BREAKING BARRIERS
BUILDING BRIDGES

A Southern-led research network to advance gender equality in STEM

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CONTENTS

EXECUTIVE SUMMARY

The **Breaking Barriers Network**, supported by the International Development Research Centre (IDRC), is an investment to dismantle the systemic and systematic barriers that hinder women's participation and leadership in STEM (Science, Technology, Engineering, and Mathematics) fields, particularly in the Global South. This report synthesizes the findings and impacts of various projects that make up this network, underscoring the critical importance of evidence-informed policies and interventions to drive progress towards gender equity in STEM.

In recent years, awareness of gender inequities in STEM has grown significantly, with an acknowledgement of the entrenched forces driving these inequities. However, much of the research, data, and tested interventions addressing these have originated from the Global North. There remains a notable gap in evidence-based strategies and interventions specifically piloted to tackle the barriers women face in progressing and succeeding in STEM fields and industries in the Global South. The initiatives and recommendations presented in this publication aim to bridge this gap, providing insights to inform future initiatives and policy development. They advocate for a comprehensive approach to fostering a more inclusive and equitable STEM landscape.

Research emerging from the **Breaking Barriers Network** spans across Latin America and Africa, encompassing projects that address various challenges to women's participation and leadership in STEM, often focusing on specific STEM disciplines or target institutions where they hope to see change. The project teams that make up the network have developed evidence-based strategies, established collaborative networks, and influenced policy changes to support gender equality in STEM. Bringing Southern perspectives, context-specific interventions and evidence-based policies, the network has co-created a global research agenda, carving a path forward.

> Achieving gender equity in STEM requires a multifaceted approach involving multiple stakeholders, across levels of impact and change. The Breaking Barriers Network demonstrates the potential for impactful change through targeted interventions and collaborative effort, but more is still needed to achieve lasting changes to institutions and the broader science system.

What have we learned so far?

Our researchers have highlighted the effectiveness of comprehensive programs that combine educational interventions with organizational learning processes. These programs address barriers at multiple levels and create supportive environments for women. Participatory research methods have been particularly valuable, ensuring that women's perspectives are included and addressed, leading to more gender-sensitive research approaches.

Mentorship and role models have emerged as crucial elements for inspiring and supporting young women and early career scientists in STEM. Initiatives that provide mentorship and highlight female role models help combat negative stereotypes and promote broader social and gender equity goals. Effective policy integration and implementation into these initiatives have also been essential for supporting women's inclusion in leadership roles within STEM fields.

Community engagement and education have been key to addressing cultural and social barriers. Programs that involve community members and address traditional norms have been effective in promoting gender equality and supporting women's participation in STEM. Transformative learning approaches, which focus on changing beliefs, attitudes, and behaviors, have been necessary for creating lasting change and promoting gender equity in STEM fields.

Recommendations

Achieving gender equity in STEM requires a multifaceted approach involving multiple stakeholders, across levels of impact and change. The **Breaking Barriers Network** demonstrates the potential for impactful change through targeted interventions and collaborative effort, but more is still needed to achieve lasting changes to institutions and the broader science system. Sustaining and scaling these efforts necessitates involving policymakers and key stakeholders from the outset to ensure lasting impact. There is a need to continue to build on these foundations and expand successful programs.

To move forward, it is essential to increase the visibility of women scientists through media campaigns and educational materials, expand outreach and mentorship activities, and combat entrenched systemic and systematic barriers with gender-sensitive policies and campaigns. Providing incentives and scholarships to support girls and women in STEM studies, developing interactive and equitable learning environments, and conducting gender audits and developing mainstreaming strategies are also crucial steps to see lasting change to educational and science institutions.

Adopting a multi-stakeholder approach to improve women's participation in STEM, implementing national and institutional policies promoting STEM education and gender equity, supporting advocacy groups, and enhancing policy awareness and participation are necessary to create a supportive environment for women in STEM. Improving data collection and analysis to inform policy interventions will ensure that efforts are targeted and effective.

INTRODUCTION

The importance of women's participation and leadership in STEM

A chieving gender equality in science is not only a moral imperative but also crucial for advancing scientific innovation. The underrepresentation of women in science deprives the field of diverse perspectives and limits the development of multifaceted solutions. For instance, in many developing countries, women are primarily responsible for water collection. Involving them in water management projects ensures solutions that reflect their needs and lived experiences. Despite this, women's participation in research and leadership within the water sector remains minimal (UNESCO, 2021). Historically, the male-dominated field of medical research has overlooked crucial sex differences in medicine. However, the inclusion of women in this field has been transformative, leading to groundbreaking scientific discoveries that significantly enhance women's health and well-being (Kozlowski et al., 2022).

In various forms of media, such as those that highlight the often-overlooked contributions of women in STEM, we observe that gender disparities in recognition and opportunity are a widespread issue. For instance, many women have made critical contributions to significant scientific advancements, yet their achievements have frequently been undervalued due to gender biases. This pattern of systemic erasure of women's accomplishments in science is a global phenomenon. Women scientists around the world, including those in the Global South, continue to face substantial challenges and barriers due to their gender and the socio-political environments in which they work (OECD, 2020).

The gender gap in STEM is not a result of individual choices but is shaped by systemic barriers, including gender biases, stereotypes, and structural inequalities within educational institutions and workplaces (UNESCO, 2021). Uncovering and addressing these barriers is a necessary step in driving development around the world.

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THE GLOBAL CONTEXT

Challenges and opportunities identified through past work and investments

Significant progress has been made in highlighting the lack of gender equality in STEM fields, yet non-diverse science and technology sectors remain the norm. According to UNESCO's 2024 report on the gender gap in science, women represent only a third of researchers globally, with even lower representation in leadership roles and senior positions—a statistic that has remained almost unchanged in the past decade. Data on other marginalized groups is often unavailable or unrecognized.

The lack of diversity in science, technology, and innovation sectors has significant economic consequences. Studies show that diverse teams are more innovative and produce more impactful research. Excluding women and other marginalized groups leads to missed opportunities for innovation and solutions to global challenges like climate change and health crises. This exclusion risks further entrenching biases and neglecting key research priorities. It is crucial that voices from all regions, especially marginalized communities, shape research agendas and drive innovation.

IDRC's commitment to gender equality in STEM

Building evidence on gender equality has been a priority for IDRC throughout its history, from ensuring that women participate in research projects as researchers and beneficiaries to identifying how to scale much needed services, like childcare or sexual and reproductive health rights. All IDRC-supported research considers gender in its rationale and most of it addresses gender equality through the meaningful participation of women in marginalized communities, for example, or by generating new data on gender inequality.

Inequalities exist across multiple and intersecting categories of identity, including, but not limited to gender, sexuality, age, class, race, caste, ethnicity, citizenship status, religion, and ability; taking an intersectional approach to equality recognizes these differences and understands diversity as central to advancing equality. Given that gender inequality is a significant barrier across all dimensions of diversity, IDRC invests specific efforts in ensuring its work promotes gender equality.

The Breaking Barriers Network

As part of its 2030 Strategy, IDRC has committed to promoting gender equality in STEM. IDRC recognizes that gender equality is crucial for scientific innovation and development. By addressing gender disparities, IDRC aims to create a more inclusive and effective research environment.

IDRC funded the "Breaking systemic barriers to women's participation in science" initiative in 2020 to advance its commitment to gender equity and build on its significant experience working to promote inclusivity across science systems in the Global South. The cohort of 10 projects analyzed trends of gendered participation in Southern science systems and the embedded systemic and systematic inequities that prevent women from advancing in a range of fields and sectors in Latin America and sub-Saharan Africa.
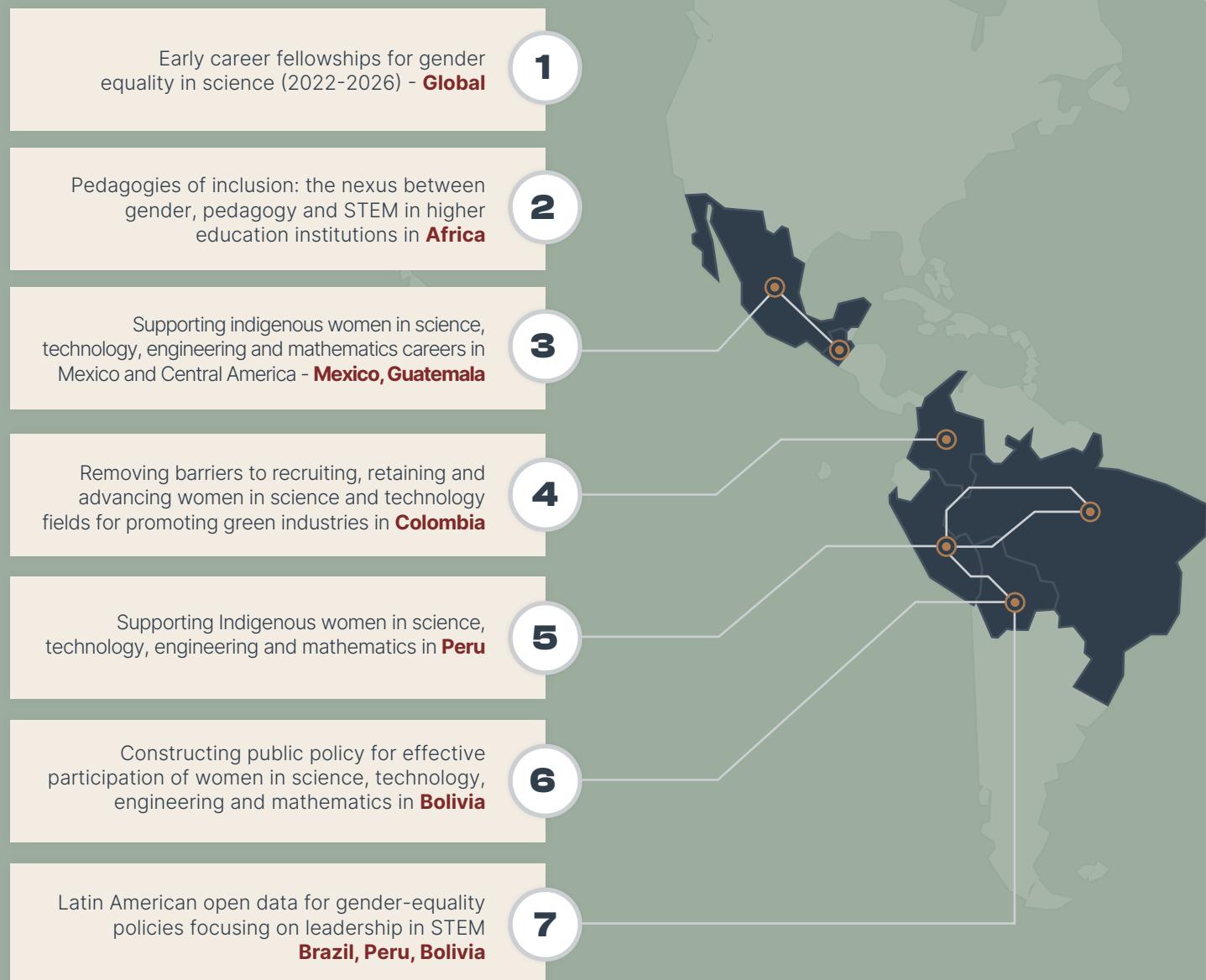
These studies generated evidence on the unique obstacles facing women and other marginalized groups in STEM in low-income countries. Building on this pilot, in 2021, funding was expanded for IDRC's Gender in STEM (GIST) initiative. The investment to advance gender analysis and women's leadership in STEM fields in the Global South has funded 6 projects across Latin America, the Caribbean and South Asia. These projects have aimed to add to existing and emerging evidence by:

| Increasing the understanding of the barriers that prevent women from progressing in STEM fields

| Providing evidence on which strategies are most effective to break down those barriers in low- and middle-income countries

| Improving women's leadership in science

| Integrating gender analysis as a standard component of scientific research

Research projects funded through both cohorts, as well as IDRC's ongoing work on providing scholarships for early career women scientists through collaboration with the Organization for Women in Science for the Developing World (OWSD), are showing results and findings relevant to various stakeholders across the Global North and South. The cohort of researchers, that make up these various initiatives, now referred to as the **Breaking Barriers Network**, is gathering and building advocacy and momentum across its relevant geographies. From conducting a gender audit at a major university in Zimbabwe to an innovative fellowship program supporting Indigenous women scientists in Mexico, the **Breaking Barriers Network** is building bridges to advance women's sustained participation and leadership across STEM fields.

BREAKING BARRIERS NETWORK

A Southern-led research network to advance gender equality in STEM

1 Early career fellowships for gender equality in science (2022-2026) - **Global**

2 Pedagogies of inclusion: the nexus between gender, pedagogy and STEM in higher education institutions in **Africa**

3 Supporting indigenous women in science, technology, engineering and mathematics careers in Mexico and Central America - **Mexico, Guatemala**

4 Removing barriers to recruiting, retaining and advancing women in science and technology fields for promoting green industries in **Colombia**

5 Supporting Indigenous women in science, technology, engineering and mathematics in **Peru**

6 Constructing public policy for effective participation of women in science, technology, engineering and mathematics in **Bolivia**

7 Latin American open data for gender-equality policies focusing on leadership in STEM **Brazil, Peru, Bolivia**

8 Women in engineering education and careers in **Benin** and **Ghana**

9 Transforming Institutions to Advance women leaders in Science Technology Engineering and Mathematics (SISTARS): Lessons from **Ghana** and **Kenya**

10 Strengthening gender inclusion in agricultural research for more conclusive results in West Africa - **Niger, Benin, Cote d'Ivoire**

11 Breaking barriers to women's participation in science, technology, engineering and mathematics in **Ethiopia**

12 Supervision and Mentorship of Women in Science Technology Engineering and Mathematics Postgraduate Training Program in Sub-Saharan Africa - **Tanzania, Burundi, Rwanda, Uganda, Kenya, South Sudan**

13 Bridging the Gender Equality Gap in Science at the Women's University in Africa **Zimbabwe**

14 Eliminating Barriers to Women's Participation in Science - A Study of the African Research Universities Alliance - **South Africa, Tanzania, Rwanda, Uganda, Kenya, Ethiopia, Ghana, Senegal**

15 Pathway to Change: Towards Gender Justice in STEM Research in Africa (GeJuSTA) **South Africa, Zambia, Kenya, Uganda**

An Evidence-Informed Research Agenda

The projects have worked to identify context-specific barriers and pilot both known and innovative interventions. These have included pedagogical practices, policies, institutionalized data gathering, and gender-responsive methodologies applied in some higher education institutions and STEM fields. Project leaders have seen success, with initiatives such as co-developing sexual harassment and gender equity policies alongside national ministries and replicating efforts across local institutions. For instance, in Zimbabwe, a project team is assisting the Ministry of Higher Education and Science and Technology in setting an agenda and developing policies on sexual harassment and addressing broader gender equity issues in higher education institutions. However, there is a need to explore how these interventions can be scaled up by involving policymakers and other key STI ecosystem stakeholders from the start.

Recognizing the critical need for ongoing efforts across the educational spectrum, it is essential that initiatives for greater gender equity and inclusion (GEI) align with national science and technology priorities and the evolving needs of industry. The systemic barriers that exist highlight the importance of a coordinated, multi-faceted approach that integrates national and regional educational, science, and technology priorities, with clear commitments to advancing equitable development.

As part of the **Breaking Barriers Network**, researchers from Latin America and Africa have collaborated to develop a research agenda grounded in existing knowledge, experience, and best practices identified by experts working in diverse contexts. Despite the persistent challenges to women's participation in STEM in both the Global North and South, these researchers have demonstrated that intentional, context-specific, and engaged interventions can help bridge the gender gap in STEM.

> The systemic barriers that exist highlight the importance of a coordinated, multi-faceted approach that integrates national and regional educational, science, and technology priorities, with clear commitments to advancing equitable development.

A THEORY OF CHANGE

Key Assumptions

Importance of Comprehensive Programs
Role of Participatory Research
Value of Role Models
Need for Policy Integration and Implementation
Community Engagement and Education
Transformative Learning

Barriers

Gender stereotypes, cultural and societal norms shape women's aspirations and experiences in STEM.

There is a lack of female role models and mentors in STEM fields.

Gender biases in education undermine women's confidence in STEM.

Women face undervaluation and discrimination in STEM workplaces.

There are insufficient policies that support and protect women in STEM.

Activities

Establishing initiatives to promote gender equity, including gender responsive policies, mentorship programs, and scholarship programmes. Additionally, conducting gender audits to ensure safe and supportive environments for women.

Comprehensive data collection efforts that utilize genderresponsive methodologies to identify barriers to women's participation in STEM, inform evidence-based policies that address gender inequalities.

Designing and implementing mentorship frameworks and collaborative networks that empower marginalized women in STEM, providing them with leadership opportunities and resources to enhance their participation in decision-making and research initiatives.

Building support systems to facilitate women's transitions from STEM education to the workforce. These systems include curriculum revisions, capacity-building initiatives, and policy frameworks, ensuring women receive ongoing support throughout their careers.

Desired Outcomes

Expanding Leadership and Mentorship Opportunities: Frameworks and initiatives provide leadership opportunities to marginalized groups often excluded from decision-making and research agendasetting. This includes scaling mentorship practices, postgraduate training, and fostering collaborative networks for women and other underrepresented individuals in STEM.

Strengthening Data Collection and Analysis: Improved data collection on gender, racial, and social disparities is critical to understanding factors such as attrition, low participation, and high-risk dropout moments. This evidence base informs policies that address barriers to success in STEM education and careers for marginalized groups.

Facilitating Coordinated Support Across Education and Career Pathways: Coordination between institutions and policies across the educational spectrum and workforce is essential to ensure continuity of support. Gendersensitive training and gender-responsive pedagogies help sustain inclusivity, while addressing the unique challenges faced by marginalized groups as they transition from education to STEM careers.

Enhancing Gender-Responsive Institutional Policies: National science institutions and workplaces integrate gender and inclusivity principles into policies to promote marginalized groups in STEM, ensuring advocacy, alignment with science priorities, and creating supportive environments free from gender-based violence, harassment, and discrimination.

Ultimate Goal

Science systems are made more inclusive, enabling women to emerge as leaders and contribute to knowledge and innovation that improves people's lives.

Activities

To date, the **Breaking Barriers Network** has collectively advanced work in different areas:

Developed an Evidence-base

Generating evidence on how to improve gender equality and diversity in STEM, through scoping and the testing of promising interventions.

Established Collaborative Networks

Establishing networks of female researchers and practitioners to foster collaboration and support.

Built and Strengthened Capacities

National science institutions and workplaces integrate gender and inclusivity principles into policies to promote marginalized groups in STEM, ensuring advocacy, alignment with science priorities, and creating supportive environments free from gender-based violence, harassment, and discrimination.

Influenced Policy Capacities

Improved data collection on gender, racial, and social disparities is critical to understanding factors such as attrition, low participation, and high-risk dropout moments. This evidence base informs policies that address barriers to success in STEM education and careers for marginalized groups.

Developed Monitoring and Evaluation Frameworks

Developing robust mechanisms to monitor and evaluate the impact of gender equality initiatives, ensuring continuous improvement and accountability.

Desired Outcomes

The **Breaking Barriers Network** has crafted an evidence and experience-based research agenda, pinpointing key areas for future research and broader implementation. The main areas of focus and action include:

Comprehensive Gender-Responsive and Inclusive Institutional Policies

National science institutions and workplaces integrate gender and inclusivity principles into policies to promote marginalized groups in STEM, ensuring advocacy, alignment with science priorities, and creating supportive environments free from gender-based violence, harassment, and discrimination.

Data-Driven Approaches to Address Disparities and Marginalization

Improved data collection on gender, racial, and social disparities is critical to understanding factors such as attrition, low participation, and high-risk dropout moments. This evidence base informs policies that address barriers to success in STEM education and careers for marginalized groups.

Leadership and Mentorship Opportunities for Underrepresented Groups

Frameworks and initiatives provide leadership opportunities to marginalized groups often excluded from decision-making and research agenda-setting. This includes scaling mentorship practices, postgraduate training, and fostering collaborative networks for women and other underrepresented individuals in STEM.

Coordinated Support Across Education and Workforce Transitions

Coordination between institutions and policies across the educational spectrum and workforce is essential to ensure continuity of support. Gender-sensitive training and gender-responsive pedagogies help sustain inclusivity, while addressing the unique challenges faced by marginalized groups as they transition from education to STEM careers.

THE STATE OF WOMEN'S PARTICIPATION IN STEM IN THE GLOBAL SOUTH

I n investigating local trends in women's participation in STEM, IDRC-funded research has highlighted challenges similar to those reported in the Global North. Across various regions, women's participation and leadership in STEM fields have not kept pace with the rapid growth of STEM industries and broader advancements toward gender equality (UNESCO, 2017). Alarmingly, despite increasing representation of women in higher education throughout the Americas and Europe, significant attrition occurs as women transition from STEM education to the workforce and even into advanced levels of education (European Commission, 2021; National Science Foundation, 2021).

Recent studies reveal that while female engagement in STEM research averages around 40% in regions like Latin America, the Caribbean, and parts of Europe, it remains lower in North America and Western Europe, hovering around 30% (UIS, 2019). This disparity underscores the need for targeted interventions to support women at critical transition points in their STEM careers. We highlight other major trends and statistics.

Workforce

Dropout rates
Women are more likely to leave STEM careers within the first 10 years compared to men (National Center for Women & Information Technology, 2016).

Global STEM workforce
Women make up only **28%** of the global STEM workforce (UNESCO, 2021).
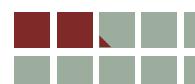
Leadership positions
Women hold less than **15%** of senior leadership roles in STEM organizations (Catalyst, 2020)

Pay gap
In Europe, women in STEM earn on average **20%** less than their male counterparts (European Commission, 2020).

Field-specific disparities
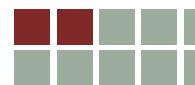
Physics
In physics, women constitute just **21%** of the undergraduate degree recipients (American Physical Society, 2021).

Engineering and Computer Science
In engineering and computer science fields, women represent less than **20%** of the workforce (OECD, 2019).

Sustainability
By 2030, between 15 and 22 million green jobs are projected, yet over 80% are in traditionally male-dominated sectors such as agriculture, energy, manufacturing, transportation, and construction. Women are underrepresented in these areas, with fewer than 20% working in renewable energy. In countries like Uruguay, Bolivia, Costa Rica, El Salvador, and Honduras, women account for 17% to 36% of researchers in engineering and technology.

Agricultural Sciences
Women are notably underrepresented in higher education and research positions in agricultural sciences, with fewer than 25% of staff in relevant academic and training units being women. In public universities in West Africa, the proportion of women in agricultural science courses is as low as 15.36% in Benin, 17.19% in Niger, and 22.22% in Côte d'Ivoire. Women constitute only 16.46% of research team members in these countries.

Education

Higher education
Women account for just **30%** of all researchers globally (UNESCO, 2021).

Enrollment in STEM fields
In higher education, only **35%** of all students enrolled in STEM-related fields are women (UNESCO, 2019).

Patents and Publications

Publication rates
Women publish fewer scientific papers than men, and their papers are cited less frequently (Elsevier, 2020).

Patents and innovation
Women are listed as inventors on less than **10%** of patent applications worldwide (World Intellectual Property Organization, 2019).

Barriers to participation and leadership

These challenges are not isolated incidents but are part of a broader pattern that has been extensively documented. Research from the Breaking Barriers Network, a collaborative effort at understanding and addressing these obstacles, has uncovered several key issues:

Gender Stereotypes and Societal Norms

Gender stereotypes significantly influence the perception of which STEM-related jobs are deemed appropriate for women and men. These stereotypes often limit women's career aspirations and discourage them from pursuing or advancing in STEM fields. Societal expectations and traditional roles, particularly in patriarchal communities, create additional barriers by reinforcing beliefs that women are less suited for technical and scientific professions. For instance, the notion that STEM fields are inherently masculine can deter women from entering or persisting in these careers, as they may internalize these beliefs or face external discouragement.

Lack of Role Models and Mentorship

The scarcity of female role models and mentors in STEM fields contributes to the underrepresentation of women in these areas. Without visible and accessible female scientists and leaders, young women may lack the inspiration and guidance necessary to pursue STEM careers. This absence is evident in academic settings, where female faculty members and researchers are underrepresented, and in professional environments where women's contributions are less recognized. Additionally, the lack of structured mentorship programs exacerbates this issue, as women may miss out on valuable guidance and networking opportunities that are critical for career development.

Educational Barriers

Educational environments often fail to support women effectively, impacting their confidence and interest in STEM subjects. Gender biases in teaching practices and curricula can undermine women's self-esteem and academic performance in subjects like mathematics and science. Social and educational contexts may perpetuate the belief that women are less capable in these areas, which can lead to lower self-confidence and reduced participation. Furthermore, the intimidation of entering male-dominated academic spaces and the potential for hostile or exclusionary behaviors can deter women from pursuing advanced studies or careers in STEM. Limited training opportunities in technical subjects related to emerging green industries also restrict women's career progression and access to leadership roles.

Workplace Barriers

Women in STEM often encounter significant obstacles in the workplace, including the undervaluation of their technical skills. This bias can manifest in fewer opportunities for career advancement, recognition, and participation in high-impact projects. Gender-based discrimination and harassment, such as inappropriate comments and exclusion from key meetings or decision-making processes, further contribute to a challenging work environment. Additionally, a lack of institutional policies and resources to support women's career development—such as flexible work arrangements, pay equity, and career development programs—can hinder their professional growth and retention.

Cultural and Social Barriers

Cultural norms and practices can severely restrict women's participation in STEM fields. For example, in some regions, traditional views on land ownership and gender roles limit women's involvement in agricultural sciences and other STEM-related areas. Cultural expectations regarding women's primary roles in domestic responsibilities and familial obligations can also constrain their ability to engage in STEM careers. These cultural practices often intersect with societal attitudes that view women's contributions as less valuable, further perpetuating their marginalization.

Policy and Institutional Barriers

National and institutional policies frequently lack integration of gender considerations, resulting in insufficient support for women in STEM. Many existing policies do not adequately address the specific needs and challenges faced by women, leading to ineffective implementation and limited impact. For example, policies may fail to promote gender diversity in recruitment, advancement, and leadership roles within STEM organizations. The lack of enforcement of gender equity guidelines and the absence of dedicated resources to implement supportive measures further exacerbate these barriers. Effective policy integration is essential for creating environments that support and sustain women's participation and leadership in STEM.

Responding to UNESCO's Call to Action to Close the Gender Gap in Science

IDRC's Breaking Barriers Network reflects only a snapshot of the global movement to bridge the gender gap on women's participation and success in STEM. There has been a growing awareness among the international community of the importance of gender equality in STEM. Various organizations, governments, and advocacy groups have been actively working to promote gender diversity and inclusion in these fields.
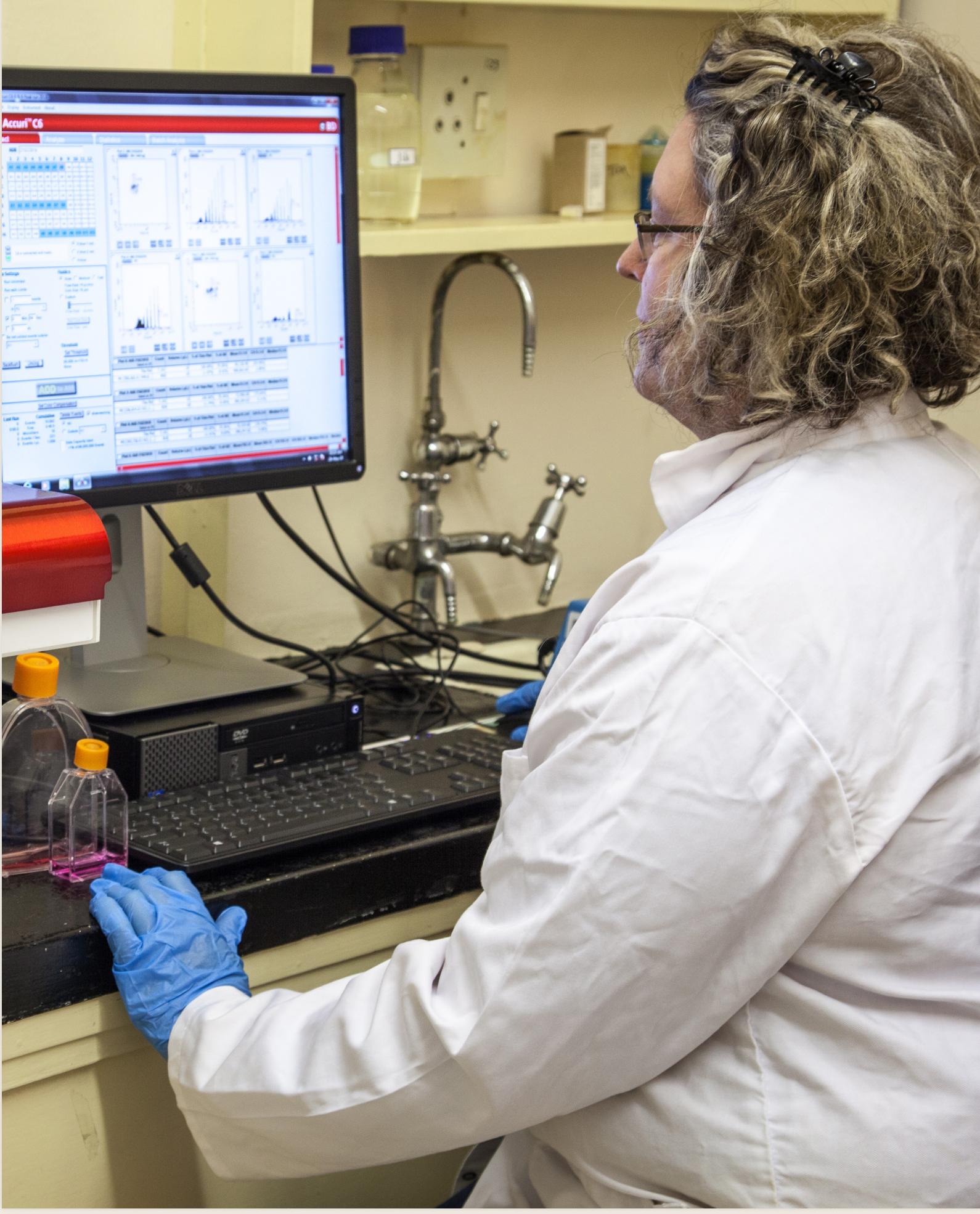
A key moment for this community has been the launch of UNESCO's 2024 Call to Action entitled "Closing the Gender Gap in Science." While this call emphasizes the importance of gender equality in addressing complex global challenges, it also highlighted the significant gaps that exist, which map directly onto many of the systemic and systematic barriers that IDRC's research collaborators have confronted and identified to date.

The call to action proposed three strategic areas of intervention, each with a set of recommendations and potential actions. The three areas of intervention are:

> Dismantling gender stereotypes and biases in science through increased visibility of role models.

> Opening educational pathways for girls in science through innovative educational strategies and initiatives.

> Creating workplace environments that attract, retain, and advance women scientists through policies and actions that promote diversity, equity and inclusion.

One of the main goals of UNESCO's call to action is to mobilize the scientific community to advance gender equality in science. This requires a solid foundation of evidence and knowledge that can inform effective policies and practices. A research agenda that is responsive to the needs and contexts of different regions and disciplines is essential to support the implementation of the call to action.

In alignment with this vision, IDRC's investments to identify and address barriers facing women in STEM in the Global South have been pivotal. As IDRC-funded projects conclude and further findings emerge, a community of global scholars has answered this call to action. Here, we present a snapshot of the evidence base generated by the **Breaking Barriers Network** that only moves us closer to building bridges to women's participation and success in STEM.

ACHIEVING GENDER EQUITY IN STEM

A Multi-Pronged Approach to Addressing Systemic and Systematic Barriers

Through the **Breaking Barriers Network**, IDRC is advancing its efforts to address systemic and systematic barriers to women's participation and leadership in STEM. With projects focused on specific research modalities, contexts, scales, and even STEM disciplines, teams are effectively addressing different challenges and issues and uncovering areas of future research and collaboration.

Building Gender-Responsive and Equitable STEM Institutions

Leveraging Data to Address Gender Disparities

Ensuring Support Across Education and Career Pathways

Fostering Leadership and Mentorship for Women in STEM

Building Gender-Responsive and Equitable STEM Institutions

Projects from across the Breaking Barriers Network have worked diligently to begin to institutionalize gender-responsive policies that promote equity and inclusivity within STEM institutions. Formal mentorship programs have been developed to support women in fields such as engineering, agronomic sciences, green industries, and water management. These programs connect emerging female scientists with experienced mentors, offering them critical resources, guidance, and encouragement to navigate their STEM careers. Additionally, the projects have established and supported scholarship and incentive programs to motivate women to pursue STEM studies and recognize their academic achievements, ensuring ongoing participation in research and innovation.

To foster greater gender equity in university settings, one of our projects in Zimbabwe introduced gender audits in both academic and workplace environments. These audits assess institutional practices and policies to identify gender disparities and improve accountability. Gender mainstreaming strategies were also put in place, ensuring that equity is embedded in the organizational culture and that gender-based violence, harassment, and discrimination are actively prevented. These efforts have created safer, more inclusive environments where women can thrive, free from systemic barriers.

What's needed?

A focus on evaluating existing gender-responsive policies at national and institutional levels, identifying gaps and areas for improvement to ensure alignment with national science priorities. There is a need to explore the impact of advocacy efforts on women's representation in leadership and decision-making roles within STEM, generating evidence to support policy refinement.

Leveraging Data to Address Gender Disparities

Given an increasing acknowledgement of the lack of gender-based data to support interventions in this space, some projects have prioritized data-driven approaches to understanding and addressing gender disparities in STEM. Projects have established comprehensive data collection and digitalization efforts in countries such as South Africa, Uganda, Kenya, Zambia, Bolivia, Brazil and Peru. Some projects, such as our project in South Africa, is using gender-responsive methodologies to gather gender-disaggregated data on women's participation in STEM fields, identifying barriers and critical points of attrition, such as during transitions from education into the workforce.

Existing data collection efforts go beyond gathering statistics; projects like the ELLAS Network are building institutionalized systems that allow universities and research bodies to continuously monitor progress. This gender-disaggregated data provides the foundation for developing evidence-based policies that directly address gender inequalities. Furthermore, by integrating gender analysis into STEM research across disciplines, we are uncovering valuable insights into how gender dynamics influence STEM success, contributing to more informed and effective policy interventions. In West Africa, particularly in Benin, Côte d'Ivoire, and Niger, participatory research methods such as Participatory Rural Appraisal (PRA) were used to gather insights from women farmers and develop gender-sensitive research approaches. These methods ensured that women's perspectives were included in agricultural data collection, addressing gender disparities embedded in research methodologies.

Some projects are beginning to develop digital platforms, as these also play a key role in promoting gender equality. By showcasing the contributions of women in traditionally male-dominated fields such as agriculture and ICT, these platforms help enhance visibility and recognition of women's roles in STEM, while contributing to a larger body of evidence needed to advocate for policy changes.

What's needed?

We must prioritize the collection and analysis of comprehensive data on the factors contributing to attrition and low participation rates among marginalized groups in STEM, focusing on existing mechanisms and platforms for institutional and national-level data collection. Future efforts should examine high-risk moments for dropout across the educational spectrum and during transitions into the workforce, aiming to develop targeted interventions based on empirical findings to address these critical gaps.

Fostering Leadership and Mentorship for Women in STEM

The Network has made significant progress in creating leadership and mentorship pathways for marginalized women, who are often excluded from decision-making and research leadership roles. In Kenya, Uganda, Tanzania, Rwanda, Burundi and South Sudan, the East African Supervision and Mentorship Framework was co-designed by key stakeholders with the aim of strengthening the connection between the women researchers and mentors. These programs not only provide women with the technical skills they need to succeed, but also build their confidence and leadership capacities, enabling them to participate in research agenda-setting and policy development.

Teams have also fostered partnerships with advocacy groups and networks, such as the Organization for Women in Science for the Developing World, the Ghana Institution of Engineering, and Women in STEM Ghana. These collaborative networks offer platforms for women to share best practices, resources, and mentorship opportunities. Through these networks, we have been able to scale our efforts and establish regional platforms that support female researchers, enhancing their access to leadership opportunities across academic, research, and industry settings.

In addition, leadership programs have emphasized the need for intersectionality, ensuring that women from diverse backgrounds, including those from marginalized and underrepresented communities, are prioritized in leadership and mentorship initiatives. This inclusivity ensures that decision-making processes in STEM are reflective of a wide range of voices and experiences. PEPMI acknowledged this gap in intersectional thinking at the university level, developing a scholarship program directly targeting Indigenous women otherwise unable to pursue studies in STEM in Mexico.

What's needed?

Explore the effectiveness of mentorship frameworks in supporting women, particularly those from underrepresented groups, in STEM fields. Future efforts should assess the impact of partnerships with advocacy organizations and digital platforms in enhancing mentorship connections, as well as investigate leadership training programs that equip women with the necessary skills and confidence to assume decision-making roles.

Ensuring Support Across Education and Career Pathways

Projects have begun to develop coordinated, multi-level support system to help women transition successfully from STEM education into the workforce. At the educational level, one project has developed curriculum revisions to ensure gender equity is embedded in learning materials and teaching practices. Other projects are promoting capacity-building initiatives for lecturers and university staff emphasize gender-sensitivity training and the adoption of gender-responsive pedagogies. These efforts create inclusive learning environments where women are not only encouraged to participate, but also given tailored support that addresses their unique challenges.

At the policy level, certain projects have been instrumental in shaping national frameworks such as the Science, Technology, and Innovation (STI) Policy and the Education Strategic Plan in Zimbabwe, which emphasize gender equity in STEM education and research. These policies ensure that women have equal access to scholarships, research opportunities, and leadership roles. Project teams are also actively working to address systemic barriers in the workplace by developing re-integration programs for new mothers and women returning from career breaks, helping them re-enter the STEM workforce seamlessly.

Furthermore, project teams have scaled these support mechanisms beyond individual institutions, working with inter-university networks and regional bodies to ensure that women across different sectors and geographies receive the support they need to succeed. These efforts include the development of regional mentorship frameworks, scholarship programs, and gender awareness programs that create continuity in support as women move from education to the workforce. By ensuring coordinated action between educational institutions, advocacy groups, government agencies, and industry, we are building a seamless pathway for women to enter and thrive in STEM careers.

What's needed?

Investigate strategies to create a seamless support system that bridges education and workforce transitions for women in STEM. We must explore collaborative approaches among educational institutions, government agencies, and industry partners to implement gender-sensitive curricula, capacity-building initiatives, and re-integration programs. Future research needs to address the prevalence and impact of gender-based violence and discrimination in academic and professional settings, providing recommendations for fostering safe and supportive environments.

WHAT HAVE WE

LEARNED SO FAR?

Importance of Comprehensive Programs

Programs that combine educational interventions with organizational learning processes are effective in promoting gender equity in STEM fields. These programs address barriers at multiple levels and create supportive environments for women.

Role of Participatory Research

Participatory research methods are valuable for understanding the specific challenges women face and developing gender-sensitive research approaches. Involving women in the research process ensures that their perspectives are included and addressed.

Impact of Mentorship and Role Models

Initiatives that provide mentorship and highlight female role models are crucial for inspiring and supporting young women in STEM. These programs help combat negative stereotypes and promote broader social and gender equity goals.

Need for Policy Integration and Implementation

Effective policy integration and implementation are essential for supporting women's inclusion in leadership roles within STEM fields. Programming to date highlights the importance of developing comprehensive policies and ensuring their effective implementation.

Community Engagement and Education

Addressing cultural and social barriers requires community engagement and education. Programs that involve community members and address traditional norms are effective in promoting gender equality and supporting women's participation in STEM.

Transformative Learning

Transformative learning approaches, which focus on changing beliefs, attitudes, and behaviors, are key to addressing root causes of inequality and generating radical changes at individual, organizational, and educational system levels. These approaches are essential for creating lasting change and promoting gender equity in STEM fields.

CONCLUSION AND RECOMMENDATIONS

The journey towards gender equity in STEM is multifaceted and requires a concerted effort from all stakeholders. The programs, initiatives and research findings outlined highlight the importance of comprehensive programs, participatory research, mentorship, policy integration, community engagement, and transformative learning. These elements are crucial in addressing systemic barriers and fostering an inclusive environment for women in STEM.

The work of the IDRC and its partners exemplifies the potential for impactful change to dismantle identified challenges through targeted interventions and collaborative efforts. By identifying context-specific barriers and piloting innovative solutions, significant strides have been made in promoting gender equity. The success stories from various regions, such as the collaborative policy development in Zimbabwe and commitments to incorporate mentorship programs across universities in East Africa, demonstrate the effectiveness of these approaches.

However, to sustain and scale these efforts, it is imperative to involve policymakers and key stakeholders from the outset. This ensures that interventions are not only implemented but also institutionalized, creating a lasting impact. By continuing to build on these foundations and expanding the reach of successful programs, we can move closer to achieving true transformation of our science systems, making them more equitable and inclusive, and reflective of the populations their innovations can service.

The path forward requires a commitment to ongoing research, policy advocacy, and community engagement. By leveraging the collective expertise and experiences of diverse stakeholders, we can create a more equitable and inclusive STEM landscape that benefits everyone.

Recommendations
POLICYMAKERS

Increase Visibility of Women Scientists	Launch national media campaigns and public lectures to highlight women scientists, fostering a positive association between women and science.
Combat Gender Stereotypes	Implement and enforce gender-sensitive policies to dismantle stereotypes and promote equitable participation in STEM fields.
Provide Incentives for Girls' Performance in STEM	Offer scholarships and incentives to motivate girls in STEM studies, and recognize their achievements to encourage continued participation.
Implement National and Institutional Policies	Promote STEM education through comprehensive policies already existing at the university and institution level.
Develop Mainstreaming Strategies	Develop strategies with clear objectives and accountability structures, including policies for gender-based violence prevention and response.

Recommendations
UNIVERSITIES AND EDUCATION INSTITUTIONS

Increase Visibility of Women Scientists	Launch national media campaigns and public lectures to highlight women scientists, fostering a positive association between women and science.
Expand Outreach and Mentorship Activities	Strengthen support systems in schools and universities, and implement formal mentorship programs to support women in various STEM sectors.
Develop Interactive and Equitable Learning Environments	Create inclusive learning environments and provide vocational guidance and mentorship to support career development in STEM fields.
Staff Development in Gender-Sensitive Pedagogy	Train university lecturers on gender-sensitive teaching methods and review curricula to make them more inclusive.
Improve Data Collection and Analysis	Implement systems for collecting gender-disaggregated data in all training and research structures, ensuring methodologies mitigate gender biases.
Conduct Gender Audits	Perform gender audits across relevant education institutions.

Recommendations

SCIENCE AND RESEARCH INSTITUTIONS

Increase Visibility of Women Scientists
Feature women scientists in research publications and conferences to enhance their visibility and inspire future generations.

Expand Outreach and Mentorship Activities
Facilitate mentorship programs and outreach activities to support women in STEM, particularly in specialized fields like water and agronomic sciences.

Enhance Policy Awareness and Participation
Restructure promotion processes, provide resources for research, and develop monitoring and evaluation frameworks to track progress and impact.

Provide Capacity Building and Training Opportunities
Offer scholarships, networking opportunities, and targeted training programs, including reintegration programs for returning new mothers.

Adopt a Multi-Stakeholder and Coordinated Approach
Collaborate with government agencies, educational institutions, and advocacy groups to improve female participation in STEM disciplines.

Recommendations

WOMEN IN STEM

Increase Visibility of Women Scientists
Participate in media campaigns, public lectures, and educational materials to inspire young girls and establish a positive association with science.

Expand Outreach and Mentorship Activities
Engage in mentorship programs and outreach activities to support and guide other women in STEM fields.

Combat Gender Stereotypes
Advocate for and participate in awareness campaigns to challenge gender biases and stereotypes in STEM.

Provide Capacity Building and Training Opportunities
Take advantage of scholarships, networking opportunities, and training programs to advance in STEM careers.

Reinforce Educational Policies
Foster girls' and women's continued registration in STEM, particularly in male-dominated disciplines, and address cultural and social barriers limiting participation.

APPENDIX

A Snapshot of our Projects

Supporting women's leadership in science, technology, and innovation through early-career fellowships (2017–2021)

Background

The OWSD Early Career Fellowship is an award of up to USD 50,000, aimed at supporting women who have completed their PhDs in STEM fields. The fellowship is designed for those employed at academic or research institutes in various countries in the developing world.

Objectives

Empower early career women scientists to lead significant research projects, thereby increasing the representation of women in STEM fields.

Establish and maintain international standards of research at their institutions, creating environments that attract global scholars and foster high-quality scientific inquiry.

Promote collaboration between fellows and international researchers, industry partners, and other stakeholders to enhance the impact and reach of their research.

Provide training and opportunities for fellows to develop leadership and management skills, enabling them to become leaders in their fields and mentors for future generations of women scientists.

Implementation

The fellowship provides funding for research-related costs, linking with industry partners, and outreach activities. Fellows receive training in grant management, leadership, and entrepreneurial skills. The program requires applicants to have guaranteed employment at their institution and significant time spent in the eligible country.

Impact

Capacity Strengthening: The program has significantly enhanced the research skills, leadership, and communication abilities of Early Career (EC) fellows.

Career Progression: About 70% of EC fellows reported promotions or increased responsibilities within their institutions. They gained respect and recognition in their scientific fields.

Institutional Benefits: The fellowships have also strengthened the institutions where fellows work by providing new equipment and enhancing the visibility of research, which opens doors for further collaborations.

Policy Influence: A notable percentage of EC fellows have been invited to participate in committees, consulted on STI policies, and provided advice on their fields of expertise for policymaking.

Removing barriers to recruiting, retaining and advancing women in science and technology fields for promoting green industries in Colombia

Background

This project in Colombia aimed to promote the role of women in STEM fields related to green growth through Technical and Vocational Education and Training (TVET) processes.

Objectives

Promote gender equity in green STEM fields through TVET education processes.

Address barriers such as lack of female role models, gender stereotypes, and lack of self-confidence in mathematics.

Implement a combination of soft and hard strategies to break down barriers and promote gender equity.

Implementation

The project implemented a combination of soft strategies (e.g., recognizing female leadership in STEM, inspiring women in STEM) and hard strategies (e.g., green prototypes for experiential environmental training). The project adopted a learning framework to guide the transition towards more inclusive and equitable STEM education processes.

Impact

Increased Participation: Through targeted interventions, women's participation in green STEM fields in Colombia increased. In collaboration with 15 women-led rural production units, the project applied STEM knowledge to reduce negative environmental impacts via sustainable and circular production practices. These units also became learning environments to promote gender equity in STEM, rurality, and the green economy.

Skill Development: The project empowered both female apprentices and instructors by providing experiential learning opportunities that built capacities in green technologies and environmental stewardship. One TVET Centre's hands-on training programs ensured the transfer of STEM-environmental knowledge, positioning 15 rural women and 7 women experts as key STEM referents. These role models helped overturn unfounded beliefs about women's capacities in science and technology.

Organizational Change: One TVET Centre in Colombia facilitated organizational learning and transformative learning processes, resulting in systemic change within TVET programs. Four regional TVET centers began leading the way in gender-equitable STEM education.

Empowerment: The combination of experiential learning and visible role models inspired female apprentices and instructors to pursue and excel in STEM careers. Their success in these fields challenged deep-seated stereotypes and created new pathways for future generations of women in science and technology.

Women in engineering education and careers in Benin and Ghana

Background

This project aimed to investigate the trends of women's participation in engineering education and careers in Ghana and Benin. The project sought to identify systemic barriers and propose recommendations for eliminating these barriers.

Objectives

Investigate the trends of women's participation in engineering education and careers in Ghana and Kenya.

Identify systemic barriers to women's participation and leadership in engineering fields.

Propose recommendations for eliminating these barriers and supporting women's advancement in STEM careers.

Implementation

The project included focus group discussions, surveys, and policy analysis to understand the challenges women face in engineering education and careers. The project also involved key informant interviews with senior management, human resource managers, female and male leaders, and young experts.

Impact

Policy Recommendations: The project provided valuable insights and recommendations for policy integration and implementation to support women's inclusion in leadership roles within engineering fields.

Supportive Mechanisms: The project highlighted the importance of gender advocacy centers and mentorship programs in advancing women in STEM careers.

Awareness and Advocacy: The project raised awareness about the challenges women face in engineering education and careers and advocated for more inclusive and supportive policies and practices.

Empowerment: The project empowered women by providing them with the knowledge and resources needed to navigate their careers and achieve leadership positions in engineering fields.

TranSforming InSTitutions to Advance women leadeRS in Science Technology Engineering and Mathematics (SISTARS): lessons from Ghana and Kenya

Background

The SISTARS project focuses on addressing the underrepresentation of women in leadership roles within STEM fields, particularly in the water-related sectors of Ghana and Kenya. Despite various national and institutional policies aimed at promoting gender equality, women continue to face significant barriers in advancing to leadership positions. These barriers include societal expectations, stereotypes, and systemic biases that hinder women's career progression. The project aims to assess and strengthen policies that support women's inclusion in leadership roles, recognizing that diverse leadership teams enhance performance, innovation, and decision-making.

Objectives

Assess Policy and Systemic Institutional Factors: Evaluate the existing policies and systemic institutional factors that provide opportunities for women to attain leadership roles in water-related sectors.

Identify Barriers and Opportunities: Understand the specific limitations of current policies and identify opportunities to support diversity and equity in STEM fields.

Promote Policy Improvements: Develop recommendations for policy improvements to create a more inclusive and supportive environment for women in STEM.

Implementation

The project was conducted in two phases across selected institutions in Ghana and Kenya. In Ghana, the study involved academic institutions such as the University of Ghana and the Water Research Institute, as well as industry institutions like the Ghana Water Company Limited. In Kenya, the study included faculty members from research and university institutions within STEM fields. The research employed a mixed-methods approach, including content analysis of policies, semi-structured interviews, and key informant interviews with senior management, human resource managers, and female leaders. Ethical approval was obtained from relevant committees in both countries.

Impact

Increased Visibility of Women in STEM: The project has significantly increased the visibility of women scientists in Ghana and Kenya, highlighting their contributions and establishing a positive association between women and science from an early age. This has been achieved through the dissemination of success stories and role models.

Enhanced Professional Development: The project provided valuable opportunities for women to advance their scientific careers. Through targeted training programs, mentorship, and networking opportunities, women were able to strengthen their knowledge and skills, gain recognition, and progress into leadership roles in STEM fields.

Policy Influence and Recommendations: The project has developed evidence-based policy recommendations aimed at reducing the gender gap in STEM. These include providing incentives and scholarships for girls in STEM, implementing gender-sensitive policies, and promoting equal representation of women in leadership and decision-making roles within the scientific and academic communities.

Supporting indigenous women in science, technology, engineering and mathematics careers in Mexico and Central America

Background

The Programa de Apoyo a Mujeres Indígenas en Ciencia, Tecnología, Ingeniería y Matemáticas (PEPMI) was launched in 2018 by the Centro de Investigaciones y Estudios Superiores en Antropología Social (CIESAS) with funding from the International Development Research Center (IDRC) and the Mexican National Council for Science and Technology (CONACYT). The program aimed to support indigenous women in the early stages of their scientific careers by providing three-year postdoctoral fellowships. This initiative was the first of its kind in Mexico and Latin America, targeting indigenous women with PhDs in STEM fields. The program sought to strengthen their knowledge and skills, linking them to the country's research sector and combating negative stereotypes about indigenous women.

Objectives

Support Indigenous Women in STEM: Provide postdoctoral fellowships to indigenous women scientists to enhance their knowledge and skills in their areas of specialization.

Promote Inclusion and Diversity: Increase the visibility and representation of indigenous women in STEM fields, challenging negative stereotypes and promoting broader social and gender equity goals.

Document Educational Trajectories: Study and document the personal profiles, educational trajectories, and academic experiences of the grantees to understand the factors that facilitate or obstruct their progression in STEM careers.

Implementation

The program awarded scholarships to twelve young indigenous women scientists from various states and ethnic groups in Mexico. The selection process involved leveraging CIESAS's extensive network of contacts and CONACYT's database of scholarship recipients. The program faced initial challenges due to the lack of background, norms, and practices for including indigenous women in research centers. Despite these challenges, the program garnered strong support from certain sectors of the research institutes. The grantees conducted their postdoctoral research at public research centers, where they received mentorship and support from academic staff.

Impact

Increased Visibility of Indigenous Women in STEM: The program significantly increased the visibility of indigenous women scientists in Mexico, highlighting their contributions and establishing a positive association between indigenous women and science. This was achieved through the dissemination of their research and success stories, which served as role models for younger generations.

Enhanced Professional Development: The postdoctoral fellowships provided the grantees with valuable opportunities to advance their scientific careers. They were able to strengthen their knowledge and skills, conduct cutting-edge research, and gain recognition in their respective fields. This professional development was crucial for their career progression and for breaking into leadership roles in STEM.

Combating Negative Stereotypes: By showcasing the achievements of indigenous women scientists, the program effectively challenged and combated negative stereotypes about indigenous women. This helped to change societal perceptions and promote a more inclusive and equitable environment in STEM fields.

Policy Influence and Recommendations: The findings from the program informed national and institutional policies aimed at promoting gender and social equity in STEM. The program's success demonstrated the importance of targeted support for underrepresented groups and provided a model for similar initiatives in other contexts.

Constructing public policy for effective participation of women in science, technology, engineering and mathematics in Bolivia

Background

The project addresses the significant underrepresentation of women in STEM fields in Bolivia. The project aims to enhance women's participation in STEM to achieve sustainable development goals and foster socioeconomic and technological advancement. The initiative focuses on understanding and addressing the multifaceted challenges that limit women's involvement in STEM from early education through to professional careers.

Objectives

Identify Barriers and Facilitators: Understand the barriers and facilitators for women's development and advancement in STEM fields through participatory action research.

Promote Gender Equity: Develop and propose public policies that promote gender equity and inclusion in STEM fields, particularly for indigenous women.

Enhance Visibility and Participation: Increase the visibility and participation of women in STEM through innovative programs and project proposals.

Implementation

The project employed a participatory action research methodology, involving collaborative and inclusive approaches between researchers and the community. The initial phase included three investigations across five cities in Bolivia:

Life Histories of Successful Bolivian Women in STEM: Qualitative analyses highlighting women's trajectories, challenges, and achievements.

Perceptions and Social Representations: Research aimed at identifying stereotypes and social barriers affecting women's participation in STEM.

Statistical Analysis of Women's Participation in STEM: Quantitative data to complement qualitative findings, providing a comprehensive understanding of the current situation and potential intervention areas.

The second phase involved facilitating constructive dialogue spaces with school, university, and labor market communities to generate innovative program and project proposals that significantly enhance the visibility and participation of women in STEM fields.

Impact

Increased Visibility of Women in STEM: The project has significantly increased the visibility of women scientists in Bolivia, highlighting their contributions and establishing a positive association between women and science from an early age. This has been achieved through the dissemination of life stories of successful women in STEM, which serve as role models for younger generations.

Enhanced Family and School Support: The project emphasized the importance of family and school support in fostering interest in STEM among girls. Participation in olympiads and extracurricular activities has been shown to strengthen intrinsic motivation and interest in the exact sciences. This has led to increased encouragement from teachers and parents, which is crucial for sustaining girls' interest in STEM fields.

Policy Recommendations and Implementation: The project has developed evidence-based policy recommendations aimed at reducing the gender gap in STEM. These include providing incentives and scholarships for girls in STEM, implementing gender-sensitive policies, and promoting equal representation of women in leadership and decision-making roles within the scientific and academic communities.

Improved Educational and Professional Environments: The project has highlighted the need for interactive and equitable learning environments that develop competencies

regardless of gender. It has also emphasized the importance of vocational guidance and mentorship to support girls in their academic and professional decisions in STEM.

Statistical Insights and Data-Driven Interventions: The statistical analysis provided by the project has offered valuable insights into the participation rates and barriers faced by women in STEM. This data has been crucial for informing policy interventions and ensuring that they are targeted and effective.

Bridging the gender equality gap in science at the Women's University in Africa

Background

The project "Bridging the Gender Gap in Science at Women University in Africa (WUA), Zimbabwe" was initiated to address the significant underrepresentation of women in STEM fields. Despite the country's Vision 2030 and the National Development Strategy (NDS1) emphasizing the importance of science and technology for industrialization and gender equality, women remain underrepresented in these disciplines. The project aimed to identify and mitigate systemic barriers to women's participation in STEM at WUA, which was established with a mandate to address gender disparities in education.

Objectives

Identify Systemic Barriers: Understand the systemic barriers and gendered enrollment trends in STEM fields at WUA and other higher education institutions in Zimbabwe.

Evaluate Interventions: Assess the practical and policy interventions by WUA to mitigate these barriers.

Design Novel Approaches: Develop and implement innovative approaches to reduce barriers preventing women's full participation in STEM fields.

Share Best Practices: Provide recommendations, lessons, and best practices to key stakeholders in Zimbabwe to promote gender equity in STEM education.

Implementation

The project was implemented in two phases over 36 months. The first phase focused on data collection, including a gender audit, questionnaires, focus group discussions, and key informant interviews with students, alumni, staff, and stakeholders. The second phase involved designing, implementing, monitoring, and evaluating new interventions based on the findings from the first phase.

Gender Audit: Conducted to assess the extent of gender mainstreaming at WUA, focusing on enrollment statistics, staff composition, and institutional policies.

Data Collection: Included questionnaires, focus group discussions, and key informant interviews to gather perceptions and experiences related to gender equality and STEM participation.

Interventions: Based on the findings, WUA implemented several initiatives, including the establishment of a Gender and Diversity Center, a STEM Center, and a nursing mothers' lounge. The university also included gender promotion in its strategic plan and formed partnerships with gender-based organizations.

Impact

Increased Enrollment and Participation: The project led to increased enrollment and participation of women in STEM programs at WUA. The establishment of the STEM Center provided a supportive environment for female students to engage in hands-on practice and innovation.

Enhanced Gender Sensitivity: The gender audit and subsequent interventions improved gender sensitivity within the university. The Gender and Diversity Center played a crucial role in promoting gender equality and mainstreaming gender in university policies and practices.

Policy Influence and Recommendations: The project informed national and institutional policies aimed at promoting gender equity in STEM. Recommendations included the need for gender-sensitive pedagogy, gender audits, and mainstreaming strategies in universities.

Supportive Infrastructure: The construction of a nursing mothers' lounge and the establishment of a STEM Center provided essential support for female students and staff, enabling them to balance their academic and personal responsibilities.

Strengthening gender inclusion in agricultural research for more conclusive results in West Africa

Background

Gender disparities in STEM fields, particularly in agricultural sciences, remain a significant challenge in West Africa. This study focuses on public universities and research units in Benin, Côte d'Ivoire, and Niger, examining the extent of gender inequalities and proposing strategies to improve women's participation in agricultural sciences.

Objectives

To assess the current state of gender-based inequalities in STEM, with a focus on agricultural sciences in West Africa.

To evaluate the dynamics of enrollment in West African universities and their impact on gender equality in STEM.

To identify factors contributing to gender-based inequalities in agricultural research and propose strategies to mitigate these disparities.

Implementation

Surveys with STEM students, teachers, and researchers at public universities provided data analyzed to uncover trends in gender inclusion. A systematic review of agricultural studies (2012–2021) assessed gender representation in research, while a participatory case study in Benin worked with women farmers to ensure their voices were included in agricultural research, addressing gender gaps and empowering women in decision-making.

Impact

The study revealed significant gender disparities in agricultural sciences in West African public universities. Factors such as land ownership, societal perceptions, and limited resources contribute to these disparities. Women often face challenges in accessing technologies and resources tailored to their needs. The study's findings underscore the need for inclusive research methodologies and policy interventions to promote gender equality. Recommendations include:

Inclusive Research Methodologies: Surveys and data collection methods should include women's input and be sensitive to gender issues to avoid biases.

Policy Interventions: Legal reforms and awareness campaigns are needed to ensure equal access to agricultural resources and opportunities for women.

Educational Programs: Training and capacity-building initiatives should be established to equip women with the necessary skills and knowledge for broader participation in agricultural activities.

Latin American open data for gender-equality policies focusing on leadership in STEM

Background

The Equality in Leadership for Latin American (ELLAS) Network was established in 2022 by a multidisciplinary team of researchers from Bolivia, Brazil, and Peru. This collaboration brings together expertise from diverse fields to address the significant gender data gap in STEM (Science, Technology, Engineering, and Mathematics) in Latin America. Despite global advancements in gender equality, women in STEM continue to face underrepresentation and workplace barriers. In Latin America, the lack of open and reliable data on women in STEM exacerbates these challenges, making it difficult to design and implement effective policies and initiatives to promote gender equality.

Objectives

To gather and analyze data on women in STEM across Bolivia, Brazil, and Peru.

To develop an Open Data Platform (ODP) that provides public access to this data.

To support the creation of evidence-based policies that promote gender equality and leadership in STEM.

Implementation

Data Collection: The network gathers data from primary sources (e.g., surveys, academic papers, social media) and secondary sources (e.g., government reports, existing datasets). A significant effort was made to collect over 10,000 survey responses from participants in Bolivia, Brazil, and Peru, providing valuable insights into the motivations and challenges faced by women in STEM.

Data Structuring: Collected data is transformed into structured formats suitable for integration into the ODP. This involves standardizing data from diverse sources to ensure consistency and usability.

Platform Development: The ODP is designed with a layered architecture, including data, processing, and application layers. This structure ensures efficient data management and user accessibility. The platform allows users to search, filter, and visualize data related to gender equality in STEM, including policy tracking, initiative mapping, and contextual factor analysis.

Impact

The ELLAS Network's ODP has the potential to significantly impact gender equality in STEM by providing a centralized, accessible repository of gender-disaggregated data. This platform supports researchers, policymakers, and advocates in developing targeted interventions and policies. Key impacts include:

Enhanced Data Accessibility: By centralizing data on women in STEM, the ODP makes it easier for stakeholders to access and utilize this information for research and policymaking.

Evidence-Based Policy Development: The availability of reliable data supports the creation of evidence-based policies aimed at promoting gender equality and leadership in STEM.

Regional Collaboration: The collaborative nature of the ELLAS Network fosters regional cooperation, allowing for the exchange of best practices and joint strategies to address gender disparities in STEM.

Increased Awareness and Advocacy: The platform raises awareness about the challenges faced by women in STEM and supports advocacy efforts to address these issues.

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BREAKING BARRIERS NETWORK

A Southern-led research network
to advance gender equality in STEM

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