ICARDA

Science for resilient livelihoods in dry areas

Gender research and practice in agriculture for Protecting Ethiopian lentil crops: A pre and post training report

Meseret Tsige[1], Lemma Zemedu[2], and Dina Najjar[3]

[1] Post doctoral Gender Scientist, Social, Economics and Policy Research Group, International Center for Agricultural Research in the Dry Areas (ICARDA), Addis Ababa, Ethiopia m.tsige@cgiar.org

[2] Senior Agricultural Economist, Ethiopian Institute of Agricultural Research (EIAR), Addis Ababa, Ethiopia, zemedul@gmail.com

[3] Senior Gender Scientist, Social, Economics and Policy Research Group, International Center for Agricultural Research in the Dry Areas (ICARDA), Rabat, Morocco, d.najjar@cgiar.org

WORKING PAPER March 2025

The training that was used to write this working paper was carried out by ICARDA and EIAR as part of a project entitled ***Protecting Ethiopian lentil crops***, supported by Australian Center for International Agricultural Research (ACIAR) and the CGIAR Science Program Breeding for Tomorrow.

Working Papers
Working Papers are one of ICARDA's global public goods; they capture and share knowledge and learning from projects and research partnerships. Each paper is internally reviewed as part of the Center's publishing process.

Suggested citation
Tsige M., Lemma, Z, and Najjar, D. 2025. Gender research and practice in agriculture: A pre and post training report. Addis Ababa, Ethiopia: International Center for Agricultural Research in the Dry Areas (ICARDA).

Corresponding author: Meseret Tsige (m.tsige@cgiar.org)

About ICARDA
Established in 1977, the International Center for Agricultural Research in the Dry Areas (ICARDA) is a non-profit, CGIAR Research Center that focusses on delivering innovative solutions for sustainable agricultural development in the non-tropical dry areas of the developing world.

We provide innovative, science-based solutions to improve the livelihoods and resilience of resource-poor smallholder farmers. We do this through strategic partnerships, linking research to development, and capacity development, and by taking into account gender equality and the role of youth in transforming the non-tropical dry areas.

Address
Dalia Building, Second Floor, Bashir El Kasser St, Verdun, Beirut, Lebanon 1108-2010.
www.icarda.org

Disclaimer

Abstract

This working paper examines the extent to which socio-economists, plant and animal breeders, and plant pathologists in agricultural research centers understand and integrate gender issues into their research activities. A training program was then designed and conducted to enhance their knowledge on fundamental gender concepts, the role of gender in agricultural development, major gender approaches, research mechanisms, tools, gender needs, and impact assessments. The training employed an interactive learning methodology, including presentations, discussions, group work, and practical exercises.

Post-training assessments indicate that participants' understanding of gender concepts improved. Before the training, most participants had never conducted gender-sensitive agricultural research or integrated gender analysis into breeding activities. They acknowledged the lack of effort in incorporating women farmers' knowledge on crop diseases and their varietal preferences in Variety Verification Trials (VVT) and Participatory Variety Selection (PVS) sessions. Furthermore, Ethiopia's agricultural research centers were found to rarely consider women farmers' expertise in pest identification, variety verification, and selection as critical to agricultural development.

To address these gaps, participants developed action plans advocating for their research centers to systematically involve women farmers in plant disease identification and VVT/PVS sessions, particularly in the selection and release of improved lentil varieties. Additionally, socio-economist trainees committed to conducting gender analysis using sex-disaggregated data and gender-responsive sampling methods to inform plant and animal breeders about women farmers' specific needs. These steps aim to ensure that agricultural research more effectively supports gender-inclusive innovation and development.

Key words: Gender research and practice, training, women's knowledge on plant diseases, involving women farmers in VVT and PVS, agricultural research centers, Ethiopia.

Table of Contents

1. Introduction

Gender inequality is a recurring feature in Africa's agricultural production systems. Gender inequality causes lower rates of adoption of new agricultural innovations among women farmers (Beuchelt, 2016). Neverthless, agricultural extension systems, mainstream economics, and agricultural policies often assume a household as a unit made up of individuals working in similar ways to meet common goals under the direction of a male head (Evans, 1991). Studies, on the other hand, show that the household is a more complex and dynamic social entity which may change its composition and goals over time. Assuming the household as a single unit produces and sustains many gender issues that need to be addressed in developing countries like Ethiopia. Agricultural extension services, for instance, do not often reach out women farmers or women on the farm in Ethiopia (Tsige, Synnevåg, & Aune, 2020a). Gender norms and relations shape women's beneficiary status from commercial crops such as lentil in Ethiopia (Baada, Najjar, & Seifu, 2023). Policy makers typically assume that men are the farmers and women play only a "supportive role" as farmers' wives (Tsige, Synnevåg, & Aune, 2020b). Therefore, assuming women farmers as "economically inactive" in agricultural statistics, among policy makers agricultural innovation developers and assuming the household as a single unit with a unified need should be avoided and women farmers should be addressed as individual farmers in line with the problems they encounter and based on their own preferences, experiences and needs.

Furthermore, failure to understand gender differences often leads to inadequate planning, design, implementation of programs /initiatives/projects and innovations executed under them. Some agricultural programs even may contribute to the perpetuation of gender inequalities and may bring diminished returns on investments, may perpetuate social inequalities owing to exclusion of women farmers (Meinzen-Dick et al., 2011). Hence, understanding the challenges and opportunities encountered by women and men, as well as different types of women and men in different contexts and at different scales, are needed to address gender issues in agricultural programs/initiatives/projects.

Explicitly, agricultural programs/initiatives/projects should be designed to tackle strategic and practical gender needs in agricultural production, sale and consumption. They should establish strong linkages with farmers' associations, farmers cooperatives, women leaders, microcredit institutions, and agricultural banks to enhance the services available for women farmers (Ingutia & Sumelius, 2024; Lecoutere, 2017). Given to women's time poverty and triple gender roles, drudgery reduction technologies should be introduced and adopted (Vemireddy & Choudhary, 2021). Projects should help women get involved in enterprises with a focus on value addition (Ahairwe & Bilal, 2022). Clear and measurable outcome and impact indicators should be produced, and evidence must be presented for any claims that the program/initiative/project reports. Furthermore, agricultural projects that are implementing agricultural innovations should consult women and men farmers in sex-segregated communities to ensure that women and men's priorities and needs are integrated in designing and implementing agricultural innovations. Projects also need to use women farmers knowledge related to the selection of varieties, handling plant and animal diseases, when adopting new climate related innovations etc. They should also include female extension workers into innovations implementation discussions. Projects should also ensure that gender division of labor will not adversely affect women with new agricultural innovation introductions.

Together with Ethiopian Institute of Agricultural Research (EIAR) and Australian Center for International Agricultural Research (ACIAR), the International Center for Agricultural Research in the Dry Areas (ICARDA), conducted a training on ***gender research and practice in agriculture.*** The specific project funded the training is ***Protecting Ethiopian lentil crops*** which is primarily supported by ACIAR. The training attempts to help researchers in Ethiopia's agricultural research centers, integrate and address gender issues in the project and in their mainstream activities. Participants of the training are comprised of plant breeding technologists, plant pathologists, socio-economists and a livestock breeder. The research centers where participants are working are *Debre Berhan*, *Debre Zeit*, *Senana* and *Sirinka* agricultural research centers in Ethiopia.

The goal of the training is to enable participants integrate gender and address gender issues through protecting Ethiopian lentil crops project and in their mainstream activities. Specifically, the training intends to help participants integrate gender into the project, explain major gender approaches in research and practice, help participants obtain major gender research mechanisms, and help participants comprehend how to use gender research tools. Furthermore, attaining these objectives will help participants acquire scientific knowledge required to address gender needs when developing and releasing agricultural innovations for sustainable livelihoods.

2. Methods

Materials needed to deliver the training were prepared and developed. Published scientific articles and books were used to prepare the PowerPoint that was used to deliver the training. Twelve participants, among whom 2 women were participated. Professionally, 2 of them are plant breeding technologists, 4 are plant pathologists, 5 of them are socio-economists and 1 is a

livestock breeder. An interactive learning methodology was implemented where presentations, discussions, group work, interactive and practical exercises were conducted. Participants presented their plan on how to integrate gender and address gender issues in their work activities and into protecting Ethiopian lentil project. Before starting the training, participants were asked to fill out a pre and post training assessment survey.

3. Delivered contents

Basic concepts of gender in agriculture

Gender refers to the socially given attributes, roles, activities, relationships, and responsibilities linked to being a female or a male in each society whereas sex is the biological difference between men and women (Connell, 2009). Gender equality fundamentally means that women and men should have equal opportunities to realize their full human rights and equal potential to contribute to national and international economic, social and political development in all surfaces. Gender equity is a precondition for gender equality that recognizes the differentiated needs, realities and experiences of women and men.

Among the reasons why gender is important in agricultural development includes gender inequalities and inequities have often resulted in low productivity, income gains, sale, and consumption rates (Kabeer, 2021). Since gender roles and needs among men and women are different, there is a need to understand and prioritize gendered product trait preferences (Weltzien, Rattunde, Christinck, Isaacs, & Ashby, 2019). Furthermore, agricultural innovations may increase women's workload e.g., improved maize variety that is hard to thresh and does not resist weed infestation increases women farmers workload. Hence, breeders need to ensure equitable benefits for women and men by positioning their activities in accordance with women's roles, access to and control over resources when developing and implementing improved crop varieties and animal breeds.

Major gender approaches in research and practice

The gender sensitive approach acknowledges the negative consequences of not addressing gender inequalities. The gender responsive approach addresses gender-based barriers and responds to gender differences. The women empowerment approach empowers women through addressing their lack of agency, access to and control over resources. The intersectionality approach identifies and responds to many intersecting inequalities and factors (Crenshaw, 2017) that shape farmers capability to use agricultural innovations for food security, nutrition and livelihoods. The Gender Transformative Approach (GTA) provides scalable new knowledge for agri-food systems transformation (Hillenbrand, Karim, Mohanraj, & Wu, 2015) by changing social norms that sustain unequal gender power relations.

Major gender research mechanisms

Qualitative methodology designs are inductive and emerging that include case studies, grounded theory, narrative studies, action research designs etc. (Marshall & Rossman, 2014). Quantitative methodology designs are deductively investigated through hypothesis testing and involve descriptive, correlational, experimental, longitudinal etc. designs (Fischer, Boone, & Neumann, 2023). Mixed methodological designs include concurrent and sequential mixed method designs where both qualitative and quantitative data collection and analysis are employed (Clark & Creswell, 2008). Feminist methodological designs are those that primarily construct scientific knowledge using the voice of women (Harding, 2007).

Gendered research tools

Qualitative gendered research collects primary data using in-depth interviews, focus group discussions, observations and other tools (Rubin, 2016). Quantitative gendered research uses survey, experimental data, and document review tools to obtain data (Nardi, 2018). Mixed and feminist method designs use any of the qualitative and quantitative data collection tools.

Gender analysis (GA), which is another tool, investigates the different roles, responsibilities, assets and agency of men and women, including their differential access to, control over production inputs and use of natural, financial, social, political and infrastructure-related resources. Major questions to be asked in gender analysis involve who does what? When? Where? Who has what? Who decides and how? Who gains and who loses?

Gender analysis collects and organizes information about gender division of labor, makes women's work visible, distinguishes between access to and control over production resources and production outcomes. There are many types of GA tools that include Harvard, Moser, Longwe, GAM, Social relations etc. (March, Smyth, & Mukhopadhyay, 1999). The Harvard Analytical Framework, for instance, incorporates four specific tools: the activity profile, access to and control over

resources, influencing factors and checklist for project cycle analysis (March et al., 1999). The activity profile investigates gender roles performed by women and men. Access to and control over resources investigates who is accessing and who is controlling resources. Influencing factors are investigated by posing questions such as what are factors that limit project success? (norms? demography? institutional factors? political? etc.). Checklist for project cycle analysis asks contextual questions that are useful to identify what needs and opportunities exist to increasing women's productivity through increasing their access to and control over production resources.

Qualitative gender data analysis could be conducted using manual and software tools. Software tools are those such as NIVIVO, MAXQDA etc. Thematic analysis is an analytical tool and is a process of developing codes, categories, patterns in accordance with research questions and the data obtained using qualitative data collection tools. Narrative analysis is interpreting or presenting the direct words or stories of participants. Content analysis, on the other hand, is a process of analyzing the content of obtained data. Content analysis involves both conceptual and relational content. Conceptual content analysis determines the existence and frequency of concepts in a text, whereas relational analysis examines the relationships of concepts in a text (Krippendorff, 2018).

Quantitative gender data analysis could be conducted using SPSS, STATA, SAS, MINITAB, R etc., software tools by which it is possible to conduct both descriptive and inferential analytical techniques/tools. Gendered data could be analyzed using basic descriptive statistical techniques/tools such as measures of frequency, measures of central tendency and measures of dispersion. Inferential analytical tools for gendered data comprise t-test, z test, linear, nonlinear, logistic, multiple, etc. regressions. Regression analysis explains changeability in dependent variable by means of one or more of independent or control variables (Darlington & Hayes, 2016) and regression analytical tools are useful to acquire gender analysis outcomes as it discovers the extent of sample dispersion on the total population for generalizable knowledge outcomes required to inform gendered policies in agriculture.

Gender needs and impact assessments

Practical gender needs are responses to short-term and immediately perceived needs mainly arising from women's reproductive and productive roles (e.g., clean water, health care, housing food provision) (Moser, 1989). Addressing these needs does not challenge the subordinate position of women. Strategic gender needs are long-term needs arising from women's subordinate position of women (Moser, 1989). These needs are arising from women's subordinate position also challenges the nature of the gendered relationship between women and men. Addressing strategic gender needs leads to a transformation of gender inequalities (e.g., transforms access to resources, land, credit, etc.). Any agricultural project and agricultural innovations implemented under projects should identify and work towards fulfilling either practical or strategic gender needs based on their financial capacity.

Gender impact assessment (GIA) is an evaluation and analysis or assessment of programs, projects, initiatives, laws, policies, etc. GTA helps to avoid negative gendered consequences or inequalities emanated from. programs, projects, initiatives, laws, policies. GIA is also crucial for the development and distribution of socially responsible agricultural innovations and facilitates the scaling process of innovations (McGuire, Rietveld, Crump, & Leeuwis, 2022).

4. Post training results

Basic concepts of gender in agriculture

The training delivered basic concepts of gender in agriculture where contents addressed under this theme include what is gender? Why is gender important to achieve agricultural development goals? challenges women farmers are facing in crop and animal farming, extension assumptions and their implications on women farmers, and how to address gender issues in agricultural programs. For the question that was asked if they have ever attended gender training in the pre training assessment, 67% of them responded that they have never attended gender training. The post training assessment shows 58% of them have improved their knowledge on gender issues that exist in agriculture in general and in Ethiopia's agriculture in particular which thereby confirms that the training increased their basic knowledge on gender issues in agricultural research and practice.

Major gender approaches in research and practice

Major gender approaches including gender sensitive, gender responsive, women empowerment, gender mainstreaming, practical and strategic gender needs, gender transformative and intersectionality have been presented and discussed. The pre-training assessment finds that 66% of participants' knowledge status on gender issues in agricultural practice is good. According to their response, 83% of them are now capable of addressing gender issues in their work plan using gender approaches and practices which could be considered as a success obtained from the training.

Gender research mechanisms

The training presented and raised discussion points on major gender research mechanisms where participants were actively engaged. Major gender research mechanisms discussed comprise qualitative methodology, quantitative methodology, mixed methodology and feminist methodological mechanisms. Pre training assessment finds that all of them (100%) have never conducted exclusively focused or solely staged gendered research. The post assessment finding, in contrast, confirms that 58% of them have developed skills to conducting gender research owing to the training which could be considered as a success gained from the training.

Gender research tools

The training addressed gender research tools that covered data collection tools, data analysis tools, gender analysis tools, gender needs assessment and gender impact assessment tools. The pre training assessment finds that 100% of them never conducted a gender analysis in their entire work experience. After the training 50% of them responded good to the question that investigated if they have developed a gender analysis skill from the training and 42% of them selected very good for the same question. Although they are not expected to develop complete gender analysis skills with such a short-term training, the training relatively improved their knowledge on how to conduct gender analysis.

Group work

In groups of two, Step 1. take ten minutes to provide an overview of each of the programs that are going on in your center and some activities in detail (what are you doing, with whom, what have you achieved, and what are the evidence of these outcomes) and Step 2. present back to plenary Step 3. In ten minutes back to the groups, discuss: what types of gender approaches, mechanisms and tools do you see being used? Step 4: present to plenary, present your plan on how to integrate and address gender issues in your activities.

Participants plan to integrate and address gender issues

Participants presented their plan on how to integrate and address gender issues in their activities in general and into protecting Ethiopian lentils project in particular. Group one which was dominated by socio-economists presented that the baseline survey that they conducted under protecting Ethiopian lentils project included 900 farmers where only 7% of them were women farmers. To compensate for the problem, they presented their plan that they will in the future identify and address gender issues through including women farmers in future research, farmers field days, reports and publications. Socio-economist trainees also presented their plan to conduct gender analysis and gender research using sex disaggregated or gendered equal sample variances. Since they are working in agricultural research centers, they are hoping that they will conduct exclusive gender research and gender analysis that will provide data to breeders to enable them address women farmers needs in their breeding works. They also presented their plan to work towards involving women farmers in lentil value addition, sale and consumption. Same group also presented that they have not been able to involve women farmers knowledge and preferences in Variety Verification Trails (VVT) and Participatory Variety Selection (PVS) to date. They mentioned that there is no such an

opportunity in VVT and PVS systems in Ethiopia's agricultural research centers and they plan to insist the idea that is considering women farmers knowledge in such trails and when varieties be crossed and released from their respective research centers.

Group two participants presented that although "participatory plant breeding" is expected to involve women and men farmers and researchers on an equal basis, it does not often involve both women farmers and researchers. Women farmers are not considered as knowledge holders and the number of women plant breeders in their respective centers are very small or almost absent. Furthermore, variety development, on farm verification and pest identification processes do not involve farmers knowledge in general and women farmers knowledge in particular. VVT and PVS processes not only neglect women farmers knowledge but also their preferences in improved crop developments and releases which is also true for lentil varieties released. Group two participants presented their plan that is they will initiate women farmers involvement in VVT and PVS processes. They also planned to work towards breeding lentils and other crops by considering women farmers knowledge and preferences.

Follow up recommendations

Provision of consecutive trainings on how to address gender issues in using agricultural innovations, incorporation of women farmers knowledge and experience in lentil/any crop variety selection, breeding, and verification processes before release, breeding lentils/other crops in accordance with women farmers gendered preferences, using women smallholders' knowledge when identifying crops/lentil diseases, using equal variances of sex or sex disaggregated data when researching corps/lentil producers, helping women crops/lentil producers to improve value addition and sale by linking them with microfinance cooperatives, increase women farmers consumption of lentils through nutrition education are some of the recommendations trainers provided to reduce gender issues and to make women farmers beneficiaries from improved lentil varieties.

5. References

Ahairwe, P., & Bilal, S. (2022). *AgrInvest-Food Systems Project–Leveraging private finance for sustainable agrifood value chains in Burkina Faso, Ethiopia, Kenya and Niger*. Rome: Food & Agriculture Org.

Baada, J. N., Najjar, D., & Seifu, M. H. (2023). Can a cash crop be a women's crop?: Examining gender norms, relations and equity around lentil commercialization in Ethiopia. *Scientific African, 21*, e01862.

Beuchelt, T. D. (2016). Gender, social equity and innovations in smallholder farming systems: Pitfalls and pathways. *Technological and institutional innovations for marginalized smallholders in agricultural development*, 181-198.

Clark, V. L. P., & Creswell, J. W. (2008). *The mixed methods reader*: Sage.

Connell, R. (2009). *Gender* (Vol. 14): Polity.

Crenshaw, K. W. (2017). Race, reform, and retrenchment: Transformation and legitimation in antidiscrimination law. In *Law and social movements* (pp. 475-531): Routledge.

Darlington, R. B., & Hayes, A. F. (2016). *Regression analysis and linear models: Concepts, applications, and implementation*: Guilford Publications.

Evans, A. (1991). Gender issues in rural household economics. *IDS bulletin, 22*(1), 51-59.

Fischer, H. E., Boone, W. J., & Neumann, K. (2023). Quantitative research designs and approaches. In *Handbook of research on science education* (pp. 28-59): Routledge.

Harding, S. (2007). Feminist standpoints. *Handbook of feminist research: Theory and praxis*, 45-69.

Hillenbrand, E., Karim, N., Mohanraj, P., & Wu, D. (2015). Measuring gender-transformative change: A review of literature and promising practices. *CARE USA. Working Paper*.

Ingutia, R., & Sumelius, J. (2024). Does cooperative membership facilitate access to credit for women farmers in rural Kenya? *Journal of Agriculture and Food Research, 18*, 101425.

Kabeer, N. (2021). Gender equality, inclusive growth, and labour markets. In *Women's Economic Empowerment* (pp. 13-48): Routledge.

Krippendorff, K. (2018). *Content analysis: An introduction to its methodology*: Sage publications.

Lecoutere, E. (2017). The impact of agricultural co-operatives on women's empowerment: Evidence from Uganda. *Journal of Co-operative Organization and Management, 5*(1), 14-27.

March, C., Smyth, I. A., & Mukhopadhyay, M. (1999). *A guide to gender-analysis frameworks*: Oxfam.

Marshall, C., & Rossman, G. B. (2014). *Designing qualitative research*: Sage publications.

McGuire, E., Rietveld, A. M., Crump, A., & Leeuwis, C. (2022). Anticipating gender impacts in scaling innovations for agriculture: Insights from the literature. *World Development Perspectives, 25*, 100386.

Meinzen-Dick, R., Quisumbing, A., Behrman, J., Biermayr-Jenzano, P., Wilde, V., Noordeloos, M., . . . Beintema, N. (2011). *Engendering agricultural research, development and extension* (Vol. 176): Intl Food Policy Res Inst.

Moser, C. O. (1989). Gender planning in the third world: Meeting practical and strategic gender needs. *World Development, 17*(11), 1799-1825.

Nardi, P. M. (2018). *Doing survey research: A guide to quantitative methods*: Routledge.

Rubin, D. (2016). *Qualitative methods for gender research in agricultural development* (Vol. 1535): Intl Food Policy Res Inst.

Tsige, M., Synnevåg, G., & Aune, J. B. (2020a). Gendered constraints for adopting climate-smart agriculture amongst smallholder Ethiopian women farmers. *Scientific African, 7*, e00250.

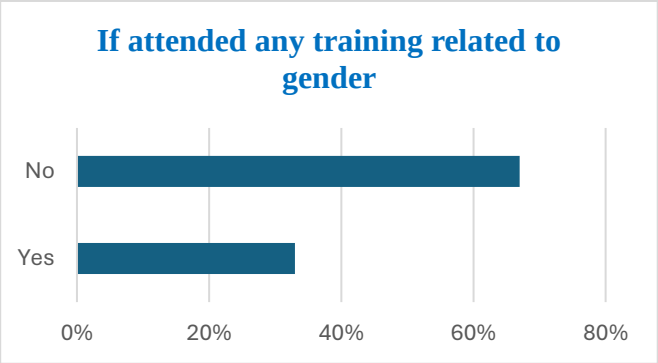
Tsige, M., Synnevåg, G., & Aune, J. B. (2020b). Is gender mainstreaming viable? Empirical analysis of the practicality of policies for agriculture-based gendered development in Ethiopia. *Gender Issues, 37*, 125-152.

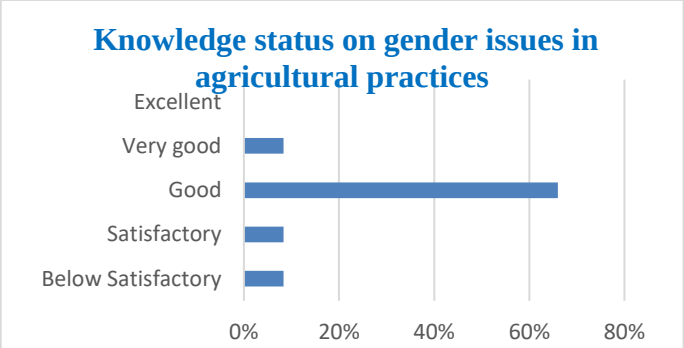
Vemireddy, V., & Choudhary, A. (2021). A systematic review of labor-saving technologies: Implications for women in agriculture. *Global Food Security, 29*, 100541.

Weltzien, E., Rattunde, F., Christinck, A., Isaacs, K., & Ashby, J. (2019). Gender and farmer preferences for varietal traits: evidence and issues for crop improvement. *Plant breeding reviews, 43*, 243-278.

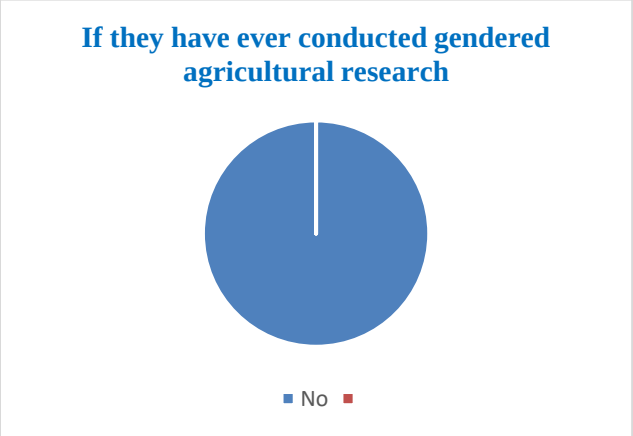
6. Appendix

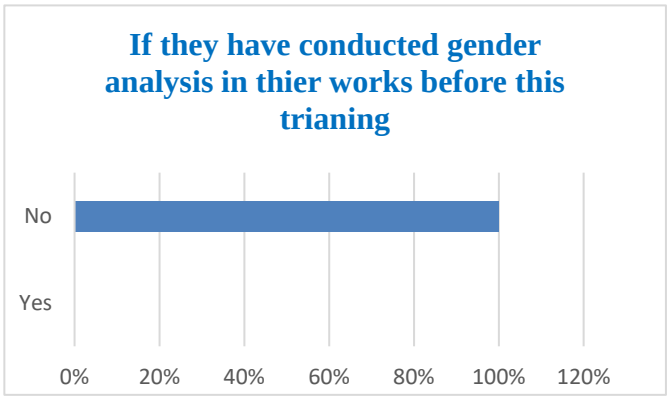

Evaluation of thier knowledge on gender issues in agricultural research after the training
100%
50%
0%
Good
Very good
Excellent


If attended any training related to gender
No
Yes
0%
20%
40%
60%
80%

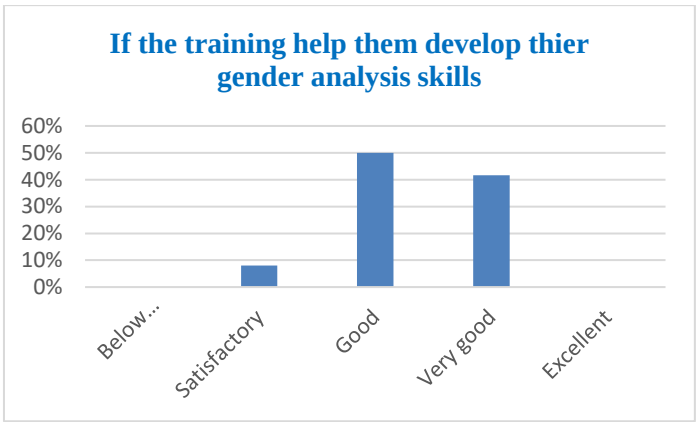

Knowledge status on gender issues in agricultural practices
Excellent
Very good
Good
Satisfactory
Below Satisfactory
0%
20%
40%
60%
80%


If the training help them develop skills to addressing gender issues in thier future work plan
100%
50%
0%
Good
Very good
Excellent


If they have ever conducted gendered agricultural research
No


If they have conducted gender analysis in thier works before this trianing
No
Yes
0%
20%
40%
60%
80%
100%
120%


Evaluation of thier skills to conducting gender research after the training
80%
60%
40%
20%
0%
Good
Very good
Excellent


If the training help them develop thier gender analysis skills
60%
50%
40%
30%
20%
10%
0%
Below...
Satisfactory
Good
Very good
Excellent


ILRI
Livestock
for women

ICARDA

Science for resilient livelihoods in dry areas