



Women in Science

The number of women pursuing careers in the field of science is on the rise^{1,2}. Women remain, however, a significantly smaller proportion of scientists around the world; their male colleagues are estimated to constitute more than 70% of those working in research and experimental development. With this issue of *Science Impacts*, ICARDA wishes to encourage more women to pursue a scientific career. The issue also showcases ICARDA's business case which justifies the importance and recognizes the value of increasing women's participation in research. It identifies specific approaches to attract and retain more female scientists³.

Today, most female researchers are found in Central Asia (48.1%), and Latin America and the Caribbean (45.4%), while fewest are recorded in South and West Asia (18.5%). North America and Western Europe are slightly above the global average with around one in three scientists (32.3%) being women⁴. However, these statistics do not show the leadership level or type of work carried out by female scientists. Such considerations are pertinent as "Increases in the representation of women in leadership roles are important for recruiting and providing role models for women earlier in their careers and for bringing diverse perspectives to strategic decision-making"⁵.

Studies have tried to find out what keeps women from pursuing a career in STEM – the fields that cover Science, Technology, Engineering and Mathematics⁶. Explanations of "social belongingness"⁷ are proposed in some analyses, with gender stereotypes influencing the choices of girls

and women who as a result turn to HEED subjects in the Health, Elementary Education and Domestic spheres.

Although more than half (53%) of bachelor's and master's degree holders around the world are female, the number declines to 44% of PhD graduates and 28% at the level of researcher⁸. In agriculture, the number of women professionals is growing. This is also true of graduates in agricultural sciences from research universities in ICARDA's target countries, where women constitute over 50% of graduates⁹.

A study suggests that the prevalence of female scientists in developing countries can be explained by the fact that "women in countries with higher gender inequality are simply seeking the clearest possible path to financial freedom. And often, that path leads through STEM professions"^{10,11,12}.

Committing to SDG5

Goal 5 of the 17 Sustainable Development Goals (SDGs) commits to “Achieve gender equality and empower all women and girls”. Working towards the 2030 goals, ICARDA recognizes the importance and value of more equity and inclusiveness among its employees as well as in the scope of research for development – within the organization and among its national partners.

The above is reflected in ICARDA's 2017–2026 strategy, which focuses on mainstreaming the role and inclusion of youth, enhanced gender equity, along with a continuous and significant investment in capacity development, in its approach to cutting-edge science and research for development. This commitment also puts the organization in a proactive position to continue to create enabling environments, with inclusive family policies and support intended to better allow male and female scientists to pursue their careers.

ICARDA builds the capacity of men and women in the Middle East, North Africa, Sub-Saharan Africa, East Asia, and Central Asia, where the organization is present and works in partnerships with National Agricultural Research Systems and educational institutions.

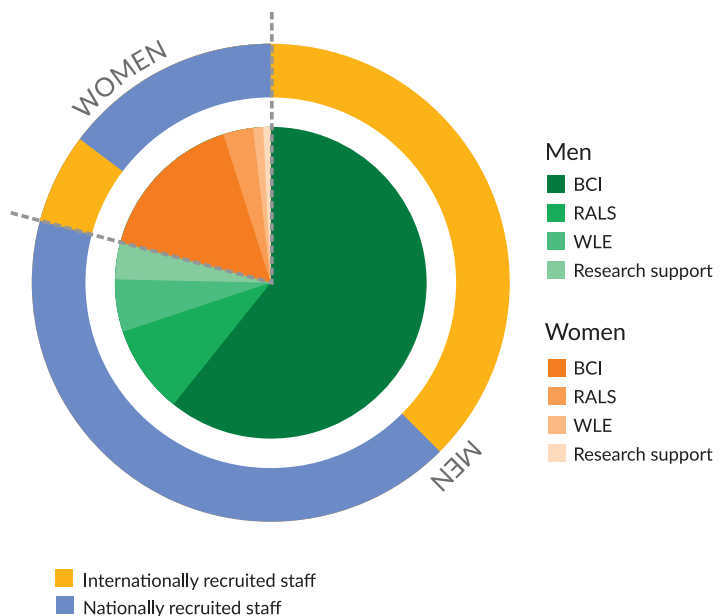
Gender inclusion and diversity can help unlock the potential for science-based solutions and enhanced resource management¹³. This is critical in the context of development efforts in the drylands where ICARDA works to improve livelihoods and build resilience to the effects of climate change among male and female smallholder farmers.

ICARDA research programs

- **Biodiversity and Crop Improvement (BCI):** conserving germplasm and harnessing advanced crop science to breed climate-resilient crops.
- **Resilient Agricultural Livelihood Systems (RALS):** building integrated crop–livestock farming systems that optimize economic, social, and environmental conditions.
- **Water, Land and Ecosystems (WLE):** supporting the sustainable use of water and land resources through rain-fed, irrigated, and agro-pastoral farming.

These research programs include a comprehensive technical and research support system, with scientific expertise in the fields of capacity development, Geoinformatics and Big Data, as well as monitoring, evaluation, and knowledge management (mel.cgiar.org).

Figure 1: Distribution of male and female researchers at ICARDA



¹ <https://blogs.thomsonreuters.com/answerson/business-case-for-diversity/>
² https://www.huffingtonpost.com/entry/the-business-case-for-gender-diversity-update-2017_us_590658cbe4b05279d4edbd4b
³ <http://repo.mel.cgiar.org/handle/20.500.11766/5960>
⁴ <http://uis.unesco.org/en/topic/women-science>
⁵ <http://iea.cgiar.org>
⁶ <https://www.tandfonline.com/doi/full/10.1080/0194262X.2017.1371658>
⁷ <https://www.theguardian.com/science/head-quarters/2018/mar/08/bridging-the-gender-gap-why-do-so-few-girls-study-stem-subjects>

⁸ <http://uis.unesco.org/en/news/women-are-missing-ranks-higher-education-and-research>
⁹ <http://repo.mel.cgiar.org/handle/20.500.11766/5960>
¹⁰ <https://journals.sagepub.com/doi/10.1177/0956797617741719>
¹¹ <https://www.elsevier.com/connect/what-it-means-to-be-a-woman-in-science-in-the-developing-world>
¹² <https://www.theatlantic.com/science/archive/2018/02/the-more-gender-equality-the-fewer-women-in-stem/553592/>
¹³ <http://science.sciencemag.org/content/330/6004/686>

Voices of Women in Science – Q&A with ICARDA and affiliates

How did the support from ICARDA benefit you in the advancement of your science career?

In your opinion how can we improve the representation of women in science?



A: From my experience with training young scientists in the application of GIS technologies in agriculture, it seems that the representation of male and female researchers respectively depends on the place where they study and work. I believe that women should have equal opportunities to represent their work places

and to share their ideas and studies. Research of high quality should be supported, acknowledged, and published. Improving the representation of female researchers at universities and research centers in their own countries will eventually improve the representation of women globally.

Layal Atassi – from Syria

*GIS lab manager, Geoinformatics unit
ICARDA, Cairo, Egypt*

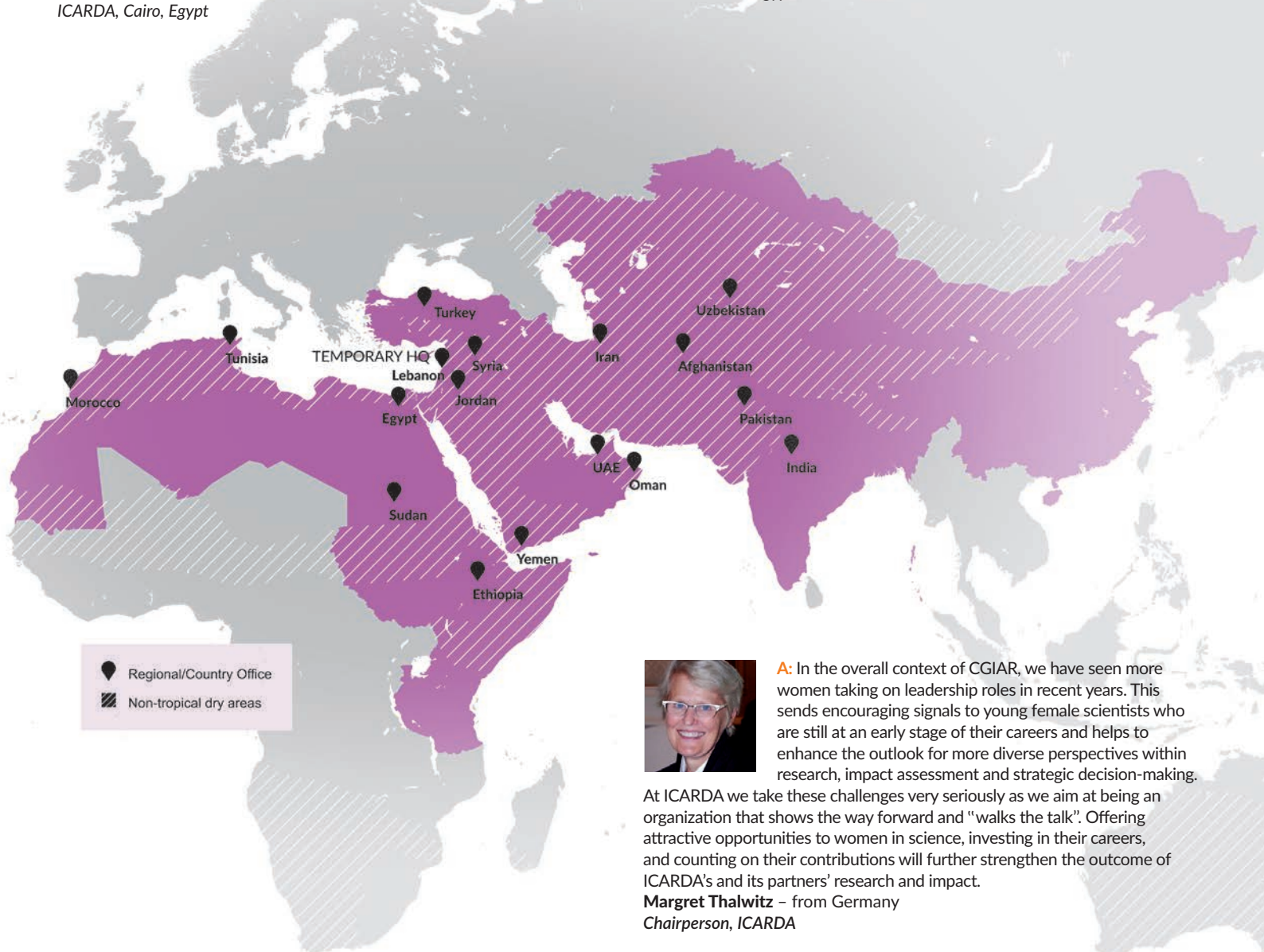


A: We are now seeing more women, especially in some fields of study – than men. Usually the challenge is retaining them in science which in most cases requires long working hours, including weekends. For this, I think offering flexible working hours would go a long way in allowing women to find the right balance between work and family, and to

meet the publication demands to survive in the “publish or perish” modus operandi. Highlighting female role models who are thriving in the system is also good to encourage young women to aspire and believe in the possibility.

Bezait Dessaegn – from Ethiopia

*Social sciences specialist, WLE
ICARDA, Cairo, Egypt*



A: In the overall context of CGIAR, we have seen more women taking on leadership roles in recent years. This sends encouraging signals to young female scientists who are still at an early stage of their careers and helps to enhance the outlook for more diverse perspectives within research, impact assessment and strategic decision-making.

At ICARDA we take these challenges very seriously as we aim at being an organization that shows the way forward and “walks the talk”. Offering attractive opportunities to women in science, investing in their careers, and counting on their contributions will further strengthen the outcome of ICARDA’s and its partners’ research and impact.

Margret Thalwitz – from Germany
Chairperson, ICARDA



A: This raises even more questions to explain for example why most students on university courses on agriculture science are women, who are later poorly represented in the research domain? Surely making job conditions more attractive to women – time management, career development and opportunities – can influence better equity in the field of science.

Véronique Alary – from France
Researcher in rural economy, RALS
ICARDA, Rabat, Morocco



A: Development actors are increasingly focusing on women as beneficiaries in projects at local and global levels. Today, it is understood that women are key to rural development and having female staff on board can facilitate increased understanding of gender norms and needs, and create access to female farmers particularly

in rural, traditional cultures. It is also important to ensure that female staff are of diverse backgrounds, especially from the developing world. Research clearly documents that companies which mirror their clients are more likely to succeed in delivering for these clients.

Dina Najjar – from Lebanon
Gender specialist, RALS
ICARDA, Rabat, Morocco



A: ICARDA gave me the opportunity to research in diverse climatic conditions and collaborate with scientists from different fields. This is beneficial for generating new knowledge, ideas, and expertise to advance my career in agricultural science.

A: Look at the needs of female scientists: young girls and early career scientists must find a positive environment at all levels through good mentors, support from family, society, and friends. Later, women's scientific careers can be encouraged by women-friendly working environments, maternity leave, work-life balance, and possibilities for family togetherness. Treating female scientists fairly and valuing their work will pave the way to leading positions.

Mina Devkota Wasti – from Nepal
Agronomist, RALS
ICARDA, Rabat, Morocco



A: I see that ICARDA is taking steps to create a more welcoming environment for female scientists with better maternity leave etc. It is also important to be vocal about what needs to be done to retain more females in science after graduation and how to support their career development. Transparency of selection and appointment

procedures and practices at all levels of scientific positions is critical to bridge gender gaps. Employers should also encourage a work-life balance and support women by offering part-time research opportunities. Childcare facilities inside the organization would be a great advantage.

Inaam El-Miziani – from Morocco
Senior research assistant, BCI
ICARDA, Rabat, Morocco



A: Ask yourself!
Stefanie Christmann – from Germany
Senior scientist, Environmental management, Farming with alternative pollinators, BCI
ICARDA, Rabat, Morocco



A: ICARDA offered me several opportunities – from great availability of researchers and support personnel, to a scholarship that not only covered expenses but also granted me intellectual experiences and necessary skills.

A: To understand what it takes to improve the representation of women in science we need to identify and be aware of the costs and inconveniences they face. In particular, young female scientists can benefit from research grants to encourage them to present their work at scientific conferences and focus on publishing articles.

Karima El-Kabous – from Morocco
PhD student, Legumes and cereals – food technology and quality
ICARDA/INRA, Morocco



A: ICARDA supported my PhD and I have been involved in projects since 2002 through collaborative crop improvement and scaling programs on barley for Tunisia. Our research station, lab facilities, and workshop events have been supported and I have been able to travel and present our work abroad with ICARDA.

A: Despite positive trends, female researchers and inventors are still underrepresented and often occupy less influential positions. Reforms could be made at all levels to achieve gender equality, for example through more transparency in the recruitment process, engaged academic leadership, and measures to create a welcoming environment for women, looking at issues such as maternity leave and work-life balance.

Hajer BenGhanem – from Tunisia
Barley breeder, Barley breeding program, Field crop laboratory
Institut National de la Recherche Agronomique de Tunisie (INRAT), Tunisia



A: ICARDA knowledge benefitted my PhD process, the quality of my science research and overall work. It also exposed me to the international scientific sphere through participation in meetings and conferences. ICARDA partly funded my lab work (purchase of kits, sequencing DNA etc.), publications fees, and participation in international conferences.

A: Achievements at all levels of women's science career should be promoted widely highlighting their role in field work and as authors or co-authors in peer-reviewed publications. Research centers and universities should have a quota for the recruitment of women scientists. In developing countries, this would reward more female students undertaking postgraduate studies.

Mariem Rouatbi Ep Bouzouita – from Tunisia
PhD, Laboratory of parasitology
Ecole Nationale de Médecine Vétérinaire, Sidi Thabet, Tunisia



A: If employers would recruit more women for top administrative and decision-making posts and invest in scientist women as program leaders, and postdoctoral positions, that would help retain more talented women in scientific research.

ICARDA needs to engage young girls in research activities and make them aware of the novel, exciting opportunities of this field. They also need to know of the challenges, support them and involve them in the meetings, and open the door for them to attend conferences, and publish written scientific papers in visible journals. ICARDA needs to find new ways of evaluating the performance and scientific potential of women scientists.

Fida Alo – from Syria
Research associate, genetic resources section, Biotechnology, BCI
ICARDA, Cairo, Egypt



A: ICARDA provided the facilities to learn new types of research work in biotechnology which we don't have in Sudan. It was a great support to complete my PhD study.

A: There must be equality and equity for female scientists to get opportunities to have scholarships, grants, and training, as well as to be leading groups, be involved in planning, and supported to publish and travel.

Noha Abdel Wahab Mohamed Ahmed – from Sudan
*Prof. assistant, Plant pathology, BCI
 Agricultural Research Corporation (ARC), Khartoum, Sudan*



A: Collaboration, mentorship, and inspiration are key. Women only, discipline-specific online portals may be useful to promote female role models, discover and access expertise of women, and offer opportunities for collaborations among women in the same or similar career cluster.

Jane Ambuku-Wamatu – from Kenya
*Small ruminant nutritionist, RALS
 ICARDA, Addis Abeba, Ethiopia*



A: Women and girls' education and training is very important to be able to compete at all levels and in all scientific fields. In addition, treating female researchers more fairly is an important step to keep women interested in science.

Safaa Kumari – from Syria

*Head of seed health lab, plant virologist, BCI
 ICARDA, Terbol, Lebanon*



A: It is 25 years ago that my father was criticized for selling a plot of land to pay the university tuition of a girl. And 20 years ago, in my first job, my supervisor was a woman who insisted during my hiring process that an agricultural field research assistant, working in rural areas, "does not need to be a man". These two milestones

were reached because implicit biases were actively recognized and removed, making conditions more equitable for a woman in education, and more transparent in recruitment. This is necessary and sufficient to improve women's representation in science.

Mariana Yazbek – from Lebanon
*Gene bank manager, BCI
 ICARDA, Terbol, Lebanon*



A: First, general conditions must be improved at each work place. Employers can also share experiences and promote female role models who have successfully balanced career and family life. Such role models can mentor individual researchers and support networks. A good work environment is dependent on the equality

of men and women in terms of selection of candidates for jobs, equal salaries, and involvement in conferences. On a practical note, having childcare facilities at the workplace would be an advantage for many female researchers.

Sawsan Tawkaz – from Syria
*Coordinator biotechnology and plant cell culture, Biotechnology, BCI
 ICARDA, Terbol, Lebanon*



A: ICARDA has offered me scientific, logistic, and publishing support during a recent research project among Syrian refugees and host communities in Lebanon. Working with experienced scientists has truly enriched my professional career and increased my knowledge and skills.

A: Employers should earmark fellowships for women and commit to equitable employment opportunities and wages. Positions and payments should be kept during proper maternity leave arrangements. In general, more focus on the importance of women in science is needed through for example ICARDA and partner events, media, and publishing. Finally, any discrimination, criticism, or abuse based on gender should be sanctioned.

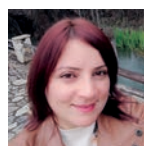
Saja Al Zoubi – from Syria
Former research fellow at ICARDA/TWAS, Lebanon



A: I have been lucky to benefit from ICARDA during my PhD as this was initiated when I was already an employee. It was possible for me to combine my research with my existing job as my supervisor was very supportive in the process, accepting that the PhD work was a priority.

A: We need a work environment with job security and a strong gender focus that is conducive to both male and female scientists whether in the organization or during events and meetings. ICARDA also needs a non-degree capacity development program to attract new people. A staff association that has the power to defend women's rights would also be helpful.

Sawsan Hassan – from Syria
*Research associate, Coordinator – forage systems, SIRPS natural resource management, RALS
 ICARDA, Amman, Jordan*



A: My work week is normally 60 hours and often includes weekends and traveling. As women, we can surely handle many tasks at the same time – professionally, in a family context, and other life issues. But to improve our representation in science, more flexible time for work and family care is critical.

Rewarding women financially will also enable us to invest in solutions and support at home to free time for writing scientific papers and reports. I also think that women should be favored to ensure female researchers' participation in trainings and educational experiences, and be involved in corporate decision making.

Mira Esaaf Haddad – from Jordan
*Senior research assistant, spatial analysis and database management, WLE
 ICARDA, Amman, Jordan*



A: I was involved in ICARDA's "Lentil Biofortification project" for 6 years as a PhD student and published my three research papers in peer-reviewed journals. ICARDA gave me the opportunity to work on biofortification for enhancing the grain iron and zinc in lentil which can help in eradicating global micronutrient malnutrition.

A: More fellowships for female scientists are needed at the initial level of their career, to bring financial and professional stability. Having a fixed percentage of women in jobs will encourage and motivate women to work alongside men and create more equity.

Akanksha Singh – from India
*PhD research scholar
 Indian Agricultural Research Institute (IARI), New Delhi, India*

ICARDA's business case for gender diversity

Gender diversity is smart business. It strengthens the capacity of a research organization to attract funding and creativity, increase innovation and impact, and to cater to female clients.

The Diversity and Inclusion Index powered by Thomson Reuters reveals that top scoring companies also have the highest financial returns. Gender balance in staffing is an important aspect of diversity. Business teams with an equal gender mix and especially those with women in leadership positions out-perform male-dominated or female-dominated teams in profit, creativity, and accountability. Gender equity considerations in staffing are also important for achieving the Sustainable Development Goals which have gender equity as both an explicit and cross-cutting objective.

Promoting gender equity

As demographics for professionals in agricultural sciences evolve with a notable increase in women's participation, organizations working in this field should proactively seek to achieve gender equity among their science staff. They can capitalize on readily available expertise to avoid a lost opportunity and an underutilization of existing talent.

Female clients constitute an important focus of development agencies. Having female staff facilitates an increased understanding of and access to female farmers' needs and aspirations. Female scientists are able to reach female clients to develop contextualized knowledge, technology, and solutions that serve their needs and avoid those that do not. It is also important to ensure that female staff are of diverse cultural backgrounds. Organizations which mirror their clients are more likely to succeed in delivering for these clients. Institutions with gender inclusive cultures have lower staff-turnover rates and better retention. Furthermore, hiring women contributes to an overall economic growth in the GDP of local economies. Hence, gender diversity benefits everyone from internal teams to the broader economy.

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He for She

One powerful example is the *He for She* campaign initiated by the United Nations in 2014. It has gender equality as its goal and takes action against negative stereotypes and behaviors by actively involving men in promoting equity. Within the initiative male university professors are working actively to promote female scientists, knowing that gender inequality is an issue that affects all people economically, socially, and politically. Along the same lines, ICARDA is committed to this goal both externally and internally through staffing, policies related to working conditions, projects, and capacity development programs.

A number of actions have already been taken by ICARDA to ensure relevant practices and policies that can help translate visions into tangible action and impact. This includes a Gender and Inclusion Action Plan involving interventions at various levels – from ensuring that corporate language is free of gender or other types of biases, to developing skills and behaviors, and effectively dealing with gender issues, harassment, discrimination, and unconscious bias. Encouraging signs in recent recruitments have already been seen, showing impact on staff composition with increased representation of female employees at all levels in ICARDA, including more women in science.



Photo by: Dagnachew Welde Giorgis

Cover photos by: Dagnachew Welde Giorgis (left); Alexandra Holm (right)

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