IITA-Gender Responsive Breeding Training Report

Genetic Resources Center, IITA-HQ, Ibadan (Nigeria)
21-23 September 2022

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Training program

21/09/2022

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8:30 - 9:00	Opening Remarks • Welcome from the training team • John Derera – *Head of Breeding (IITA)* • Leena Tripathi – *Director East Africa Hub (IITA)* online • Zainatou Sougrynoma Sore – *Head of Capacity Development (IITA)* • Hilde Koper – *Deputy Director General, Corporate Services (IITA)*	○ Team
9:00 - 9:30	Keynote Speakers • Chiedozie Egesi – *Cassava Breeder (NRCRI/IITA)* online • Peter Kulakow – *Cassava Breeder (IITA)* • Steven M. Cole – *Gender Specialist (IITA)* online	○ Team
9:30 - 10:00	Expectations from participants	○ Martina Cavicchioli ○ Millicent Liani ○ Olamide Deborah Olaosebikan
10:00 - 10:30	Gender concepts and awareness (I)	○ Martina Cavicchioli ○ Millicent Liani ○ Olamide Deborah Olaosebikan
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11:00-1:00	Who are we breeding for? Crop user segments	○ Béla Teeken ○ Martina Cavicchioli
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2:00-4:00	Gender concepts and awareness (II)	○ Martina Cavicchioli ○ Millicent Liani ○ Olamide Deborah Olaosebikan
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DAY 2

22/09/2022

Time	Topic	Session facilitators
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11:00-1:00	Current PVS and other user engagement practices. How to improve them?	○ Béla Teeken ○ Olamide Deborah Olaosebikan ○ Elizabeth Parkes ○ Bello Abolore
Lunch: 1:00-2:00		
2:00-4:00	Trait prioritization among users and social impact	○ Béla Teeken ○ Olamide Deborah Olaosebikan ○ Elizabeth Parkes ○ Bello Abolore
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DAY 3

23/09/2022

Time	Topic	Session facilitators
8:30-9:00	Feedback from day 2	○ Team
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12:30-1:00	Closing ceremony and delivery of certificates • Zainatou Sougrynoma Sore – *Head of Capacity Development* • John Derera – *Head of Breeding* • Training team	○ Team

Trainers' team

Trainers:

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Summary of the training

On September 21st, 2022, scientists from various African countries specializing in plant breeding for cassava, yam, cowpea, maize, soybean, and plantain were welcomed to the International Institute of Tropical Agriculture (IITA) in Ibadan for a three-day training on Gender Responsive Breeding. The primary goal of this training was to highlight the significance of gender and social inclusion in plant breeding research. The training provided an introduction on the definition and the application of gender- and social inclusion concepts to the breeding pipeline's design and implementation. It also enabled the trainees to recognize the relationship between gender issues and trait preferences, assess the social impact of breeding research activities, and, most importantly, to appreciate the benefits of working in an interdisciplinary team that combines biophysical and social scientists.

The use of interactive learning methods throughout the training allowed trainees to participate, voice their opinions, exchange ideas, and feel equally involved. Supported by in-person participation, such techniques were intended to allow participants to vividly notice and appreciate the growth of their knowledge in gender responsive breeding through an ongoing reflection of the notions and approaches learned in their everyday breeding work. In general, the training was well appreciated by the participants, many of which expressed interest in a follow-up. According to many participants, the richness of the content presented would have required devoting more time to the group exercises and discussions.

A short video documentary of the training with highlights from some of the participants is available at this link: https://www.youtube.com/watch?v=x9_Plq6WenA

Day one – 21 September 2022

Welcome and opening remarks

During the commencement of the training, **Martina Cavicchioli** welcomed all attendees. She stated that 11 of the 24 participants were from IITA, while 13 were from partner institutions, which, in her words, created an opportunity to foster collaborations with these partner institutions. She proceeded to introduce the other members of the training team who would participate in the three-day course and contribute their knowledge on gender responsive breeding. Cavicchioli expressed her gratitude for the programs and initiatives that had supported and sponsored the training session: the bilateral projects AfricaYam, AVISA, and NextGen Cassava, and the two OneCGIAR initiatives Accelerated Breeding (ABI) and Market Intelligence in Product Profiling (MIPPI). Cavicchioli concluded by emphasizing the critical importance of collaboration between plant breeders and gender and social scientists to achieve more transdisciplinary work. While enabling knowledge sharing from one discipline to the other, this will eventually allow both parties to collaborate towards the design of more gender and socially inclusive methodologies in breeding research. Cavicchioli continued by introducing the invited speakers to give some opening remarks.

John Derera, IITA Head of Breeding, underlined the development through time from "Traditional breeding" to "Breeding modernization." In a nutshell, he clarified that this transition importantly includes a focus on gender equality and the acknowledgement of diversity as a whole in order to better serve the demands of customers.

Leena Tripathi, East African Hub Director (IITA) and IITA Biotechnology Lead, welcomed the attendees and emphasized the value of including gender from the "start" of any research activity. In breeding research, this translates into adopting a gender-responsive approach, that is one that includes gender during the Customer and Product Profiling Stages. Such an approach is crucial to the integration of gender during the deployment stages of a variety. In return, integrating gender considerations in the breeding pipeline will increase chances for a greater varietal uptake.

Zainatou Sougrynoma Sore, Head of the Capacity Development Office at IITA, began by introducing her department's mission statement, which revolves around the pursuit of expertise through innovative programs that will enhance capacities in research for development while also delivering to transform African agriculture. She emphasized that, in accordance with the mission statement's briefing, the ongoing Gender Responsive Breeding Training fell under the category of "innovative programs." Sore also highlighted the emphasis put on gender inclusion in the workplace as a crosscutting theme across OneCGIAR initiatives. This should remind us that gender is a fundamental concern both within capacity development programs as well as within the work setting in general.

IITA's Deputy Director General for Corporate Services, **Hilde Koper**, emphasized that the organization needs to do even more to be inclusive and meet the CGIAR-set benchmark of at least 40% women in the workplace. She stated that by bringing in more women to the agricultural industry, there would be an increase in female scientists and, ideally, female breeders. Koper also underlined the significance of involving young people and women in agricultural and breeding projects because women currently greatly contribute to the food production sector and their preferences should thus be taken into account when developing new varieties. Second, she discussed the need to develop

ways to make the agricultural sector more appealing to attract more young people as it is currently dominated by the elderly.

Keynote speakers

Chiedozie Egesi, cassava breeder and executive director of the National Root Crops Research Institute (NRCRI) and project leader of NextGen Cassava, stated in his speech that cassava is a gendered crop that is traditionally grown and processed by women for consumption, and that it has the potential to increase women's income. The NextGen Cassava project is a breeding project that aims to empower both female and male farmers and processors by using innovative and sustainable cassava breeding methods. To address the issue of gender preferences, the NextGen Cassava project created Smarter Cassava Breeding, an initiative that makes use of market intelligence tools to better understand farmer preferences. Egesi also emphasized that the diversity of disciplinary expertise beyond breeding is key to the development, release, and deployment of the best varieties that have the potential to transform Africa's agricultural food landscape.

Peter Kulakow, IITA cassava breeder, commended that Gender Responsive Breeding has become a key priority to IITA. He recalled his first experiences with the organization in 2009, when he noticed that the cassava breeding field days were male dominated. This prompted the need to create more gender-balanced settings during their field days, and he testified that this was changed to a more balanced setting through various pathways taken including the involvement of local extension agencies. In part of his speech, he stated that the cassava breeding team realized that those who receive information about their new technologies or varieties, as well as those who provided input that guides them in the development of new technologies, influence the success of the product. This brings gender responsive breeding into the equation, as it ultimately focuses on the diversity of groups of people, taking into account their roles in farming, agriculture, processing, and consumption of the product. He believes that this is significant because it allows breeders to reach out to traditionally marginalized groups in society, and in turn results in the production of varieties that are favoured by such groups.

Steven Cole, IITA-Gender Science Lead based in Tanzania, emphasised the importance of gender inclusion in breeding, biophysical sciences, and other agricultural research fields. He first highlighted the importance to morally commit towards goals of gender equality, women's empowerment, and empowerment in general. Incorporating gender has the added benefit of getting existing products off the shelf and reaching more people along the product value chains. This has enabled a better targeting of different groups of people from different market segments. Another advantage of incorporating gender into breeding is that new products can be better designed as they are tested and refined to benefit more seed multipliers, producers, farmers, and others. In a nutshell, breeding initiatives will be able to release varieties that meet the needs of different groups of people, resulting in greater benefits for all. The final benefit of incorporating gender into breeding is that new products will be disseminated or promoted alongside social change innovations or different types of approaches, empowering more people, and transforming unequal power relations, discriminatory structures, or social norms. He concluded by wishing the group a productive training session over the following three days and thanked the training team for organizing it.

Introduction of participants' expectations

To officially begin the training activities, participants were given three flash cards that would be used to state and voice their expectations, likes, and dislikes about the agenda of the training. They were thus given one **yellow** flashcard to write out their expectations for the training, one **blue** flashcard to specify their likes about gender research in breeding, and one **pink** flashcard to specify their dislikes about gender research in breeding. After filling out their expectations, likes, and dislikes on the cards, participants were asked to trade them with the person seated to their right. This person would then introduce and read out the written expectations for the person they exchanged cards with. The responses read out by participants are summarized in Box 1 and 2.

Box 1: Expectations of the training

- To gain understanding of practical application of gender integration in breeding.
- To understand gender and how it relates to breeding.
- Gain an understanding on the collection and analysis of data on gender in plant breeding.
- To learn techniques or approaches on how to integrate gender into a breeding program.
- Gain an understanding on how gender can impact breeding activities.
- To learn more about the modifications that should be made or implemented for parties who are already including gender into their breeding operations.
- To further improve on approaches currently being used in gender involvement in breeding.
- To identify the role of gender in yam breeding and getting clarity of when or at what stage in breeding gender should be involved.
- Understand how to integrate gender into the entire breeding value chain.
- To identify crucial crop traits for gender responsive breeding.
- To have an in-depth understanding of gender concepts in relation to plant breeding.
- To have a clear explanation of the basic terms used in gender responsive breeding, and their implications on variety development and adoption.
- To understand how to utilise large gender captured data for integration in product design.
- Gain an understanding on the practicability of integrating gender into breeding research.
- To gain an insight on how breeding initiatives can be made simpler through this training.

EXPECTATIONS

Delphine Amah

To gain understanding of Practical application of gender integration in breeding.

ABUSH T. ABEBE

① Expt. Learn techniques or approaches to. on how to integrate gender into a breeding program.

To identify the role of gender in improving yam breeding especially; at what stage of Breeding should gender be involved.

Christian Nwadili

Oyelade - Theophilus Toyeye
I want to understand gender and how it relates to breeding

2. How to integrate gender in my breeding programme

Sory Diallo/Mali.
How Gender can impact on breeding activities.

Wende Mongesan
- How to integrate gender in the entire breeding value chain
- How to fast-track gender in breeding

Silvestro Masaba
Identifying crucial crop traits for Gender-responsive Breeding

DIBI KONAN (CNRA - COTE D'IVOIRE)
- Strategies to wake take in account gender in breeding

VISIT
Understand: How Breeding can be made simpler through this training

Expectation: Paula Iragaba
Practicability of intergrating gender into breeding research

DANSi Alexander
• understanding collection and analysis of Data on gender issue in breeding

SIKIROU Mouritala
Here to know if we are working for gender already we have to adjust our search.

Edemodu Alex
Improvement on our approach in Gender Involvent in our breeding

② Understand How to efficient take care of gender driven trail into to Our Product profiles during their development

JOSEPH BATIENO

ISMAIL RABBI
I expect to learn about how gender can be integrated into breeding i.e: population improvement, variety extraction and deployment.

My name is Oei
1. My name is Oei Friday Uganda. from Ebony State University
2. I am expecting to learn about the role of gender responsiveness in Plant in breeding.

Olusola Thomas
More impacts thro. gender inclusiveness of yam crop breeding

MUHAMMAD LAWAN Umar
MAIN EXPECTATION
TO HAVE A CLEAR EXPLANATION OF THE BASIC TERMS USE IN GENDER RESPONSIVE BREEDING. AND THEIR IMPLICATIONS ON VARIETY DEVELOPMENT AND ADOPTION

Emmanuel Chamba
Indepth understanding of gender concepts in relation to plant breeding.

Name :- Dr Lydia Jiwuba
Expectation: How to integrate gender efforts into breeding

How to integrate gender issues in breeding program.

Baukar Ousmane

Dorcas Ibitoye
utilize bye To capture, gender captured - data for integration in product design

| Box 2: Likes and dislikes about gender research in breeding	
Likes about gender research in breeding	**Dislikes about gender research in breeding**
- The improvement of adoption by both men and women. - Women performance in cowpea breeding. - The idea that gender research makes it an inclusive process and allows for better targeting of breeding processes. - The inclusivity involved in decisions such as traits and preferences. - Enhanced adoption of gender responsive technologies. - Activities distribution regarding gender. - Gendered responsibilities in breeding and participatory variety selection. - The participatory evaluation of varieties.	- High expenses that come with involving all stakeholders. - Expenses that come with trying to carry out research on different cultures. - Gender research in breeding is time consuming when considering all aspects of gender in breeding. - Navigating social barriers as they relate to gender groups across diverse environments. - Trying to ensure that all diverse needs of the many gender categories within society are met. - The complexities involved. (x2) - Participatory evaluations. - Nothing. (x6)
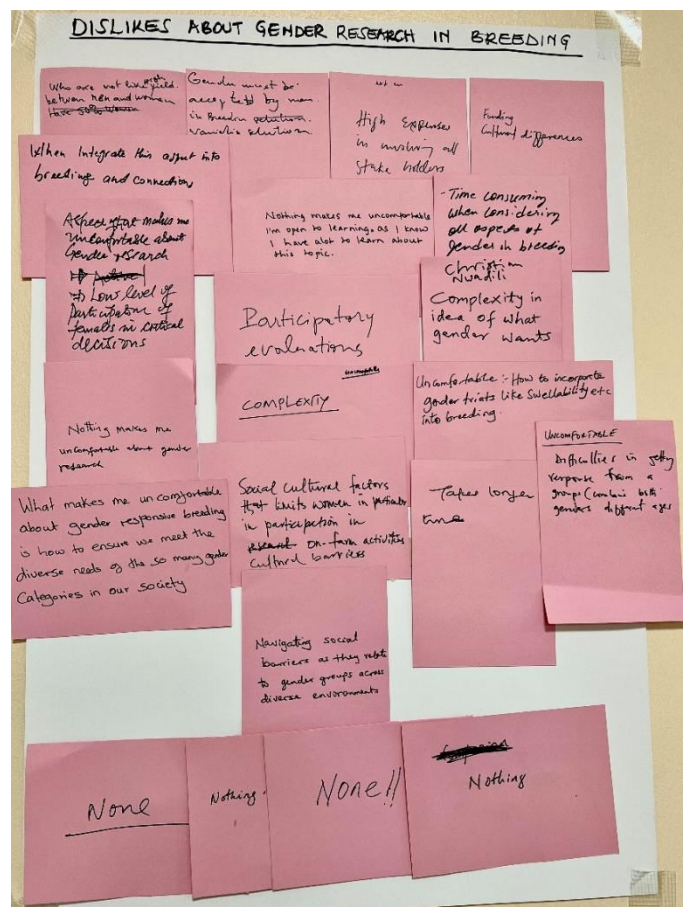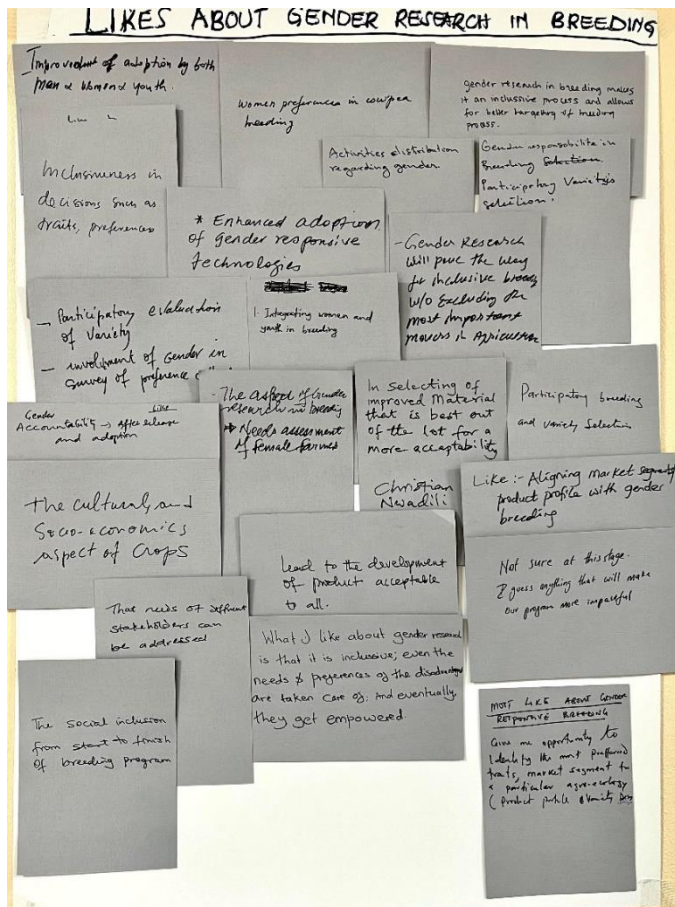
Gender concepts and awareness (I)

Following the introductory phase, Millicent Liani, Martina Cavicchioli and Olamide Deborah Olaosebikan conducted a session to familiarize participants with gender-related concepts. This session was divided into two parts: one meant to introduce participants to gender concepts that usually inform approaches in agricultural research, and another on intersectionality, which involved a role-play. This session was intended to provide participants with the opportunity to critically reflect on their place in society, to recognize the importance of addressing social inequalities in scientific research, and, finally, to recognize the importance of conducting a social impact assessment of an intervention.

The first session slot included an interactive exercise that allowed participants to elaborate on visual and embodied interpretations of gender roles, concepts such as equality versus equity, and also voice out their thoughts on the concepts. They read out dialogue conversations on examples that explained the differences in how men and women perceive their different gender roles and how such situations result in gender inequalities. They were introduced to a variety of ideas and frameworks, including the distinction between gender and sex, approaches to gender integration, the Reach-Benefit-Empower-Transform (RBET) framework, and the "traffic light" showing the shift from gender exploitative, to sensitive, and finally to transformative approaches, to name a few.

Some of the participants' questions focused on gender norms and stereotypes, as well as on how to transform existing cultural beliefs that contribute to gender inequality. Millicent Liani provided a few examples of transformative approaches to deal with such restrictive cultural norms. She mentioned conversations at the community level, as well as approaches such as household methodologies or gender action learning approaches. She explained that such tools and approaches can be used to unpack and synthesize the underlying harmful norms in order to try to change people's mindsets and behaviours.

Who are we breeding for? Identifying crop user segments and setting breeding objectives

This session was facilitated by Martina Cavicchioli and Béla Teeken and was meant to build an understanding on why gender matters in market segmentation and product profiling and what questions help breeders make more informed choices towards a greater social impact: When are gender differentiated traits necessary? What is their impact? What are the trade-offs?

The session began with a presentation about how gender affects value chain analysis, the social consequences of breeding decisions on value chain actors, and how to integrate breeders' efforts with other types of agricultural technologies. This presentation was followed by an interactive group exercise for crop teams with the following instructions:

"Your crop team is working on a proposal to receive funds for a new variety. To win the call you have to provide a very convincing argument about the benefits this new variety will create for the population in your area of intervention. Build on your year-long experience spent conversing with farmers and observing them in their work activities related to the crop: what is the highest social impact that your breeding program can achieve?"

With this scenario, the various crop teams were expected to briefly present their proposals to "donors" – the remaining participants in the room – who were then expected to provide feedback on

the proposal based on the expected social impact of the program and its feasibility. In these presentations, the teams were to:

a) Describe the identified crop users' segment and present the reasons why they chose it.
b) Outline the breeding objectives of their program as per the crop users' segment that was chosen.
c) Highlight the product profile to achieve the programs' objectives, stressing out the opportunities and the trade-offs associated with its development.

Different crop teams working on (above) and presenting (below) their proposals.

The boxes below (3-8) briefly present the outcomes of each crop team's group work. This was a learning activity and the outcomes of this exercise were not supposed to be implemented.

Box 3: Cowpea

The cowpea team's proposal was to be developed in the West African region, specifically in the Guinea Savanah zone, which has rainfall ranging from 900mm to 1200mm. Their initiative is targeted to both women and male farmers, however certain roles are designated to certain genders – e.g. processing to be done by women.

The main goal was to breed cowpea that is less time consuming and therefore requires less energy, specifically: (1) the plant architecture traits considered are those in which the pods are above the canopy, as this would make harvesting and insect management easier; (2) cooking time would be reduced and so require less energy.

Feedback to the group: A commenter praised the traits that the group chose to improve, stating that they were a good choice, but the audience felt that there was a lack of alignment between the objective and the user segment.

Box 4: Plantain

The plantain team's area of focus was Southern Nigeria, a region characterised by hot, humid forests with variable rainfall patterns that are sometimes high or medium. The main breeding objective was to develop plantain that is high yielding with improved shelf life for income stability and food security. The proposed user segments consisted of men, women, and youth. The processors would mostly be women whilst the consumers will be consisting of all the user segments. This endeavour was to address the short shelf life for consumers and processors, but they also hoped that other market groups' needs would be satisfied and that the new varieties would have a more favourable overall impact. This idea may result in nutritional content loss during storage. Farm gate processing will allow to address this trade-off.

Feedback to the group: Overall, the group was commended for identifying the specific location of development for the variety. They were also commended for concentrating on a single idea to solve a specific problem: shelf-life expansion.

Box 5: Cassava
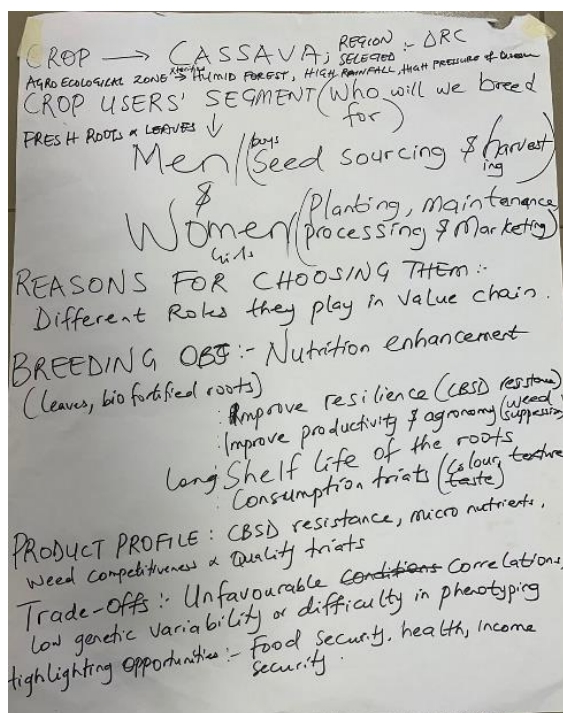
The selected country was the Democratic Republic of Congo (Central Africa), which is located in a region characterised by high rainfall, with a hot and humid climate. The identified user segment was men, women, and youth (boys and girls) as they all play different roles to achieve the full cycle of work within the value chain.

The objectives of the proposed initiative were to enhance nutritional value in the leaves, biofortification of the roots, disease resistance (specifically of cassava brown streak virus disease). They also aimed to improve productivity and have high yields and agronomic traits like weed suppression, long shelf life of the cassava root and more.

Feedback to the group: The audience commended the group for presenting a balanced presentation on the development of the new cassava variety. The group was said to have covered a broad developmental initiative; however, this may also be a weakness as achieving all these objectives may be unrealistic.

Box 6: Soybean
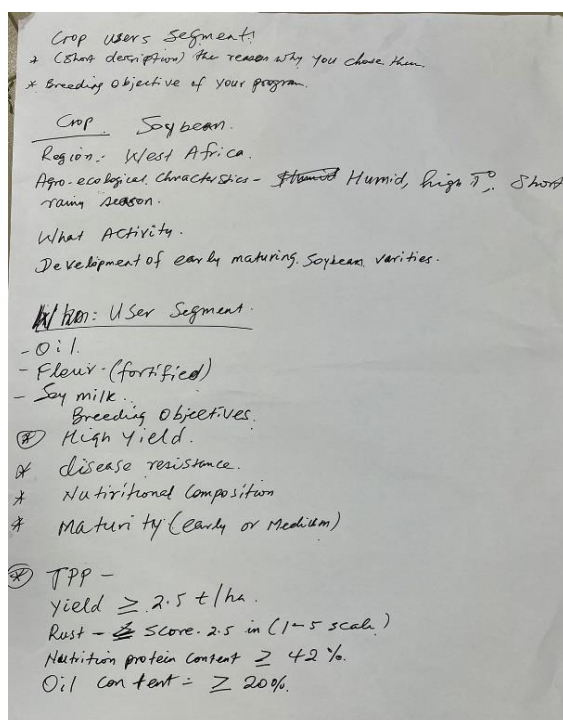
The proposed primary objective was to develop early maturing soybean varieties in the West African Region, which is characterized by hot and humid conditions and short rainy seasons. Other breeding goals included the development of a high-yielding, disease-resistant soybean variety with a high nutritional composition. This variety was intended for use in the production of oil, fortified flour, and soymilk. The values for the target product profile are indicated in the flipchart.

Feedback to the group: The proposal was well received but criticized for the lack of clear definition of crop user segments, stating who these variety development initiatives were aimed at and why.

Box 7: Yam
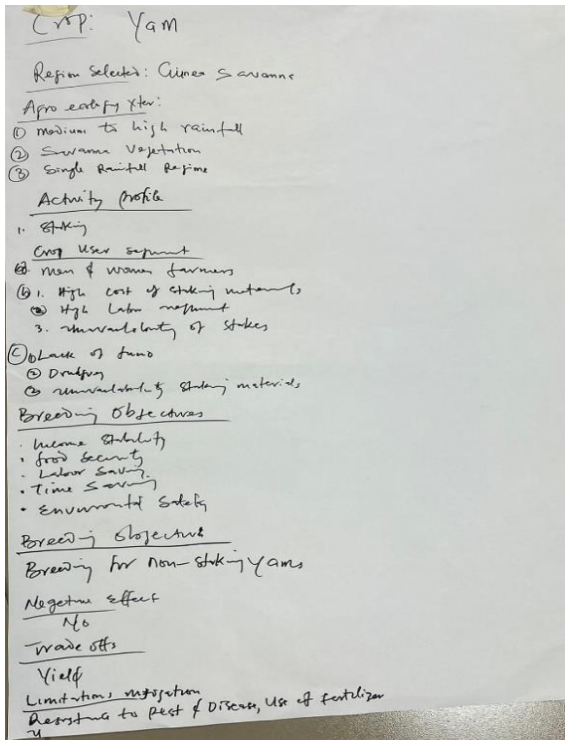
This proposal aimed to develop a breed of non-sticking yams. Both men and women were targeted as crop user segments. The proposal was motivated by the high cost of yam sticking materials, the high labour requirements, and the scarcity of sticks to support the yam. As a result, in addition to the other goals, the development of non-sticking yams should address farmer income stability, increase food security, be less laborious, and, most importantly, reduce environmental degradation caused by farmers cutting down trees for sticking. With the development of such a variety, a trade-off could be a reduction in yield; however, they proposed using agronomic interventions, combined with the use of fertilizers, as well as targeting means and ways to develop disease resistant yams during the breeding procedures, in order to maintain high yields.

Feedback to the group: The audience asked how the group planned to make the yams non-sticking and what else they might grip to if not the sticks. In addition, they received criticism for failing to specify their threshold in their product profile. Finally, they were questioned about how they planned to account for time and labour savings in their breeding pipeline.

Box 8: Maize
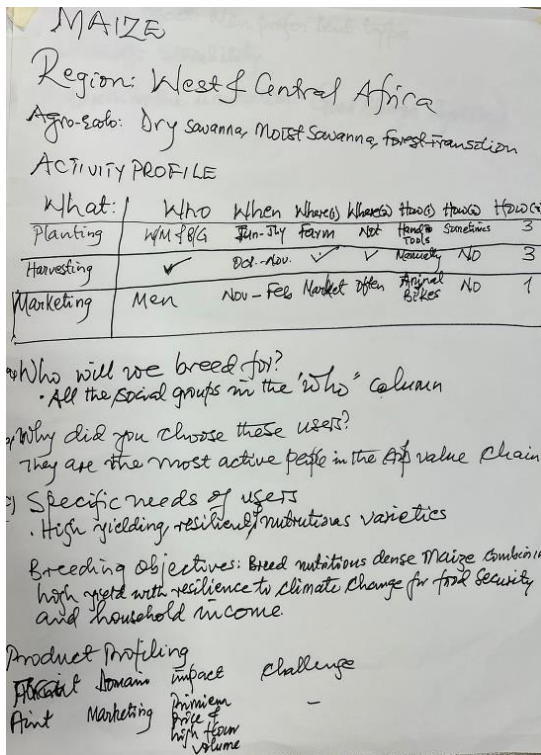
The aim of this proposal was to breed nutritious dense maize while combining high yield with climate change resilience for food security and household profile. This initiative's focus was proposed to be in West and Central Africa. Dry savannah characterizes the agroecological conditions. The group presented a well-structured and informative activity profile, stating that men, women, girls, and boys would be the most active and capable crop user segment. They specified the dates and times for planting, harvesting, and marketing, as well as the key players in each role. Because of its marketability and premium prices, the group proposed developing flint maize. They also considered storability to be an important characteristic for the new variety.

Feedback to the group: Overall, the maize crop team received very positive feedback, with many people saying that their proposal was very convincing because they were able to analyse their value chains and show the roles each actor will be playing as well as the challenges associated with that. They were also praised for addressing the needs of both men and women throughout the process. The criticism they did receive was that the social groups they mentioned provided a simplistic view of the value chains.

Gender concepts and awareness (II): Intersectionality

This session followed up on the morning session on gender concepts to introduce the one of "intersectionality" in a playful way. The trainees were invited to participate in a role play that allowed to resurface and be re-embed in their minds most of the concepts they had learned in the morning.

For the role-play on intersectionality, called "One step forward" (Fischer et al. 2019), the facilitators asked 15 of the 24 participants to stand along a marked line. Each of the 15 participants was given a role that reflected the identity they would be portraying. These assigned roles were descriptive of various positions in society and lifestyles, creating an entirely new identity with different demographic information that would either privilege or disadvantage the participants. The newly assigned roles were to be kept a secret from the other participants. The facilitator would then read a scenario and invite participants with a specific identity trait to either step forward, move backwards or remain where they were standing. The rest of the group (9 trainees) were invited to sit and assess the dynamics going on during the role play as external observers. For both groups, this exercise provided first-hand knowledge of the various realities faced by farmers. It also provided insights into how factors other than gender can have a positive or negative impact on a person's position in society. Lastly, it allowed to reflect on how breeding initiatives can help to alleviate constrictive situations, as well as how targeting the correct user can help to alleviate the injustices faced by different farmers of different social groups.

With this activity, participants realized that constraints such as gender, age, disabilities, and position within the society, to mention a few, contributed to some of the major failures amongst the farmers. The wealthier farmers, who were at positions of power or where related to those of high social strata, were at an advantage. In general, male farmers also had an added advantage in most described situations compared to the women. Overall, this activity provided participants with a foundation for understanding how aspects of a person's social and political identities interact to create different modes of discrimination or privilege. With this, participants gained a clear understanding of intersectionality and how it identifies multiple factors of advantage and disadvantage.

The first day of training concluded with a discussion of the activity and clarification on some gender terms and concepts of those presented in the morning.

Chosen participants for the role play standing by the starting line (left) and
steps ahead of others, according to how favourable their chosen roles were (right).

Day two – 22 September 2022

The second day started with a recap of the previous day's activities. This allowed the participants to go over what they had done the day before and review the gender concepts they had learned. They were also given the opportunity to express their difficulties with the crop user segmentation exercise from the first day, as well as to revise their understanding of intersectionality, and get some clarification.

Gender-responsive tools and their application

Following the feedback sessions, Béla Teeken, Olamide Deborah Olaosebikan, Bello Abolore, and Elizabeth Parkes led a session on gender-responsive tools and their application. This session allowed the participants to learn from the cassava engagement with users through participatory approaches and consider how to apply them to their own breeding program.

To start off, the cassava gender team held presentations on different gender responsive approaches that have been implemented and sketched the trajectory from surveys to participatory approaches. They also pointed at participatory approaches as more suited to capture the large amount of tacit knowledge among cassava users compared to survey questionnaires. They also highlighted that participatory methods are more inclusive towards most knowledgeable crop users compared to other methods for which ability to communicate and dialogue is necessary (i.e. a mechanism excluding people with low levels of literacy or communication). These approaches identified and informed deeper understanding of specific agronomic, food product quality, and processing traits, the latter related to processes such as ease of peeling and toasting time. In order to investigate the external validity of breeding trials and measuring genetic gain in farmers' fields, the team adopted various interrelated approaches for proper social/gender segmentation: first, the implementation of the mother-baby trial (MBT) approach and then the scaled variant the Triadic Comparison of Technology (TRICOT) approach combined with the implementation of standard surveys based on the Poverty Probability Index (PPI), Rural Household Multi Indicator Survey (RHoMIS). The cassava team also presented the 1000 Minds Survey, an approach in which crop trait scenarios of equal economic value are compared with crop users. These approaches enable an in-depth documentation of the traits prioritized among crop users.

To further explore on gender-responsive tools and their application, the cassava team led the participants into an activity whereby, based on their understanding of the presentations, they would write out what kind of approaches they liked and found suitable to their own breeding program and why. Tables 1 and 2 show the outcomes of this exercise.

At the end of the session, trainees understood the rationale for adapting and incorporating any of these approaches into their respective breeding programs to make it inclusive and gender responsive.

Table 1: GRB Approaches chosen by crop teams

Crop Teams	GRB Approaches						Comments
	1000 minds survey	*Poverty Probability Index (PPI)*	*Rural Household Multi Indicator Survey (RHoMIS)*	*Household Food Insecurity Access Scale (HFIAS)*	*Women Empowerment in Agriculture Index (WEAI)*	*Customised Questionnaire*	
Yam	✗	✓	✓	✗	✗	✓	The team had no knowledge regarding the 1000 minds survey, thus they were not interested in adopting it. The PPI, RHoMIS and customised questionnaire were described as simple to use, able to provide useful information and suitable, respectively.
Plantain	✗	✗	✓	✗	✓	✓	The team preferred the RHoMIS method as it gave them a better understanding of the rural population in regards to food security and market access. The group also leaned towards the WEAI as it helped them understand gender roles and women's ability to access resources.
Soybean	✓	✓	✓	✗	✗	✓	The team was interested in adopting 4 out of 6 of these methodologies as they consider the economic weights for trait prioritization, determine the socioeconomic profile of the farmers, and give information on the farmers group. The methods that the team were not sure about adopting the WEAI and the HFIAS.
Maize	✗	✗	✓	✗	✓	✓	The team indicated interest in surveys cutting across social groups, such as RHoMIS. The customised questionnaire provides primary information and WEAI provides good feedback from women in agriculture. Not interested in PPI because it requires background in socioeconomics.
Cowpea	✓	✗	✓	✓	✓	✓	The team was not interested in PPI as they had little information about it. They indicated interest in RHoMIS as it works with target households. Interested in adopting the WEAI because it measures the levels of involvement of women.
Cassava	✓	✓	✓	✓	✓	✗	PPI, RHoMIS and WEAI approaches were viewed to consider the social qualifications and to adopt an intersectional approach. 1000 minds approach helps understanding the different traits prioritized by the end users and in coming up with the economic weights.

Answer sheets completed by the crop teams (annexed to Table 1)

Table 2: Variety/trait evaluation approaches chosen by crop teams

Crop Teams	Variety/traits evaluation approaches				Comments
	Mother Baby Trial	*RTB Foods Participatory processing and product evaluation*	*TRICOT On farm trials*	*TRICOT consumer testing*	
Yam	✓	✓	✓	✓	Interested in RTB for product quality assessment and TRICOT for reliability.
Plantain	✓	✓	✓	✓	Mother Baby Trial portrayed to be an easy trial to adopt.
Soybean	✗	✗	✓	✓	Interested in TRICOT for its ability to accelerate the adoption of new technologies. Not interested in the mother baby trial as it is covered in TRICOT.
Maize	✓	✗	✓	✓	Interested in the mother baby trial as it can be well established and in TRICOT for its simplicity (reduces the paperwork). Whilst RTB foods participatory processing and product evaluation was assessed to not be for maize.
Cowpea	✓	✓	✓	✓	Interested in all the trials for various reasons, including knowledge and evaluation of food.
Cassava	✗	✓	✓	✓	Interested in almost all the methods and varieties except for the mother baby trial because of its old-fashioned nature. They were interested in the TRICOT approach for its inclusiveness.

Answer sheets completed by the crop teams (annexed to Table 2)

Taking stock of current practices by the crop breeding teams

The goal of this session was to assess what the various breeding teams were currently doing in terms of getting feedback from crop users (mainly through participatory approaches) and to discuss what they can do to be more gender-responsive and end-user focused.

Some days before the start of the training, the participants had been requested by the organizing team to prepare and give a short presentation on participatory approaches currently in use in their respective breeding programs. A representative from each of the six crop teams gave a short input during this plenary session. Each crop team discussed what they were currently doing and implementing, as well as their ambitions, challenges, constraints, when and how they engage farmers/processors/consumers for evaluations. The presentations were also inclusive of what kind of evaluations are done and when: points of inclusion of participants, types of data collected, how data is analysed and stored, and how it is combined with technical breeding data, challenges, ambitions, constrains and discussions.

Participant presenting the current practices they are implementing.

One of the six presentations was given by the cowpea group, who stated that the current methods they use for evaluating advanced breeding lines include the Multi location Trial (MLT), New Plant Type (NPT), farmers' Participatory Varietal Selection trials (PVS), "seeing-is-believing" variety testing, and on-farm TRICOT. The group also discussed the methods they used to obtain feedback from end-users and explained that with the feedback provided, it can be difficult for participants to express their true opinions due to external factors such as their leaders, husbands, and parents, among others. To alleviate difficulties, cowpea research teams stated that they usually consider communicating with representative farmers who assist them in bringing an equal number of male and female participants to eliminate bias. Also, due to cultural norms that are restrictive to women, it is sometimes necessary to separate men and women during conversations and interviews to allow both genders to be free and expressive.

During the course of the presentations by the groups, the issue of respondents appreciation in the form of cash/kind and giving and sharing the results of the study with the respondents was raised as the plantain crop team mentioned that it is difficult to get participants to evaluate the crop: participants ask often for their benefits for such involvement, while researchers seldom give feedback of the results of study conducted, an attitude undermining credibility and the possibility to build trust with the local communities.

With regards to the first point, it was cleared that, as it is important to appreciate respondents' time, it is out of place to use cash for compensation of participants' involvement in any activity, as this may affect or influence results given by the participants. The use of gifts that respondents may need was proposed as more appropriate. Agricultural extension staff could help facilitating this process and so the relationships between the researchers and the communities.

As for the second point, it was underlined the importance to give feedback to participants within the communities where research has been conducted. This gives sense of respect to the participants, as well as a sense of belonging, as they will see themselves as part of research and will be more willing to participate in the future. This will help build trust between researcher and respondents. On that note, it was agreed that compensations in the form of gifts should not replace the need to share the results with the respondents.

Trait prioritization among users and social impact

The G+ tools are intended to help plant breeders and social scientists collaborate so that programs incorporate gender issues from breeding implementation to impact assessment. In this session, the facilitators informed the participants on the issue of anticipating trade-offs and how to deal with them by introducing them to a role-play group exercise using the G+ tool.

The exercise revolved around trait prioritisation with crop users using frequencies of traits mentioned or ranking of traits with crop users. Crop teams played the role of men and women crop users and were to provide 3 ranked pre-harvest and 3 ranked post-harvest traits. The possibility of ranking with the crop users as well as basing rank on the frequencies with which traits were mentioned by crop users were highlighted. Which method to choose depends on how crop users are confidently able to rank traits. The cassava experience was that often people were not able to rank as they stated all traits were equally important and often related, so the frequency count was used. This exercise was based on the RTB foods methodology as presented (Forsythe et al., 2021). After the ranking exercise, the crop teams were now asked to evaluate one pre-harvest and one post-harvest trait for social impact with regards to gendered benefits or possible harmful unintended consequences. Here they used the G+ product profile query tool. Participants evaluated the two chosen traits by responding to the possible positive effects questions (positive/negative) and the possible negative effects questions for proper understanding of impact (social/economic) that inclusion of certain traits in the breeding program may have on the value chain actors. Breeders in attendance found the prioritization and G+ tools exercise important to incorporate into breeding program. The day ended on a reflective note of the topics and the activities that had been discussed during the day.

Day three – 23 September 2022

G+ Tool and ranking exercise

Day 3 started with presentation of each crop team on the assessment of traits using the positive benefit and do no harm questions from the group exercise on the G+ tool proposed in day 2. Most traits assessed had more positive benefits and very few do no harm.

In a summary of the trait ranking exercise, the six crop teams identified three important agronomic traits specific to their crop, as well as three important post-harvest traits. The traits were ranked by importance for women and men, and the results revealed that generally women preferred quality traits such as texture, whereas men preferred traits that were likely to generate more income, such as higher yields.

The G+ tool activity came after the trait ranking exercise. The G+ tool is thus a method for directing data collection in order to prioritize traits in product profiles by taking into account both the traits' potential positive and negative gender-related effects. Crop teams chose one agronomic trait and one post-harvest trait to access in the following exercise. Drudgery reduction, the impact on women's paid employment, quality and quantity improvements, and both men and women's valuations were addressed to assess the potential positive and negative effects of the chosen traits on both genders.

In a nutshell, the results showed that most of the traits chosen by the various teams, such as reduced cooking time, improved textures, seed quality, and taste, had positive effects such as reduced drudgery or increased market value, whereas others, such as increased yields for crops like maize, required more management and workforce, increasing drudgery but positively impacting output levels and income. Such results varied according to crop. For instance, while increased yield would require more manpower for a crop like maize, for crops like yam, with higher yields, drudgery would be reduced significantly because a smaller area would produce higher output. As with yam in areas where it is regarded as a king crop and dominated by men, land is insufficient and fragmented, so higher yield would benefit women with limited farmland, as many large roots can be harvested from a single stand of yam. Various results were generated for all crop teams, which assisted the teams in assessing the pros and cons that could result from their chosen traits, as well as how and why it would benefit both genders.

Transdisciplinary management in product advancement

After a short follow-up on the G+ Tool exercise proposed in day 2, the first session of the day addressed the topic of transdisciplinary management in product advancement. Béla Teeken started with a presentation on the importance of team composition, and how such composition determines what knowledge is generated. This presentation was followed up by one by Gaby Mbanjo that focused on transdisciplinary breeding product management based on the example of the cassava team.

The objective of this session was to raise consciousness about breeding as a transdisciplinary process where product profiles and product advancement are to be determined by the input from a transdisciplinary team consisting of the technical breeding team, food scientist, market specialist, agronomist, pathologists, social/gender scientists and market specialist. This is also a condition that

allows good gender integration into breeding. The presentations provided examples on how to achieve such a transdisciplinary organisation of breeding by highlighting the need to determine roles, responsibilities, and decision-making rights for each of the members of this transdisciplinary team. A similar presentation was given to the Excellence in Breeding platform and can be viewed here: https://www.youtube.com/watch?v=L8Sfevy3eq0&t=262s.

After the presentation, the crop teams were engaged in an exercise in which they had to map all the experts needed at each stage of the breeding process and to determine what kind of decision right they would have, as per the RAPID model (Recommend, Agree, Perform, Inform, Decide). The outcome (Table 3, p. 27) illustrated that next to different scientific experts, also crop user representatives would have a role in product advancement meetings and the breeding process in general.

Gaby Mbanjo during her presentation on transdisciplinary management

Crop team	Stage 0	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6	Stage 7
	Product design	*Trait Discovery*	*Trait deployment*	*Crossing & Screening*	*Early testing*	*Late testing*	*Pre commercial testing & product registration*	*Product introduction*
Maize	• Breeders - *D* • Socio economists & gender scientists - *R* • Molecular biologists – *A* • Biometricians – *I* • Product managers - *R* *The group stated that for maize, the first two stages, which are product design and trait discovery, are merged into one stage.*		• Breeders - *D* • Molecular biologists- *A* • Technicians – *P* • Pathologists • Entomologist ⎫ *I* • Virologist ⎭		(Stage 3) • Breeder - *D* • Technician - *P* • Pathologists ⎫ • Entomologist ⎬ *R* • Virologist ⎭ • Biometrician ⎫ *I* • Data analyst ⎭	Regional trials in Maize • Breeder – *R* • NARS - *D* • Ext. agents ⎫ • Seed comp. ⎬ *I* • Economist - *R*	• Breeders ⎫ *R* • NARS ⎭ • Seed regulatory agency - *A* • Extension ⎫ *P* • Farmers ⎭ • Variety release committee- *D*	• NARS- *D* • Seed companies - *A*
Plantain	• Social scientists – *P* • Gender experts ⎫ • Seed system experts ⎬ *A* • Phenotyping experts ⎫ *R* • Breeders ⎭ • Pathologist • Product manager – *D* • Value chain actors (inclusive of representatives who are farmers, processors etc)	• Molecular breeder • Phenotyping expert • Pathologist	N/A	N/A	N/A	N/A	N/A	N/A

Crop									
Cowpea	• Breeders - **D** • Socio-economists • Food scientists • Gender specialists • Agronomists • Crop Protectionist ⎤ **R** *Includes value chain actors as well – farmers, producers, processors, marketers etc.*	• Field breeders - **D** • Bioinformatician – **I** • Entomologists • Pathologists • Physiologist • Molecular breeders ⎤ **P** • Agronomists	• Molecular breeders - **R** • Field breeders - **A** • Bioinformatician • Entomologists • Pathologists • Physiologists ⎤ **P**	• Breeder –**A** • Entomologist • Pathologist • Physiologist ⎤ **I** • Nematologist • Agronomist	• Breeders - **D** • Agronomists - **R**	• Breeders - **D** • Agronomists - **R**	• Breeders -**D** • Agronomists - **R** *Includes value chain actors as well – farmers, producers, processors, marketers etc. – whose role is to recommend.*	• Breeder Agronomist ⎤ **R** • Extension agent - **P** • Release committee – **A** *Includes value chain actors as well – farmers, producers, processors, marketers etc. – whose role is to recommend.*	• Social scientists – **R** • Extension agents - **P** • Seed regulators - **R**
Soybean	• Product manager • Social Scientist • Breeders • Agronomists • Food scientists • Value chain actors • Processors • NARS • Extension experts • Seed companies	• Breeders • Pathologists • Food scientists • Molecular breeders • Entomologists	• Breeders • Pathologists • Entomologists • Physiologists • Molecular breeder • Food scientists	**These three stages in their design were to be performed by similar parties as listed below:** • Breeders • Breeders service providers • **The late stages of stage 5:** Late testing, breeders will work along with the product manager				**Stage 6 and 7 also shared the same actors listed below:** • Product mangers • Breeders • Market economists • National Variety Release Committee **However, stage 7 further engages:** • **NARS** • **Seed companies** • **National Soybean associations.**	

Yam	• Social scientist – **R**
	• Breeders – **D**
	• Data Scientists ⎤ **I**
	  Agronomists
	• Product manager – **A**
	• Value chain actors include farmers, consumers, processors, and marketers – **I**
		• Breeders – **D**
		• Molecular biologists - **R**
		• Pathologists – **R**
		• Field technicians – **P**
		• Data scientists – **I**
			• Breeders – **D**
			• Pathologists – **I**
			• Agronomists - **R**
				• Breeders – **D**
				• Agronomists – **R**
				• Data analysts – **I**
					• Breeders – **D**
					• Agronomists – **R**
					• Data scientists – **I**
						• Breeders – **D**
						• Agronomists – **R**
						• Data scientists – **I**
						• Food scientists – **I**
						• Product manager – **A**
						Value chain actors include farmers, consumers & processors – **I**
							• Breeders – **D**
							• Agronomists – **R**
							• Data scientists
							• Food scientists
							• Commercial specialists ⎤ **I**
							• National release council
							• Product manager – **A**
							(At this stage the national release council also inspects whilst making their inputs and agrees)
							Value chain actors include farmers, consumers & processors.
								• Breeders
								  Seed specialists ⎤ **R**
								• Social scientists
								• Product manager – **A**
								• National release council – **A**
								Value chain actors include farmers, consumers, processors and marketers - **I**	

Cassava							
• Socio economists – **D** • Value chain specialists inclusive of farmers, processors, consumers – **A** • Gender scientists – **A** • Lead breeder and breeder – **A** • Trial manager – **I** • Communication experts (biometrician and data analysts) – **I** • Agronomists • Food scientists • Pathologists — **A** • Seed system specialists • Physiologists • Genetics — **R**	• Socio economists • Value chain specialists — **I** • Gender specialists • Breeder - **A** • Lead breeder – **D** • Trial manager – **I** • Biometrician & data analyst - **R** • Food scientists • Pathologists — **A** • Seed system specialists – **I**	• Socio economists • Value chain specialists — **I** • Breeder – **A** • Lead breeder – **D** • Biometrician &Data analysts – **I**	• Socioeconomists • Value chain specialists — **I** • Breeder – **R** • Lead breeder – **D** • Trial manager – **R** • Biometrician &Data analysts - **R** • Agronomist • Food Scientists • Pathologist • Physiologist — **R** • Seed system specialist	• Socioeconomists • Value chain specialists — **I** • Breeder – **D** • Lead breeder – **A** • Trial manager – **P** • Communication experts • Agronomists • Food scientists — **R** • Pathology • Seed system specialists	• Socio economists – **R** • Value chain specialists - **I** • Breeder – **D** • Lead breeder – **A** • Trial manager – **A** • Communication experts – **I** • Agronomists • Food scientists • Pathology — **R** • Entomologist • Seed system specialists - **A**	• Socio economists – **A** • Value chain specialists – **A** • Gender Scientists – **A** • Breeder – **D** • Lead breeder – **A** • Trial manager – **R** • Communication experts – **I** • Agronomists • Food scientists • Pathology — **R** • Entomologist	• Socio economists – **D** • Value chain specialists – **D** • Gender Scientists – **A** • Breeder & lead breeder – **A** • Trial manager – **P** • Biometrician – **R** • Data analyst and data manager – **I** • Entomologist • Pathologist — **A** • Seed system specialists – **A**

Gender dynamics in seed systems

The final session of the training was on gender dynamics in seed systems. This session was led by Millicent Liani, Elizabeth Parkes, and Mercy Elohor Diebiru-Ojo, a specialist in cassava seed systems working for IITA.

The aim of this session was to equip participants with knowledge on why gender integration matters in seed systems, whilst giving examples for specific root and tuber crop seed systems. To further give the audience a vivid understanding of the topic at hand, the session started with a [video](#) showing how the Integrated Seed Sector Development project in Africa (ISSD Africa) promotes gender-responsive and inclusive seed systems. Thereafter, Liani provided an overview of different types of seed system and highlighted the importance of integrated seed systems that combine both formal and informal seed systems. The key gendered concepts for seed system outcomes (known as "the 4As") were introduced. Specifically, the 4As pertain to 'Availability', 'Accessibility', 'Affordability' and 'Acceptability'. Liani later gave an overview on why gender matters in RTB crops seed systems.

Elizabeth Parkes, Mercy Elohor Diebiru-Ojo and Joyce Haleegoah, an invited online-guest from Ghana, presented some case studies of different crop seed systems under different projects and on different crops. Diebiru-Ojo provided case studies titled: 'The GIZ-GIAE/IITA Cassava and Maize Value Chain Project to create cassava seed entrepreneurs' and 'Enhancing Rural Livelihoods in Georgia: Introducing Integrated Seed Health Approaches to Local Potato Seed Systems'. Parkes and Haleegoah jointly shared insights on gender issues in tuber crops by sharing a case study on 'Community Action for improving farmer-saved Seed Yam (CAY-Seed) project' in Ghana. Thereafter, Parkes reminded the participants on the importance of utilizing the G+ Product Profile tool while reiterating that it complements effective functionality of narrowing the gender gap in seed systems. She then asked the participants to use flashcard to highlight interventions which they considered to support gender integration in the seed system. The results of this exercise are summarized in Table 4.

Table 4: Crop teams' proposed gender-responsive interventions in seed systems

Maize	Cowpea
• Prioritize women in seed systems. In the Northern areas of Nigeria, 99% of families are headed by men and this alone influences maize seed systems. • Involvement of women and youth as out growers to supply the raw seed to seed companies (and work towards seeds' certification). • Formation of corporations of women and youth to produce foundation seed. • Inclusion of women and youth in seed company activities.	• Work towards the inclusion of 50% women and 50% men during the demo trials. • Consider intersectionality during farmers' involvement in demo trials. • Support of female groups to evolve from growing cowpea grains to foundation seed level so as to enable them to get their own certified seed and use the foundation seed to grow community seeds.
Yam	Soybean
• The production of yam seed is intense and gendered to only males due to its strenuous nature, which women cannot handle. A possible intervention could address this problem and reduce the workload burden. • More advocacy to combat the gender stereotypes associated with yam farming.	• All social groups and both genders be represented equally and freely in training events and all other activities. • Prioritizing traits preferences important to different social groups in soybean breading initiatives.
Plantain	Cassava
• Increasing the involvement of women from the beginning to capture their demands in the new breeds and towards the end during the on-farm trials, to ensure that they are involved fully.	• Enactment of a quota in the area of seed systems that is expressly intended to benefit women and young people.

Training evaluation and certificates' awarding ceremony

The training ended on a reflective note for the participants, who were asked to evaluate the training. Among the many responses, some of the recurring suggestions on how the training could be improved included increasing the interactive activities, while many others suggested increasing the training length. Participants were also asked about their main takeaways from the training. Many of them testified about their newly acquired knowledge on gender concepts and approaches, as well as their realization of the importance of gender in crop breeding and how gender can be integrated into plant breeding initiatives. There was also an elevated request coming from the trainees for a follow-up, associated with the need of greater support from the gender experts in guiding and help in activity implementation, especially with regards to some concepts and tools introduced during the training. This request was taken in charge by the training organizers and readdressed during follow-up virtual chats with each crop team some weeks after the training, to monitor how specific learnings will be integrated and implemented. Table 5 is indicative of the responses from the participants' perceptions of the entire training.

Table 5: Participants' evaluation of the training

Statements	Participants' responses in %				
	Strongly Agree	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**
1. The training met my expectations.	34.78	**65.21**	0.00	0.00	0.00
2. I will be able to apply the knowledge learned.	34.78	**65.21**	0.00	0.00	0.00
3. The training objectives for each topic were identified and followed.	34.78	**56.52**	8.69	0.00	0.00
4. The content was well organized and easy to follow.	43.47	**52.17**	4.34	0.00	0.00
5. The materials on exercises were pertinent and useful.	**59.09**	40.9	0.00	0.00	0.00
6. The trainers were knowledgeable.	**86.95**	8.69	4.34	0.00	0.00
7. The quality of instructions on exercises was good.	**47.82**	43.47	8.69	0.00	0.00
8. The trainers met the training objectives.	45.45	**50.00**	4.54	0.00	0.00
9. Class participation and interaction were encouraged.	**82.6**	17.39	0.00	0.00	0.00
10. Adequate time was provided for questions and discussion.	26.08	**52.17**	17.39	4.34	0.00
11. The length of the training was sufficient.	8.69	26.08	30.43	**34.78**	0.00
12. The meeting room and facilities were adequate and comfortable	**78.26**	17.39	0.00	4.34	0.00

The training formally ended with a certificates' awarding ceremony, anchored by Prof. Michael Abberton and Martina Cavicchioli standing in for Prof. John Derera and Zainatou Soré, who could not attend the ceremony. Prof. Abberton congratulated the trainees for having participated in such an important training for IITA and breeding research, while Cavicchioli thanked the trainees for the great involvement and active participation in all sessions and discussions.

Michael Abberton and Martina Cavicchioli during the certificates' awarding ceremony