficiaries.
This requires flexibility, feedback, iterative learning in the development of our data collection (‘adaptive learning’ – Google it!)

- Next stage: Household surveys using quantitative methods provide the representative sample.

- Bottom line to these suggestion is budget constraints for social research needed.

- Evidence of relevance of design principle - citation:
  - www.usaidlearninglab.org/faq/collaborating-learning-and-adapting-cla
    - Resource for adaptive learning methods
  - www.cifor.org/publications/pdf_file
    - Resources for collaborative adaptive management

**Group 3: Characterize and priorities traits desired by the different target groups**

**Participants:** Netsayi N Mudege, Michel Ragot, Juliet Kariuki, Pricilla Marimo, Lora Forsythe, and Vivian Polar

**Collect gender disaggregated data on trait preferences**

- Assumption that the lists are collected and are already ranked in must have principles 1&2 at community level (taking care of all target groups including gender)

- Identify preferences of different target groups using the tools identified on design principle 2.
  - Use participatory methods to identify the preferences and investigating why these preferences are important for men and women users
  - Use participatory community ranking methods with target groups of men and women (separate groups) to rank and prioritize the traits preferences.
  - Collect trait preferences from other stakeholders

- Translate these into breed-able traits (genetic/measurable traits)
  - May need to consult other disciplines/experts (e.g. food technologists etc.) may need a trait dissection (dissection of a trait into simple components)
    - Decide whether the trait need to be maintained (keep threshold) / improved.
      That has cost implications for the breeding program
- If not genetic traits we may pass this information on to other actors in the value chain...it could be processing technologies that need to be addressed.

- Add breeder traits that may not have come out of farmer listed traits but that are still important for a breeding program.

- Product profiles (list of traits, benchmarking, flag any gender specific issues about the product, and also rank the different traits in terms of importance)
  - Consult and clarify with farmers and breeders (through a validation process) on traits and their importance once traits have been prioritized (consult with different target groups including men and women)
    - We can use the following tools during consultation
      - There are tools such as matrix of preferences
      - 1000 minds
  - Highlight what is the gender specific component in the product profile. Highlight the different interests of the target groups and possible conflict.
  - The ranking of priorities should also be done in a sex disaggregated manner
  - Ask for the trade offs

### Table: Product Profiles

<table>
<thead>
<tr>
<th>Identified</th>
<th>Flag any gender specific issues in the product</th>
<th>Explain why the traits are important (for example the ones selected by breeders)</th>
<th>Benchmark Performance</th>
<th>Priority 1=Must have 2 =Important 3=Nice to have</th>
</tr>
</thead>
<tbody>
<tr>
<td>From social target groups (including gender and socio-economic groups)</td>
<td>Trait 1</td>
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<td></td>
<td>Trait 2</td>
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<td>Trait 3</td>
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<tr>
<td>Other things important to make the product from other sources such as breeders or other value chain actors</td>
<td>Traits 4</td>
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<td></td>
<td>Trait 5</td>
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<td>Trait 6</td>
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- Develop a dictionary of the traits as part of characterizations (Ontology)
  - A list which tells what the trait is and how do you measure it
Gap in breeding program which design principle responds to

- Will impact setting breeding priorities?
- Also, the release of cultivars to make sure that the varieties meet the needs of the different target groups
- Data was not being collected from an intersectional approach but this principle solves this buy emphasizing on the different target groups.
- Multidisciplinary approach where different disciplines can contribute to the validation of priorities (e.g. food scientists) (Multi-disciplinary panel and users and other stakeholders)

Outcomes

- Product profiles (list of traits, reference for performance)

<table>
<thead>
<tr>
<th>Identified</th>
<th>Benchmark Performance</th>
<th>Priority 1=Must have 2 =Important 3=Nice to have</th>
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<td>From social target groups (including gender and socio-economic groups)</td>
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<td>Trait 6</td>
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Stage of breeding cycle

- Setting breeding priorities
- Release of new varieties
### Group 4: Target crosses based on well-defined products for well-specified gender-disaggregated target groups in the associated breeding environments

**Participants:** Thokozile Ndhlela, Prakash Gangashetty, Rhiannon Pyburn, Birhanu Lenjiso, Ranjitha Puskur

| Key actions to be taken | A definition of breeding environments and appropriate disaggregation of target groups based on relevant criteria should be followed by identification of specific products demanded by the different groups. This will set in motion identification of traits that are needed to develop the products and hence, definition of the product profiles targeted to different socio-economic groups. This will involve exploration of tradeoffs and ex-ante analysis of benefits and costs to determine priority gender-responsive traits. **Actions:**  
• Once the product profiles are developed a decision needs to be made whether the breeding program will pursue development of the products identified.  
• If the program decides to go ahead with it, source germplasm needs to be checked to explore whether the traits are available in the breeding materials.  
• The program needs to characterize available ‘untapped’ germplasm.  
• If not, new germplasm needs to be sourced. This is another decision-point requiring commitment of funds/resources.  
• This would require an ex-ante analysis of costs of inclusion of new traits and anticipated impacts to establish the economic justification. It should also include an assessment of costs of not being gender-sensitive.  
• If justified, crossing can begin and the rest of the breeding cycle follows.  
• To enable the above actions, it is necessary to set up an institutional mechanism/process defining these and accountability mechanisms set up to ensure adherence.  
• This also needs setting up multi-disciplinary teams to be involved in key decision-making processes/moments. |
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<tbody>
<tr>
<td><strong>Gap in breeding program this principle is addressing</strong></td>
<td>Making breeding decisions based on social and demand analysis</td>
</tr>
<tr>
<td><strong>Outcome anticipated from action</strong></td>
<td>More equitable and impactful products</td>
</tr>
</tbody>
</table>
| **Evidence of efficacy** | a. Eva’s case of Sorghum in Mali (Personal communication)  
b. Pre-cooked beans case from PABRA |
Group addressing “must-have” principles 5 and 6:

Participants: Yoseph Beyene, Stefania Grando, Thiago Mendes, Meredith Bonierbale, Jean-Luc Jannink

# 5) Define trait values by measuring priority traits, determining whether they are heritable, and assessing the genetic, economic, and cultural trade-offs.

Key Actions

The difference between “breeding as usual” and “gender-responsive breeding”:

1. An interdisciplinary team that includes a gender specialist who brings to the table the definition, the reasons, and the (economic) importance of different traits.

2. Processes of validation, participatory through the value chain, that ensures that change in the breeding population and released varieties are consistent with the desire of the target segment.

Standardized interdisciplinary trait prioritization process

0. Establish an interdisciplinary team that contains at least a social scientist and a breeder, perhaps also an agronomist and pathologist (other specialists...). Dialogue within that team. Understand the trait and why it is important. Ensure the team understands the current selection goals: it may be that the new trait is already being bred for under a different guise. It may be possible to achieve through management rather than breeding. Determine that the new trait is minimally tractable: there is a way to measure it within budget constraints. If the trait can be incorporated into varieties, what is its economic value per unit of improvement? Validation within the value chain: the trait that we will measure, does it respond correctly to the target group demand? Are there traits the breeders select for which there is no obvious reason from the point of view of the target group, but the breeder has a reason? Explain that and share the breeder rationale. The team needs an overall framework to jointly understand traits.

1. Perform an initial genetic study. What is the current mean value of the trait in the breeding population and in varieties available to growers, relative to the required value for it to make an impact? What variation is there in the trait? What is its heritability? What correlations does it have with traits currently under selection? Bring results to a discussion with the team in terms that all can understand: What is the probability of success of reaching useful trait values? What trade-offs are likely relative to current selection goals? Components of the dialogue under 0 may need to be revisited.

2. Study trait measurement. Are there less expensive but highly correlated proxies? Can new measurement technologies be developed to reduce costs and increase throughput?
Bring results to a discussion with the team. Success in improving trait measurement may increase trait weighting in the selection index. Would that success / failure have consequences for the product profile? Validation within the value chain: the proxy trait that we will measure, does it respond correctly to the target group demand?

**Output:** Revised, tractable product profile.

**Outcome:** Significant adoption by target groups.

**Impact:** Equitable benefits of breeding efforts.

**# 6) Manage multi-season selection, using genomic selection when feasible to identify the desired genotypes more precisely and to accelerate selection.**

**Key Actions:**

1. Cost Study. Are there alternative screening methods? What are their costs? Do they require new environments?

2. Validate in the full breeding program results of the initial heritability / genetic correlation study.

3. Interdisciplinary validation study with actors of the value chain. Does the trait measured on station correlate with the trait measured on farms? A gender-responsive approach would involve participatory evaluation with both genders and validation of the resulting variety candidates in terms of how they incorporate the gender trait. The metric of improvement may be different as translated by the social scientist than breeders are accustomed to. For example, improvement might be couched in terms of labor savings rather than in terms of ease of peeling score.

4. Develop a breeding strategy. The product profile is not synonymous with a breeding strategy. When in the pipeline will the new trait be selected for? Is early selection using prediction (i.e., genomic selection) or minimal phenotyping feasible? Does the cost of evaluation require late stage phenotyping when fewer selection candidates are still in the pipeline? Does new variation need to be brought in from outside the current breeding population? Do we put “breeder traits” (yield, disease resistance) into genotypes that have the gender traits, or do we try to bring gender traits into “elite” genotypes?
Breeding strategy definition:
A breeding strategy includes decisions about the means of creating or sourcing variability and how many different genotypes will be used.

Output: a new breeding strategy and a plan for ongoing validation of that strategy.

Outcome: varieties with the new gender trait or a mechanism to get that trait through management.

Group 7: Integrate gender responsive elements across the entire product management process as relevant

Participants: Bela Teeken, Jacob van Etten, Graham Thiele, Chiedozie Egesi, Peter Kulakow

1. The gender-responsive elements should be overlaid onto a best-practice product management process. The Stage-Gate process lacks the dissemination phase, so it needs to be combined with other existing product management processes. Also, the first decision about target environment and customer segments is lacking.
2. To change behaviors, we need to develop strategic, evidence-based communication pitch around the efficiency gains and adoption increase from a gender-responsive client orientation. To build this evidence, we can document what happens when gender and socially differentiated user preferences are ignored (cases of failure, for example, RTB crops and ignorance of quality traits).

   a. Using current varieties as a control. This will give early evidence if progress is being made. The control variety for gender-responsive breeding does not need to be high-yielding one, but one that has broad adoption or is acceptable to certain groups.

   b. Targeting more different target environments can be analyzed economically (Anicchiario). The same thing could be done for customer segments for the consumption dimensions.

   c. Failing early and cheaper, crisp decisions based on data. Formal way to use the socio-economic data to make these decisions.

3. It is critical to foster ownership by the multidisciplinary team of user-orientation including gender. Having a voice at the table of the gender researcher – social scientist)

4. Make user information available at each decision point with strong feedback loops.
5.2 **APPENDIX 2: WORKSHOP AGENDA**

**Thursday October 5th, 2017**

<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
<th>Presenter</th>
</tr>
</thead>
<tbody>
<tr>
<td>08.30</td>
<td>Welcome from Workshop Organizing Committee</td>
<td>Stefania Grando</td>
</tr>
<tr>
<td>08.40</td>
<td>Background and goals of workshop. Introductions, working agreements.</td>
<td>Graham Thiele Sue Canney</td>
</tr>
<tr>
<td>09.15</td>
<td>Design Elements for Gender-Responsive Breeding – setting the stage</td>
<td>Jacqui Ashby</td>
</tr>
<tr>
<td>09.45</td>
<td>Buzz groups and rapid feedback – three breakthrough innovations</td>
<td>Groups</td>
</tr>
<tr>
<td>10.15</td>
<td>Break</td>
<td></td>
</tr>
<tr>
<td>10.35</td>
<td>Gender research: introduce post-doctoral fellows and update on progress</td>
<td>Juliet Kariuki</td>
</tr>
<tr>
<td>10.45</td>
<td>Gender and social targeting (30 + 15Q&amp;A)</td>
<td>Alistair Orr &amp; Cindy Cox</td>
</tr>
<tr>
<td>11.30</td>
<td>Small group reflection on gender and social targeting</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• How can this be incorporated into a gender responsive breeding program?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Entry points and challenges</td>
<td></td>
</tr>
<tr>
<td>12.30</td>
<td>Plenary group think capturing inspirations, gaps, innovations</td>
<td></td>
</tr>
<tr>
<td>13.00</td>
<td>Lunch (side meeting WOC and PDFs)</td>
<td></td>
</tr>
<tr>
<td>14.00</td>
<td>Setting breeding objectives and trait prioritization</td>
<td>Michel Ragot</td>
</tr>
<tr>
<td></td>
<td>Lessons learned from implementation (30 +15Q&amp;A)</td>
<td></td>
</tr>
<tr>
<td>14.45</td>
<td>Small group reflection: operationalizing breeding objectives and trait prioritization with a gender lens</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• How can this be incorporated into a gender responsive breeding program?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Entry points and challenges</td>
<td></td>
</tr>
<tr>
<td>15.30</td>
<td>Break</td>
<td></td>
</tr>
<tr>
<td>15.45</td>
<td>Feedback and discussion on boards</td>
<td></td>
</tr>
<tr>
<td>16.30</td>
<td>Collective reflection: progress on gender design principles and potential roadblocks</td>
<td>Jacqui</td>
</tr>
<tr>
<td>17.00</td>
<td>Close for day</td>
<td></td>
</tr>
<tr>
<td>19.00</td>
<td>Dinner</td>
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</table>
**Friday October 6th**

<table>
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<tr>
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<th>Topic</th>
<th>Presenter/Facilitator</th>
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<tbody>
<tr>
<td>13</td>
<td>08.30 Review of Day one, outline of Day two</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>08.45 Synthesis of Case study lessons (30 +15Q&amp;A)</td>
<td>Stefania &amp; Hale Tufan</td>
</tr>
<tr>
<td>15</td>
<td>09.30 Small group work</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Lessons learned for a gender responsive breeding program?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Entry points, gaps and challenges</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>10.15 Feedback from groups</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>10.45 Group photo and break</td>
<td>Holly</td>
</tr>
<tr>
<td>17</td>
<td>11.00 Introduction to World Café and speed presentations Round 1</td>
<td>Sue and Holly</td>
</tr>
<tr>
<td>18</td>
<td>11.15 Round 1: approaches</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>12.45 Lunch</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>13.45 Speed presentations Round 2</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>14.00 Round 2: tools</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>15.15 Coffee break</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>15.45 Map the tools and approaches onto the breeding cycle</td>
<td>Jacqui</td>
</tr>
<tr>
<td>22</td>
<td>16.15 Topic working groups. Collective feedback and developing design principles</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>17.45 Close for day</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>19.30 Dinner – cultural evening and dance party</td>
<td></td>
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</tbody>
</table>
## Saturday October 7th

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<tr>
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<th>Presenter/Facilitator</th>
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<tbody>
<tr>
<td>08.30</td>
<td>Review of Day Two and further refining the design principles</td>
<td>Sue</td>
</tr>
<tr>
<td>09.30</td>
<td>Introduction</td>
<td>Jacqui</td>
</tr>
<tr>
<td>1.</td>
<td>Design principles for gender responsive breeding including competencies and communication plan</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Uptake pathway for GBI outputs and community of practice</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Fund raising strategy and design ideas for a three-year initiative</td>
<td></td>
</tr>
<tr>
<td>10.00</td>
<td>Working groups on above</td>
<td></td>
</tr>
<tr>
<td>10.45</td>
<td>Break</td>
<td></td>
</tr>
<tr>
<td>11.15</td>
<td>Working groups continued</td>
<td></td>
</tr>
<tr>
<td>13.00</td>
<td>Lunch</td>
<td></td>
</tr>
<tr>
<td>14.00</td>
<td>Feedback from working groups and collective reflection</td>
<td></td>
</tr>
<tr>
<td>15.00</td>
<td>Action plan and time lines of the way forward</td>
<td>Sue</td>
</tr>
<tr>
<td>15.30</td>
<td>Workshop close and inspirational thoughts</td>
<td>Three participants and Graham</td>
</tr>
<tr>
<td>16:30-18:00</td>
<td>WOC members with PDFs: collective study framework design</td>
<td></td>
</tr>
</tbody>
</table>
### 5.3 Appendix 3: Workshop Participants

<table>
<thead>
<tr>
<th>No.</th>
<th>Name</th>
<th>Institution</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Alessandra Galie</td>
<td>ILRI</td>
<td><a href="mailto:A.Galie@cgiar.org">A.Galie@cgiar.org</a></td>
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<tr>
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<td>Alastair Orr</td>
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<td>3</td>
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</tr>
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<td>11</td>
<td>Gabrielle Persley</td>
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<tr>
<td>12</td>
<td>Graham Thiele</td>
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</tr>
<tr>
<td>13</td>
<td>Hale Ann Tufan</td>
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</tr>
<tr>
<td>14</td>
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</tr>
<tr>
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<tr>
<td>17</td>
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</tr>
<tr>
<td>18</td>
<td>Jean-Luc Jannink</td>
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</tr>
<tr>
<td>19</td>
<td>Jemimah Njuki</td>
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<td><a href="mailto:injuki@idrc.ca">injuki@idrc.ca</a></td>
</tr>
<tr>
<td>20</td>
<td>Juliet Kariuki</td>
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</tr>
<tr>
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<td>Kayte Meola</td>
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<tr>
<td>22</td>
<td>Lora Forsythe</td>
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</tr>
<tr>
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<tr>
<td>24</td>
<td>Michel Ragot</td>
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<tr>
<td>26</td>
<td>Peter Kulakow</td>
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<td>27</td>
<td>Prakash Gangashetty</td>
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</tr>
<tr>
<td>No.</td>
<td>Name</td>
<td>Institution</td>
<td>Email</td>
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</tr>
<tr>
<td>28</td>
<td>Pricilla Marimo</td>
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<td><a href="mailto:p.marimo@cgiar.org">p.marimo@cgiar.org</a></td>
</tr>
<tr>
<td>29</td>
<td>Ranjitha Puskur</td>
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</tr>
<tr>
<td>30</td>
<td>Rhiannon Pyburn</td>
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</tr>
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<td>31</td>
<td>Rosemary Murori</td>
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<tr>
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<td>Seamus Murphy</td>
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<tr>
<td>34</td>
<td>Stefania Grando</td>
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<tr>
<td>35</td>
<td>Sue Canney Davison</td>
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<tr>
<td>36</td>
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<td>37</td>
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<td>39</td>
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<tr>
<td>40</td>
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</tr>
<tr>
<td>41</td>
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</tr>
</tbody>
</table>
5.4 **APPENDIX 4: WORLD CAFÉ GUIDELINES AND POSTERS**

**Background**

The World Café is an interactive space for workshop participants to share and discuss approaches and tools relevant to gender responsive breeding. These may be under development or already in use, but must be of relevance to other practitioners. The World Café will take place on October 6th as an integral part of the workshop. It provides an opportunity for the refinement of the tool or approach presented and for critical thinking around how this can be applied by breeding programs and at what stage in the program - mapped against the diagram below.

An inventory of the presented approaches and tools will be made available as a resource on the Initiative website, and will contribute to the guidelines for gender responsive breeding.

![Diagram of Main stages of a breeding program](image)

Main stages of a breeding program
Timeline for submission

1) September 01 – Participants are invited to send ideas for presentation as posters either on approaches or tools to Zandra Vasquez at z.vasquez@cgiar.org

2) September 12 – WoC lets participants know if their idea has been selected for presentation

3) September 25 – Participants send PDF of poster to Zandra Vasquez

Process for World Café

The session will be divided into two blocks of different topics, each of which will contain five unique posters.

The session will begin with a series of speed presentations in plenary format in which each poster author delivers a one-minute ‘pitch’ for their poster using one PowerPoint slide. This provides an opportunity for participants to decide which posters they are interested in viewing.

Following the speed presentations participants will have one hour to visit three posters of their choice, spending 20 minutes at each poster in a group discussion with the poster author. All participants will rotate to their next poster of choice at the same time.

The poster author will remain with their poster for the duration of the block to lead the conversation with visiting participants. Poster authors have three minutes to explain their poster when a new group arrives, leaving the remaining time to address questions from the participants. Participants will leave feedback on a board by each poster addressing the following questions:

1) What’s really good about this approach/tool?
2) What needs to be improved to make it more usable?
3) Where does it fit in the breeding stages cycle?
4) How can it be linked to or built into the draft guidelines for gender responsive breeding?

The two blocks and their themes are:

Block 1: Tools relevant to gender and breeding

Block 2: Approaches relevant to gender and breeding

The poster session in each block will be followed by a 20-minute discussion session led by the facilitator.
Requirements

Poster presenters will be required to bring:

1) A poster for discussing the tool or approach

2) One PowerPoint slide as the basis for a one-minute speed pitch.

Presenters are responsible for developing and printing their materials.

Poster specifications

The recommended poster size is A0 (33.1 in x 46.8 in) and can be designed using a template that will be provided on September 12th to authors of accepted submissions.

The posters that were presented during the World Café are included in the following pages, each one followed by a summary of feedback from workshop participants.
Poster 1.1: Market-led approaches to new variety design

The Business of Plant Breeding
Market-led approaches to new variety design

Three principles drive success in demand-led breeding:
1. Target driven
2. Demand-led variety development strategy
3. Performance indicators to measure new variety adoption by farmers and their value chains.

Some core best practices in demand-led breeding...

- Demand-led plant breeding (DLB) combines best practices in market-led, new variety design with innovative plant breeding methods.
- DLB puts more emphasis on understanding the preferences of clients and their value chains rather than just promoting what new technology can offer (Figure 1).
- DLB delivers new varieties that meet the needs of farmers, consumers and processors for local, regional and export markets.

Education module
- State-of-the-art concepts and best practices in DLB have been compiled by experts and educators from the public and private sectors across Africa and internationally.
- A training manual and education module are available, covering:
  1. Principles of demand-led variety design
  2. Visioning and foresight to set breeding goals
  3. Understanding clients' needs
  4. New variety design
  5. Variety development strategy
  6. Monitoring, evaluation and learning
  7. Business cases for new variety development

More information
Education co-ordinator: Professor Pangiri Yongona (pangonona@waccie.edu.gh), West Africa Centre for Crop Improvement, University of Ghana. Dr Nasir Yaqoob (nyaqo@cgiar.org) BECA-IIRR Hub, Nairobi, Kenya and Professor Shmuel Amsellem (ShmuelAmsellem.ac.za) at the African Centre for Crop Improvement, University of KwaZulu-Natal, South Africa; www.syngentafoundation.org/demand-driven-plant-variety-design.

Acknowledgements
Demand-led Plant Variety Design for Emerging Markets in Africa is supported by the Alliance for Agricultural R&D for Food Security (Syngenta Foundation for Sustainable Agriculture, Australian Centre for International Agricultural Research and the Crawford Fund). The project is administered by the Global Change Institute, University of Queensland, Australia.
Feedback on Poster 1.1 from Workshop Participants

The document is timely and excellent tool to improve breeding and create impact

The participants found all the chapters very interesting especially chapters 2, 6 and 7. These chapters build foundation for responsive/demand-led breeding.

Some of the issues raised included:

1) How gender responsive breeding is addressed in the book?

2) How poor /marginal farmers will benefit from the breeding products - if market is the driver

3) The process to prioritize traits and how it is done in practical way?

4) How to balance the technological supply /driven to the demand pull

5) There were a lot of interest in the approach and book - several participants demanded the cost of book and where to get copies?

Most of these issues were discussed/addressed using PABRA/beans experiences (http://www.pabra-africa.org/)

Suggestions to improve the document

There were good suggestions on what to add/how improve the book content (which also is planned) such as preparation and production of the very short duration courses for the policy makers and donors, produce E -learning, good interest on market as driver of breeding. Every participant appreciated the immediate use of the book since the universities and CG are owning the document/processes, mainstreaming its use will be easier!
Experience and guidelines for PVS: Integrating gender and potato breeding

Background
Participatory research involving both men and women is increasingly being used as a way to promote adoption and upscaling of technologies. Excluding farmers from decision making regarding varieties is blamed for the low adoption rate of released varieties. This is because researchers or breeder criteria may overlook certain growers, market and end users preferences. Adoption of varieties may increase if farmer and consumer preferences are known and taken care of during breeding. As a result of different roles and different access to resources, men and women may also have different trait preferences. Thus it is also important to understand any similarities and differences between men and women's preferences so these can be taken into account during breeding to ensure that they both benefit.

Methods: Integrating gender
Identification and ranking of selection criteria

<table>
<thead>
<tr>
<th>Breeders</th>
<th>Score (of women farmers)</th>
<th>Score (of men farmers)</th>
<th>Rank</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Yld</td>
<td>68</td>
<td>15</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>Free from pests/disease</td>
<td>12</td>
<td>12</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Good taste</td>
<td>10</td>
<td>10</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Stability</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Colour</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Early maturity</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>15</td>
</tr>
</tbody>
</table>

Ranking criteria selected by men and women in separate groups in Amhara Ethiopia

- Involve equal numbers of men and women to participate in the evaluation exercise.
- A sex disaggregated analysis will not make much sense if very few men compared to women or very few women compared to men participate.
- Invite participants from different socio-economic categories to evaluate clones.
- Depending on the community, you may need to ask women to evaluate first before men to avoid women being influenced or pressured to select certain varieties.
- Separate farmers into their sex groups for the evaluation to ensure that both men and women's voices are heard.
- When farmers are hosting demonstration plots, recruit both male and female farmers to host demonstration sites because men and women have different resources (including quality of land and inputs) so may prefer different traits.
- Farmers may wish to associate with / ask questions from some sex farmers.

What happens when a woman and a man from a male-headed household have conflicts in selection of varieties?
One of the goals of PVS is to provide farmers with a basket of choices. Care must be taken to be clear that it is not possible to provide each and every man and woman their own choices. The aim is to select varieties that are more commonly preferred in the community. If there is clear preference variation for men and women for particular variety in a community then we should look for options making available the preferred variety by both parties in a community. By doing this PVS can contribute to restore or increase on-farm diversity of germplasms in a particular community.

Limitations
- Collecting statistical information will not be able to answer why varieties are preferred by men or by women. This needs to be accompanied by qualitative data collection.
- Farmers may not have knowledge of how pests and disease present so they may choose susceptible clones. There may be need for trained farmer panels who are able to identify problem areas while also selecting for traits that are preferred in communities.
- Not possible to conduct phenological tests with many clones because farmers may suffer from fatigue and over sensory stimulation. However for visual selection its possible evaluate more clones. Breeders can also consider data collected in previous selection PVS activities.

Activities: Evaluation stages

1. Segregation development
2. Harvest
3. Seed increasing
4. Post harvest 45 days and 90 days
5. Harvesting
6. Evaluation and ranking selection
7. Selection
8. Poster presentation
9. Selection
10. Ranking selection criteria

Feedback on Poster 1.2 from Workshop Participants

- Selecting of participating farmers: Make sure they represent the population of future adopted
- Consult published and established protocols on tasting panels to prevent fatigue among participating testers
  - Checkout handbook ‘Evaluating Technology with Farmers’ on CIAT’s website for methods to evaluate lots of materials without causing fatigue
  - Consult handouts on organoleptic tests conducted by researchers working in the vegetable sector
  - You can allocate different people to test different clones instead of all of them testing all the clones
- Consider using ratings instead of rankings
- Ask why farmers select clones when they still have the answers in their heads on the day of evaluation. This was done in the Ethiopia example but not integrated in the tool
- What is the cost of sensory evaluations? It can be expensive if you have a lot of material and need to do several selection rounds
- There is need for other support tools such as surveys to validate some of the findings
- Need to clarify some of the preferred traits when farmers are free listing to ensure that they are properly captured (e.g. what does good cooking quality?)
- A good thing is that objective data on yield, disease etc was collected so can compare if farmer listed traits are matching with what they selected.
Poster 1.3: The Women’s Empowerment in Livestock Index (WELI)

The women’s empowerment in livestock index (WELI)

Relevance in breeding cycle

The introduction of new livestock breeds in a household can result in shifts in labor allocation, and in control over livestock and its products. These changes may increase the benefits for some household members only while adding to the workload of others ultimately affecting the adoption of new breeds or the impact of an intervention. Understanding gender dynamics affecting who are the actual “doers” in livestock activities and breeding in particular, gendered constraints and opportunities, and access to benefits helps to develop breeds that respond to the needs of the whole household. The WELI was created to assess the empowerment of women involved in livestock systems. Its focus on gender roles in key activities of livestock management and breeding, and on the related decision-making helps shape a breeding program in a gender responsive manner. It also helps assess the outcomes of a breeding initiative on the empowerment of women livestock keepers.

Description of stages

The WELI is a survey tool to be administered to individual women and men livestock keepers. It provides an overview of gendered activities and decision-making in the farm with a particular focus on livestock-related activities: animal breeding, feeding, health, cleaning, food preparation, and crop cultivation and off-farm employment. Quantitative analysis helps assess the empowerment of individual livestock keepers through key dimensions of empowerment and in relation to livestock (Fig 1).

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Decisions about agricultural production</td>
<td>a. Input into production decision</td>
</tr>
<tr>
<td></td>
<td>b. Autonomy in production</td>
</tr>
<tr>
<td>2. Decisions related to nutrition</td>
<td>a. Input into nutrition decision</td>
</tr>
<tr>
<td></td>
<td>b. Autonomy in nutrition</td>
</tr>
<tr>
<td>3. Access to and control over resources</td>
<td>a. Access to decision (food, livestock, products)</td>
</tr>
<tr>
<td></td>
<td>b. Ownership and control of land and crop assets</td>
</tr>
<tr>
<td>4. Control and use of income</td>
<td>a. Control over farm income</td>
</tr>
<tr>
<td></td>
<td>b. Control over off-farm income</td>
</tr>
<tr>
<td></td>
<td>c. Control over expenses</td>
</tr>
<tr>
<td>5. Access to and control of opportunities</td>
<td>a. Access to markets</td>
</tr>
<tr>
<td></td>
<td>b. Access to non-farm income opportunities</td>
</tr>
<tr>
<td></td>
<td>c. Access to training, information, groups</td>
</tr>
<tr>
<td>6. Extent and control of work time</td>
<td>a. Total workload</td>
</tr>
<tr>
<td></td>
<td>b. Proportion of revenue generating workload</td>
</tr>
<tr>
<td></td>
<td>c. Control over own time</td>
</tr>
</tbody>
</table>

Fig 1. Dimensions of empowerment included in the WELI

Example of use

The WELI has been developed based on formative and qualitative research in selected sites in Tanzania where the tool was also implemented in 2015 with 373 women. The information produced by the index helped livestock scientists identify key decision-makers and doers in breeding activities to improve the targeting of breeding programs. In conjunction with a nutrition survey the tool was used to assess whether women’s empowerment through livestock enhances household food security.

Fig 2. Empowering women through poultry breeding

Next steps in developing tool

Repeat use of the tool in the context of a livestock breeding intervention can provide longitudinal data to assess impact on various dimensions of empowerment (Fig 3). Such knowledge can help improve livestock breeding interventions to ensure the relevance of newly developed breeds for all household members and the equity of their outcomes.

Fig 3. WELI results on dimensions of empowerment by district

Partners:

Poster authors: Alessandra Galé, ILRI
Contact: a.gale@cgiar.org
Feedback on Poster 1.3 from Workshop Participants

Generally, the tool was well-received. Many appreciated the combination of qualitative and quantitative approaches included in the tool. Some questions on larger implications of findings could not be answered because the tool was only piloted up until now and not used extensively yet.

One comment received related to the fact that the index does not capture collaboration between household members and shared ambitions. Such an issue is addressed through qualitative research that the tool’s authors recommend being done to complement the index.

A number of questions related to how the WELI relates to the WEAI tool (which was the basis for the WELI creation). The differences were clarified together with the circumstances when using the WELI is most appropriate:

- The tool is best used to conduct a baseline assessment of gender issues in livestock breeding or development – given the level of detail in labor sharing and decision-making it provides for specific livestock activities.
- The WELI is also best used to assess the impact of a program on women’s empowerment through livestock.
Poster 1.4: “Food Yield”: Identifying essential issues for breeding

From Harvest to Food

<table>
<thead>
<tr>
<th>Harvest</th>
<th>Potential Criteria for Selection and Variety Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Threshing</td>
<td>Ease of threshing</td>
</tr>
<tr>
<td>Storage</td>
<td>Threshing losses</td>
</tr>
<tr>
<td></td>
<td>Storage losses</td>
</tr>
<tr>
<td>Grain (kg/ha)</td>
<td>Grain health (aflatoxin)</td>
</tr>
<tr>
<td>Cleaning</td>
<td>Dehulling/decorication losses</td>
</tr>
<tr>
<td>Processing</td>
<td>Useful components</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Flour/Grits (% losses)</td>
<td></td>
</tr>
<tr>
<td>Cooking</td>
<td>Cooking time</td>
</tr>
<tr>
<td>Preserving</td>
<td>Water uptake and swelling</td>
</tr>
<tr>
<td></td>
<td>Combinations with other foods</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Food - Family meal (kg grain/person/day)</td>
<td>Taste</td>
</tr>
<tr>
<td></td>
<td>Color</td>
</tr>
<tr>
<td></td>
<td>Consistency – over time</td>
</tr>
</tbody>
</table>

Authors: Eva Weltring, Krista Isaacs, Mamourou Sidibé, Vera Lugutuah, Salimata Sidibe, Bocar Diallo, Abdoulaye Diallo, Baloua Nebie, Aboubacar Toure and Fred Rattunde
Comments by Author: Eva Weltzien

The purpose of presenting the concept of food yield as a tool for gender responsive breeding is that in most cultures many of the post-harvest steps, processes, responsibilities rest with women, especially in the context of crops that are grown for home consumption.

The main purpose is to actually express yield not just as the total product harvested, but as the total amount food produced with it. Sorghum farmer in Mali expressed it also as the quantity of grain they need to on a daily basis to feed their family.

A range of factors contribute to this. For variety adoption, it is essential that producers/consumers can prepare more food from their field efforts, when growing a anew variety. Thus, any losses of dry matter during the grain/roots/fruit processing needs to be kept to a minimum. Storability of grain is critical, so that food security is assured for the whole year season.

Thinking through the steps, and relating it to women’s specific responsibilities will results in the identification of traits that are important. Breeders can then work on these traits to identify opportunities for testing and genetic improvement options.

<table>
<thead>
<tr>
<th>Women’s responsibility?</th>
<th>Traits to consider</th>
</tr>
</thead>
<tbody>
<tr>
<td>Threshing</td>
<td>Ease of threshing; resistance to grain mold; glume color; value of chaff</td>
</tr>
<tr>
<td>Grain storage</td>
<td>Storability; resistance to weevils</td>
</tr>
<tr>
<td>Dehulling/decortication</td>
<td>Ease of dehulling; losses during decortication; color of dehulled grain</td>
</tr>
<tr>
<td>Milling/pounding</td>
<td>Ease of milling; ratio of flour to grits</td>
</tr>
<tr>
<td>Cooking</td>
<td>Ease of preparation; water requirements</td>
</tr>
<tr>
<td>Taste</td>
<td>Consistency over time; texture; color</td>
</tr>
</tbody>
</table>

Discussions with participants raised the following points:

The stage at which this tool is used: The concept itself is used in the priority setting process, initially to understand which trait could be important, and then to discuss relative importance with concerned stakeholders/actors. The methods that we developed for sorghum for evaluating the related traits in detail are used during the variety evaluation stage, when varieties enter into the first stage of multi-location testing. Based on the experiences with the procedure, which includes visual evaluation of the grains, before the processing starts, the
breeders now invite some women to the research station to evaluate grain samples of lines in the early stages of a selection program visually for the acceptability of the grain quality.

A major consequence for the selection strategy for the West-Africa sorghum breeding program was to change the basic germplasm from using the sorghum races that are used for genetic improvement in the US, Australia and India, to the sorghum race most widely cultivated in West-Africa, the Guinea race. With this step, the breeders can be sure that most of the traits required for grain quality and food yield in general are already ‘reached’ and genetic improvement can focus on productivity, which had never been targeted in this race by any breeding program before.

The scale of the relevance of these issues around food yield, as well as the specific traits identified for sorghum in West Africa, is actually showing to be widely applicable to areas, where the stiff porridge called ‘to’ in Mali is consumed. Many of the traits are also being mentioned in studies on adoption, or trying to understand non-adoption of other crops in other regions, i.e. an indication that issues of ‘food yield’ are critical for farmers, and others concerned with food security of their families. The responses from the group confirmed that the concept can be applied also beyond cereal grain crops.

There was some discussion of the methods the sorghum breeding program has used and is using to identify the varieties that are evaluated for their processing and culinary traits, and the gender responsiveness of these tools. They are described in the case study book chapter.

The details of the culinary test methodology and the underlying concept of food yield are being published, with some details also in the case study book.
Poster 1.5: Social and Gender targeting (there was no actual poster prepared as this discussion was a last-minute request)

Cindy Cox

- LSMS-ISA surveys – while only available for 8 countries (not enough!) – are data-rich in terms of crop and plot-specific data, as well as capturing individual information in terms of cropping activities (and livestock, fish) at farm level (gender!). Great for targeting farmers.

- DHS survey data are large and comprehensive, covering dozens of countries and are an excellent resource for health and nutrition data on women and children. Great for targeting consumers.

- There are always missing variables of interest with every dataset (e.g., country, crop, etc.)

- Always be skeptical – gauge the sampling framework, methodology, sample size, geographical extent, and data quality, as well as realizing the limitations of the dataset.

- Data are not an end-all – does not take the place of local knowledge and expert validation. Beware of ‘data dredging’ (look it up on Wikipedia). Must realize the objectives in data collecting (e.g., policy framework, etc.).

- Data often beget other data – linking between datasets is important! Plugging data together requires open datasets. Set your data free so other users can take it places you might not imagine (e.g., Dataverse is an excellent data sharing platform and never dies like with an expired URL. It’s like a data library and you are more likely to get your work cited if open – other data are available from platforms like World Bank, Data.gov, etc.).

- Applying a prioritization or targeting framework is very difficult without subnational, mappable datasets to capture the enormous heterogeneity across landscapes.

- What about Asia? Totally underrepresented in many of these large datasets.

- Can these data be used to identify the scale of a locally identified preference?

- What kind of big data are available to capture gender dynamics along value chains?
Poster 2.1: Intersectional gender tool focusing on task groups

Intersectional gender tool focusing on task groups

Relevance, where it fits in breeding cycle

Sex-disaggregated data collection protocols on variety preferences are problematic as they put upfront sex and gender-differences as an explanatory factor. This type of data renders invisible how gender roles are articulated by the intersections of locally defined identities, such as occupational tasks, immigrant or ‘local’, ethnic/language group, age group and economic status. So instead of segregating by sex groups this tool proposes an identification of task groups: Who does what?

This task group approach overcomes the intersectionality of local identities by focusing on who does what along the value-chain and allows for a closer integration with the practice of participatory trials, post-harvest processing, and breeding as these connect to specific tasks.

People can simultaneously belong to different task groups and the extent to which they belong to one and not another and the extent to which certain tasks are done by women and men are informative about gender roles and norms and current possibilities and developments within farming, processing and selling.

This makes this tool fit in the ‘social targeting and demand analysis’ stage but could also be suitable within participatory breeding strategies (generation/identification of new varieties).

Example of use

In Osun state Nigeria we are evaluating improved and farmer varieties with a particular task group that has experience in cultivation as well as processing of cassava to know their variety preferences with regards to food quality. This group is responsible for a major part of gari production, a major cassava product in Nigeria. Given that mostly women do the processing we ended up with the identification of mainly women participants. Their husbands were also taken along as they often work together or share similar work on the farm with their wives as well as to study the intra household power relations and decision making.

The region of study has several immigrant groups that are dependent on locals for access to land. They use similar operations to cultivate, process and sell cassava but the scale of the enterprises differ: Women and men sell fresh cassara while mostly women sell processed cassava. By studying the preferences of each task group within each social group, we insured that all (vulnerable) groups were included in evaluating for preferences. This can inform breeders on how to make a suitable composite of the preferences to inform their breeding practices.

Description of steps or stages

• Identify how a community defines its different social groups through focus group discussions and discussions with key informants, transit walks and period of immersion in the community.

• Identify who does what in relation to the production, processing and consumption/sale of the variety and its products and identify respondents/participants representing the task or combination of tasks that you are interested in (crop/animal dependent) without using sex as criteria of selection. This should be done by assuring the respondent/participant indeed has detailed knowledge on the tasks that the has indicated to master (probe with jargon, or catch on the job)

• Include participants from each social group and different age group and sex categories if they exist.

• Find out how gender is articulated by combining the participatory activities with gender research on positionality (interviews and observation of the roles taken up by the respondents/participants within the activity).

Next steps in developing tool/approach

The tool is currently launched within the cassava breeding unit of IITA, Ibadan Nigeria. First results will inform us in what way the tool will have to be adjusted. The cooperation between social science and gender specialists, food scientist and breeders is crucial to move away from the simplistic upfront disaggregation of data by sex as well as the reliance on mere social science tools.

Trials with farmers and other participatory methods including in-village food science exercises should become tools of action research within a social science investigation for a truly integrated approach to link breeding objectives to gender.


Posters and authors team: Béla Teeken, Hale Tufan, Peter Kulakow, Chediozie Egesi, Tassy Madu, Ugo Chijoke, Olamide Olaosebikan, Abolore Bello, Amare Tegbaru, Krista Isacss, Seamus Murphy, Peter Ileubey, Owoade Durodola, Olabisi Ogunaode, Maru Okoro, Joseph Onyeka.

Contact: Béla Teeken, b.teeken@cgiar.org
Feedback on Poster 2.1 from Workshop Participants

- The task groups as mentioned in the tool would better be called “task categories” as the people who perform a similar task are not necessarily a social group that interacts and operates together.

- Because of the explicit recommendation to not do an up-front sex disaggregation gave some people the impression that no sex disaggregation took place. This is however a misunderstanding. This sex-aggregation, however, is not the initial way to group. It is important to first define who does what within each local social category and then study gender relations within these task categories (groups). This is important to keep the link between variety preferences and the people with actual work experience on crop related tasks.

- Some people did not see how the complexity of intersecting categories related to variety preferences. However, others complimented the tool because it clearly focuses on this relation between variety preferences and social groups. The tool assures that the working conditions of those that directly work on production, processing or selling is addressed. These groups are directly affected by any change in variety traits.
“Poster” 2.2: GBI Workshop Glossary – a work in progress
5th October 2017

<table>
<thead>
<tr>
<th>Term</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agro-ecology</td>
<td>An agro-ecological Zone is a land resource mapping unit, defined in terms of climate, landform and soils, and/or land cover, and having a specific range of potentials and constraints for land use. (FAO definition)</td>
</tr>
<tr>
<td>Breeding objectives</td>
<td>The combination of traits and trait values sought for desired performance in different target market segments of a breeding program.</td>
</tr>
<tr>
<td>Breeding cycle</td>
<td>A stylized description of the main stages in breeding leading to the development and delivery of a breeding product.</td>
</tr>
<tr>
<td>Breeding products</td>
<td>Plant varieties or animal breeds resulting from the combination and selection of genetic resources, genes and traits of interest and made available as hybrids, lines, clones or populations with characteristic levels of diversity.</td>
</tr>
<tr>
<td>Breeding program</td>
<td>The planned breeding of a group of animals or plants, usually involving at least several individuals and extending over several generations.</td>
</tr>
<tr>
<td>(End) User</td>
<td>Individuals or organizations who use breeding products for food, feed, or energy. In some cases, growers can also be considered as users. A user (sometimes referred to as “end user”) may make use of a given breeding product through both market and non-market social relations. A population of users is the aggregate of people with common objective(s) for use of the product. For our purposes, this aggregate population is referred to as a market segment, even though not all users express their demand through formal markets and may be defined by the failure of formal markets to deliver the breeding products they need and want.</td>
</tr>
<tr>
<td>Gender design principles</td>
<td>A set of evidence-based principles which can be applied in the design and implementation of breeding programs to ensure they are gender-responsive</td>
</tr>
<tr>
<td>Gender-responsive breeding</td>
<td>Gender-responsive breeding should:</td>
</tr>
<tr>
<td></td>
<td>• <strong>Know</strong> when, where and why women and/or men are important and distinct groups of participants or beneficiaries. Take into account important differences in opportunities and constraints faced by women and men</td>
</tr>
</tbody>
</table>
that breeding can influence. Understand how gender dynamics and norms may affect preferences for breeding products and uptake.

- **Anticipate** how design decisions (e.g. plant ideotype and trait prioritization, targeting and testing varieties with users) may impact and be influenced by gender differences in availability of resources including labor and of future options

- **Design** breeding objectives specifically to address gender dynamics, to benefit women users when they are an important distinct beneficiary group and consider their needs, constraints and knowledge more generally in the breeding program to support technology uptake while also enhancing gender equitable outcomes of interventions.

- **Be accountable**, making sure success of the breeding program is measured in ways that include success for women as well as for households or users in general.

**Growers:** Individuals or organizations who grow plants or raise animals with the aim of harvesting or collecting one or more specific products (grain, whole plant, tubers, milk, meat, wool, etc.)

**Market segment** A geographic area or a group of people having a relatively homogeneous demand for a commodity (here crop varieties or animal breeds). For instance, a market segment may be corn growers planting very early maturing corn for ethanol in the US Midwest. Another segment may be corn growers planting late maturing corn for ethanol in the southern US. Yet another market segment may be farmers growing rice for self-consumption along the Senegal river. The population of users who make up a market segment may all be in a single agro-ecology or this population may be distributed across several different agro-ecologies. The extent to which an agro-ecology and a market segment coincide will depend on the extent to which user demand (preferences) for a breeding product are determined by climate, soils and land use constraints as distinct from other considerations, such as suitability for a certain type of processing, price, color, appearance, storability, etc.
<table>
<thead>
<tr>
<th>Term</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ontology</td>
<td>A set of standardized and precise descriptors related to an aspect of breeding which facilitates data exchange and compilation of data into larger databases.</td>
</tr>
<tr>
<td>Priority setting for trait selection</td>
<td>The process be it formal or informal through which breeding programs determine their selection and weighting of traits in setting breeding objectives.</td>
</tr>
<tr>
<td>Product profile</td>
<td>A set of targeted attributes which a new plant variety or animal breed is expected to meet to be released onto a market. Attributes must be understood as traits with a specific value, this value being defined either in absolute or relative terms. For instance, a product profile may list grain yield (11 tons/hectare or more), or tolerance to Downey mildew (same as or better than variety X), total oil content (no less than variety Y).</td>
</tr>
<tr>
<td>Product value chain actors</td>
<td>The individuals or organizations who take products harvested or collected by growers, possibly transform them (although not necessarily), and provide them to other users. In some cases, growers may also assume functions in the supply chain. Product value chain actors in some circumstances can be considered “users” and may also have preferences for traits</td>
</tr>
<tr>
<td>Task group</td>
<td>A group of people in a community who carry out similar tasks related to the work of production, processing, transportation and marketing (selling) of varieties or products made from varieties</td>
</tr>
<tr>
<td>Trait</td>
<td>A distinct variant of a phenotypic characteristic of an organism; it may be either inherited or determined environmentally, but typically occurs as a combination of the two. For example, eye color is a character of an organism, while blue, brown and hazel are traits.</td>
</tr>
</tbody>
</table>

Sources

Bill and Melinda Gates Foundation on gender responsive agricultural development:  
https://www.gatesfoundation.org/What-We-Do/Global-Development/Agricultural-Development/Creating-Gender-Responsive-Agricultural-Development-Programs

https://jvanderw.une.edu.au/BPDesignHG.pdf
Feedback on Poster 2.2 from Workshop Participants

What we liked

- Glossary absolutely needed and important. It’s very worthwhile as the GBI addresses a wide audience

What to improve

- Definition of product value chain: refer to “business actors” in VC who handle the harvested product
- Shorten definitions of user and market segment
- Breeding products include fish strains
- Breeding cycle includes delivery and use of product
- Task group: not really a social group rather a category
- Gender responsive breeding change “know” to “identify”

Add to glossary

1) Gender and gender analysis, sex disaggregation
2) Target beneficiaries as a subset of users who breeding program needs to ensure receives benefits, e.g., micronutrient deficient children
3) Priority setting for trait selection: includes selection and integration of traits, e.g., selection index
4) Selection index: the specific criterion which determines whether a breeding genotype is advanced or cut from the program
5) Intersectionality
Poster 2.3: 1000 minds – Economic weights for gendered traits

1000 minds- Economic Weights for Gendered Traits?

Relevance, where it fits in breeding cycle
1000 minds (https://www.1000minds.com/) is a decision making software with a wide range of uses, including plant and animal breeding. It has been used in cattle and sheep breeding, forage grasses and most recently on cassava. The novel use of a pair wise ranking method called PAPRIKA (Hansen and Omber, 2008), enables users to administer surveys to determine “weights” of each attribute of a product. The software has been used to set breeding priorities for a diversity of uses; setting economic values for traits in sheep breeding (Byrne et al. 2012), forages (Smith and Fennessy, 2014), as well as developing dairy farmer typologies (Martin-Collado et al., 2015 and Slagboom et al., 2016) and setting economic values for traits in the Australian dairy farming industry (Byrne et al., 2016). We are exploring the use of 1000 minds to develop economic weights for cassava breeding in Uganda, Tanzania and Nigeria, specifically to meet gender responsive and user oriented breeding targets.

Description of steps or stages

https://www.1000minds.com/

The 1000 minds choice experimentation survey design begins by defining the attributes, concepts and choices that will be presented in the survey. For breeding, attributes can be “traits” (yield, disease, protein/starch content etc) along with levels that are defined for each (kg yield, amount of disease, amount of protein/starch per animal/plant etc).

Example of use

In a 1000 minds design experiment, Uguchukwu Ikeogu tested the decision making tool for three cassava traits at three levels each. This test revealed the need for better understanding and definition of traits before developing the survey. Without clear definition and reference ranges for “good gari”, “big roots” and “matures early”, emerging as preferred cassava traits from open ended interviews and FGDS, it will be nearly impossible to use these for 1000 minds. Further work will need to be carried out to refine the tool before deploying with users.

Next steps in developing tool/approach

Adapting the 1000 minds method to gender responsive breeding will require detailed development work to define traits and ranges, as well as refine the interface for use in the field setting directly with cassava farmers, processors and consumers.

Points for World Café discussion:

1. How can the software be used “offline” and still give users an opportunity for direct input?
2. How can we define traits and ranges in a standardized manner- need for pre-survey focus groups?
3. What are considerations we should have in beta-testing to ensure the tool is user-friendly for example for women, young and illiterate respondents?
4. Can we adapt the tool to be more “gender responsive” beyond recording age, sex etc of respondent- what do we need to think about?

Partners

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Feedback on Poster 2.3 from Workshop Participants

The session on 1000 minds went very well. There was a lot of positive feedback on the potential for the tool, and many useful suggestions.

- Several people suggested the need for focus group discussions before the tool is applied to solidify the trait descriptors and ranges that would be used in the tool.
- A major positive was that this was a formal method to engage users in setting breeding priorities
- Another very useful suggestion was to create different surveys for different product profiles, so that we are not trying to capture all preferences at once.
- Several people mentioned the use of visual aids to help facilitate the conversation and offered references and further information from their experience.
- The selection of respondents was important, to make sure we select representative respondents from social groups that had been identified from baseline FGDs as processors of the chosen product the tool would be applied to.
- Traits that are used in choices must be independent—necessary for trade-off
- There is a need to bring data back to communities to reflect on and refine results
Poster 2.4: ClimMob, digital platform to support triadic comparisons of technologies (tricot)

Disrupting variety selection

ClimMob is a digital platform for massive participatory variety trials, following a crowdsourced citizen science approach we have called “triadic comparisons of technologies” (tricot).

A very simple format of farmer variety evaluation, ranking three varieties, makes it possible to involve many farmers.

The resulting information supports variety release, the creation of location-specific variety recommendations, and an analysis of unmet varietal needs.

Some of the advantages are that (1) we reduce costs and diffuse seeds massively while evaluating suitability; (2) we avoid “leadership effects” in choice data; and (3) we have sufficient statistical power to distinguish socio-economic and spatial effects on variety choice.

Example of use: Nicaragua

In Nicaragua, we have worked on bean variety selection with x farmers. Even though this was a relative small trial, the results show that seasonal climate conditions influence variety choice (see figure below). The results also allow us to recommend portfolios of two or more varieties that do well under different seasonal climate conditions, reducing production risk. Socioeconomic variables, including gender-related variables, did not show a strong influence on variety choice, showing these results are robust for different households.

Development

After initial pilots in 2013-2014, we have developed a digital platform, ClimMob, and we are producing evidence demonstrating the feasibility of the approach and impact on variety dynamics. At the same time, we are building partnerships for scaling in Central America, East Africa and South Asia, through bilateral projects, working with a broad array of crops. More than 15,000 farmers have participated in trials.

Next steps

We will gradually improve the digital platform. For example, a new version of ClimMob will use barcodes for seed packages and sophisticated ways to standardize data (for example, variety name). This will improve data quality and facilitate data aggregation over time and space, contributing to breaking the “glass ceiling” of farmer participation.

A main challenge we are addressing is to finance large-scale implementation through innovative business models. For example, in Honduras, our partner FIRAH is successfully selling tricot seed packages to farmers and exploring collaboration with local credit providers and farmer organizations. Also for other countries, we are exploring innovative business models around the tricot approach.

Partners

PRUEBA3

Visual explanation of steps involved in tricot

Analytical results from ClimMob (Placket-Luce model with recursive partitioning). Variety performance differs by seasonal climate.

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Feedback on Poster 2.4 from Workshop Participants

Card: “Dynamic approach with big data – want to learn more”

Comment: Great to have interest. A good start would be to read our paper in Experimental Agriculture (early online) on the tricot approach. There are other papers on some of the aspects of the approach and more is in the pipeline.


Card: “Selection bias in the inclusion of respondents should be avoided – maybe try cluster sampling or set up well-designed panels of farmers with partners”

Comment: We had some discussion about this. Some post hoc weighting of different clusters (derived from the data) based on representative data for the entire population may complement cluster/quota sampling.

Card: “Performance evaluation could have some elements of gender preferences.”

Comment: Data were sex-disaggregated, but a broader inclusion of gender aspects is needed. For example, we should include data about gendered control of production activities, processing, and income derived from sales.

Card: “Poster should be more explicit about sex-disaggregation – who got seeds?”

Comment: We have made an effort to include women in case their participation rates were initially low (in India). Also, see previous comments.

Card: “Not yet gender-responsive”

See comment on previous cards. The approach has much potential for being gender-responsive, given its “methodologically individualistic” approach, which will help to tease out gender-related aspects as well as how these aspects intersect/interact with other variables.

Card: “Would it work for root, tuber and banana crops?”

Comment: We have had discussions with banana and cassava researchers. Work on this is in the planning.

Card: “Gap in collecting reasons or traits behind preference – cross-check with free listing.”

Comment: Useful suggestion. We did not discuss this in the poster session, but this may be possible and necessary to implement in some cases. However, evaluation aspects are often formulated in a broad way to capture a range of factors (for example, marketability involves a
broad range of product characteristics). Also, to get to the why of farmer preferences, other approaches should complement the tricot approach, which is more focused on characterizing variation across large environments and populations. Other cross-checking approaches would be selective field visits and phone calls.

**Card:** “Can you implement for an earlier breeding stage than finished variety comparisons?”

**Comment:** Implementation in Ethiopia focused on landrace accessions of durum wheat. Work in Central America has included advanced lines as well as released varieties of common bean.
Poster 2.5: Multi-staged, gender-responsive analysis of “BOP” consumer demand

Multi-staged, gender-responsive analysis of ‘BOP’ consumer demand of different traits of the Abbassa G9 tilapia in Egypt

Relevance, where it fits in breeding cycle

Building on the Asia Fish Demand Model, WorldFish Egypt is implementing a purposively sampled 4-stage consumer survey for analyzing bottom of the pyramid demand of different traits of the Abbassa G9 tilapia strain. In turn, it aims to understand the impact of different fish products on Egypt’s growing problem of double-burden, mother-child malnutrition.

- This study design adopts gender-responsive approaches, which combine HHDD, WEE, & HAZ indices.
- This study design prioritizes qualitative approaches for assessing purchases, preparation & intra-hh allocation of food. This technique is complemented with GIS tools for addressing the key question of evident fish deserts in a fish rich country, as studies show both urban & rural consumers beyond the Delta experiencing fish shortages (Kastor and Kruijssen, 2014).

Description of steps or stages

In Egypt, the scaling strategy of the Abbassa breeding program is through bilateral projects that are implementing farm trials using different feed combinations and harvest cycles that address profitability constraints of small to medium scale farmers. Downstream recommendations for developing pro-poor supply chains require in-depth social targeting of resource-poor consumer markets. This calls for assessment of the nutritional outcomes of different fish products, which consider the dietary habits and gender dynamics across Egypt.

Example of use

Targeted assessment of consumer demand has identified strong market demand for smaller sized tilapia in Egypt (El Mahdi et al, 2015). Research has also indicated that consumption of smaller sized fish involves different nutritional outcomes for food-insecure households due to different gender relations and norms (Andersen et al., 2016; Thilsted, 2012). This emphasizes the need for mixed methods analysis of resource-poor consumers in Egypt. The following next steps are proposed.

Grade 1 to Grade 3 tilapia products (Jessica Bogard, WorldFish)

Next steps in developing tool/approach

Adopting the FAO 2016 and WorldFish 2016 guidelines, nutritional and WEE indexes are required to inform pro-poor breeding objectives in Egypt. Key questions in fish consumption research include:
- What do poor consumers buy, how much, at what price, where and when? Which pieces are eaten by different household members? (Feidler et al., 2016; Siebisubi, 2011)
- How are decisions being made between men and women around buying tilapia of different sizes of tilapia during peak and off-peak market seasons?
- What strategies are needed for promoting behavioral change that may lead to enhanced nutrient intake from fish among women and children in low income households?
- What are the likely trends of future demand for tilapia of different sizes in low income households in Egypt?

Partners

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Feedback on Poster 2.5 from Workshop Participants

- To contribute to/inform key question 3 of survey (recommendations for informing behavioral change in fish consumption among mothers and children), there is need to survey local parental perceptions of fish consumption habits relating to fish heads, fish eyes and specific fish pieces per different HH members. These can provide relevant communication strategies in the public domain for fish marketing campaigns. This is addressed only partially in stage 3 of survey, but needs more elaboration.

- HH food consumption analysis involves ‘1-month recall’, ‘7-day recall’ and ‘1-day recall for mothers and children specifically’. These are recommended FAO and WF guidelines. Suggestion to add ‘1-day observation method’. This will be logistically challenging, but may constitute a follow up study in 2018, which could lead to a methodological paper.

- The survey is purposively sampled, targeting resource-poor consumer market segment and ration card holders. Suggested that it be meaningful to break down sample of ration card holders, for example between expectant mothers, maternal mothers, heavily bread subsidized households, rural and urban (GIS already incorporated), those with fish farming household members and those without.
5.5 **APPENDIX 5: ANIMAL BREEDING CYCLE**

Example of considerations when designing an animal genetic improvement strategy:

1. **Breeding objectives**: white and black coat (= cross bred)
   - Livestock keeping objectives: savings and insurance
   - What does it really mean? E.g. high milk productivity?

2. **Trait selection criteria**: higher milk yields; same milk protein/fat + higher survival; higher reproduction

3. **Selection index**: Milk yields (Annual milk yields; protein/fat content) | Survival (age at death)
   - Reproduction (age at first delivery; calving interval; n. of calves per birth)
Key definitions:

- **A breeding objective** defines the 'ideal' animal a producer aims to breed and selection is the **method** by which the producer identifies that animal. Objectives (taken from the Australia Meat and Livestock Associated industry website)

- The **selection criteria** are the **traits that you measure** to provide data for animal selection (for improving the breeding objective): a **selection index** is how you combine information on these traits (you can weight one trait more heavily because it is, for example, more economically important, or easier to make genetic gains with due to higher heritability
The CGIAR Gender and Breeding Initiative brings together plant and animal breeders and social scientists to develop a strategy for gender-responsive breeding with supporting methods, tools and practices. The Initiative includes experts from across CGIAR centers and Research Programs, is coordinated by the CGIAR Research Program on Roots, Tubers and Bananas and the International Potato Center, and is supported by CGIAR Funders.