technopolis group

July 2021

OWSD Mid-term Evaluation

Final evaluation report

Soheir Dani, Alessandro Bello, Laura Rennie, Alberto Domini, Amanda Bengtsson Jallow

Version 1

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List of abbreviations

ACE	African Centre of Excellence
AIMS	African Institute For Mathematical Sciences
EB	Executive Board
EC	Early Career
ECWS	Early Career Women Scientists
GA	General Assembly
IAP	Inter-Academy Partnership
ICT	Information and Communications Technologies
ICTP	International Centre for Theoretical Physics
IDRC	International Development Research Centre (Canada)
LDC	Least developed countries
MEAL	Monitoring, evaluation, accountability and learning
MTE	Mid Term Evaluation
OWSD	Organization for Women in Science for the Developing World
PI	Principal Investigator
SAGA	STEM and Gender Advancement
SDG	Sustainable Development Goals (Agenda 2030)
Sida	Swedish International Development Cooperation Agency
STEM	Science, Technology, Engineering And Mathematics
STI	Science Technology and Innovation
STLC	Scientifically and Technologically Lagging Countries
TWAS	The World Academy of Sciences for the advancement of science in developing countries
TWOWS	Third World Organization for Women in Science
UN	United Nations
UNESCO	United Nations Educational, Scientific and Cultural Organization

1 Introduction

This document is the final report of the Mid-term evaluation of OWSD activities, "Supporting Women's Leadership in Science, Technology and Innovation in Scientifically and Technologically Lagging Countries (2017-2021)" (hereafter referred to as "the evaluation").

Technopolis Group conducted the evaluation between May 2021 and July 2021.

The evaluation was commissioned by OWSD Secretariat. The review aims to inform on the OWSD programmes' achievements, seek lessons, and make recommendations for improvements. This mid term evaluation was foreseen as part of the Sida-IDRC grant awarded to OWSD in 2017.

1.1 The aim, scope and objectives of the evaluation

The evaluation covers the full programme period (2017-2021) and focuses on the PhD fellowship programme and the Early Career fellowship programme. The evaluation has both a summative and formative character and has the following specific objectives:

- To examine emerging results from the PhD and EC fellowship programmes.
- To examine the potential for achieving the programmes' objectives.
- To assess the relationship between the two OWSD fellowships programmes.
- To understand the challenges and opportunities OWSD faces.
- To highlight synergies and suggest resolutions to any identified challenges.
- To suggest whether any alternative programme implementation or management models could be suitable for the fellowship programmes.

The **retrospective nature** of the evaluation implies that it aims to measure the extent to which specific OWSD programme objectives are being met and collect evidence of what has changed and the factors that hinder or facilitate the changes.

The **prospective nature** of the evaluation implies that it shall also provide insight into possible improvements for the programme's future. Therefore, the evaluation shall identify lessons in the area of planning, implementation, and dissemination that will assist OWSD in decision-making and introduce evidence-based future-oriented recommendations.

There are **several potential audiences and user groups for the evaluation.** The primary users of this evaluation are OWSD management and staff for strategic and planning purposes. Other audiences include Sida-IDRC, National Chapters, OWSD members, UNESCO, TWAS, OWSD partner institutions and the general public.

1.2 The methodology

In the evaluation a variety of information sources and data collection and analytical methods were used to reach conclusions and recommendations. These methods targeted all of the evaluation questions that are listed the document. The methods are applied in different combinations to best fit the evaluation questions. We made use of multiple techniques in parallel in order to increase the reliability of the results. In evaluation terminology this is called triangulation. Triangulation facilitates validation of data through

cross verification from more than two sources. It tests the consistency of findings obtained through different tools and increases the robustness of results.

The methods applied in this evaluation can be summarised as follows:

- **Desk research** of existing data regarding OWSD activities and its fellowship programmes. This includes past evaluation reports, strategic documents, fellowship progress reports and databases, annual progress reports, minutes from donor/TAC/TWAS SC meetings, and calls texts.
- **In depth interviews with staff at OWSD Secretariat** including going through infrastructure and tools used for applications and selection of fellows.
- **Semi-structured interviews with key informants** including Donors, members of the OWSD Executive Board, members of TWAS Steering Committee, National Chapters, members of the Selection Committee, OWSD partners, EC fellows, PhD fellows and Alumnae and Fellows' Supervisors.
- **An online survey** was carried out among OWSD fellows. The survey was conducted May 19th to June 10th and has a response rate of 78% with 117 respondents who have completed the survey fully or partially. Fifty of the respondents were Early Career fellows and 67 were PhD fellows. Full results of the survey can be consulted in Appendix B.
- **Aggregation and triangulation** of data collected to analyse the outcomes of the different methods.
- Validation and drafting of the evaluation conclusions and recommendations in **team working sessions** with evaluators involved in the investigation phase.
- Feedback on the draft evaluation report and recommendations provided by OWSD secretariat in a meeting held on 24 June 2021 and taken into account to produce the final evaluation report.

Technopolis Group has carried out the evaluation with support from OWSD secretariat for data collection, identification of key informants and survey invitations.

2 Evaluation background

2.1 About the Organization for Women in Science for the Developing World (OWSD)

The Organization for Women in Science for the Developing World (OWSD), formerly known as the Third World Organization for Women in Science (TWOWS), is an international organisation based at the Headquarters of The World Academy of Science (TWAS) in Trieste in northern Italy. OWSD is a programme unit of UNESCO, embedded in the 'Trieste science system' together with organisations like TWAS, the International Centre for Theoretical Physics (ICTP), and the Inter-Academy Partnership (IAP). The framework of OWSD was first developed at an international conference on 'The Role of Women in the Development of Science and Technology in the Third World' held in Trieste in 1988. Five years later, TWOWS was officially launched in Cairo, Egypt, and at the organisation's fourth General Assembly (GA) in Beijing in 2010, TWOWS's members voted to adopt a new name, and TWOWS became OWSD.[1]

OWSD is a membership organisation with three membership levels: full members, affiliate members, and friends of OWSD. Full members, which is the only category with voting rights, are women scientists from developing countries who have completed a master's degree or higher in the natural or social sciences and are committed to the objectives of OWSD. Full members elect OWSD's Executive Board (EB) at the GA, which usually takes place every four years. The EB comprises 1 President, 4 Vice Presidents and 4 Regional Members from the 4 OWSD regions the Arab region; Asia and the Pacific; Latin America and the Caribbean. OWSD members are further represented in the four regions through National Chapters. The chain of decision-making begins at the level of the GA, which approves OWSD activities and programmes. The President and the EB implement the decisions agreed by the GA by developing Strategic and Annual Plans and supervising the work of the Secretariat in carrying out that plan. The Secretariat is run by the OWSD Programme Coordinator, who has been given the authority to make decisions and implement operations and programmes according to the direction set by the Strategic Plan and the decisions made at EB meetings. The Secretariat takes care of all administrative issues on the organisation as a whole and acts as the chief point of contact and liaison between regions, coordinates the National Chapters, and administers the programme activities.[2] The figure hereafter gives an overview of OWSD's organisational structure.

The overarching objective of OWSD is to increase the participation of women from developing countries in STEM research, teaching, and leadership and to promote the recognition of the scientific and technological achievements of women scientists in developing countries. Another objective is to promote collaboration and communication among women scientists in developing countries and the international scientific community. There is also the objective of promoting the participation of women scientists in the sustainable and economic development of their country, increasing the understanding of the role of science and technology in supporting women's development activities, and increasing the access of women in developing countries to the socio-economic benefits of science and technology. In pursuing these objectives, OWSD provides research training, career development and networking opportunities for women scientists throughout the developing world at different stages in their careers. The **PhD Fellowship Programme** and the

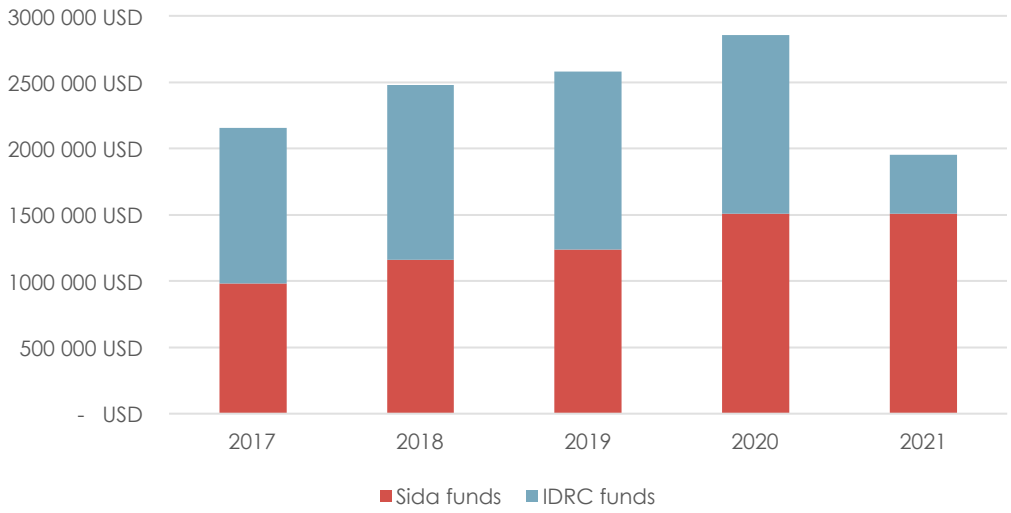
[1] OWSD, 2017, Joint Proposal to IDRC and Sida, 'Supporting Women's Leadership in Science, Technology and Innovation in Scientifically and Technologically Lagging Countries (2017–2021)', OWSD, About OWSD, https://owsd.net/about-owsd/what-owsd [accessed 2021-05-06].

[2] OWSD, 2018, The OWSD Constitution 2018, OWSD, 2017, Joint Proposal to IDRC and Sida.

Early Career (EC) Fellowship programme are OWSD's two key initiatives in this regard and the main focus of the present evaluation.[3]

Figure 1 displays the estimated budget for Sida and IDRC's Funding to the PhD and EC Fellowship Programmes over the period 2017–2021. The estimated budgets are indicative and subject to approval each year by the TWAS Steering Committee. The approved annual budget is submitted to Sida and IDRC each year.[4]

Figure 1 Estimated budgets for OWSD Fellowship programmes 2017–2021.



Source: OWSD Joint Proposal to IDRC and Sida, 2017.

2.2 Key outputs of OWSDs fellowship programmes over the 2017-2021 period

2.2.1 The Sida-funded PhD fellowship programme

OWSD's flagship programme since its launch in 1998 has been the PhD fellowship scheme. The key objective of the PhD Fellowship is to raise the scientific qualifications and experience of women from Science and Technology Lagging Countries (STLCs), increase their influence, and reduce gender inequality in the academic environment. The fellowship is offered to women from STLCs to undertake PhD research in STEM subjects at a host institute in another developing country in the Global South. The programme is administered with funds provided by the Swedish International Development Cooperation Agency (Sida) and is offered in partnership with host institutes throughout the developing world.[5]

The PhD fellowship programme aims to improve access to educational training opportunities and technology for women graduates from STLCs and increase the scientific productivity and creativity of women scientists in STLCs. Candidates can choose between either a full-time fellowship or a sandwich fellowship. The full-time fellowship provides a maximum of 4 years of funding, where the research is undertaken entirely at a host institute. The cost of a full-time

[3] OWSD, 2018, The OWSD Constitution 2018, OWSD, About OWSD.

[4] OWSD, 2017, Joint Proposal to IDRC and Sida.

[5] OWSD, 2017, Joint Proposal to IDRC and Sida, OWSD, PhD Fellowship, https://owsd.net/career-development/phd-fellowship [accessed 2021-05-06].

degree is calculated at USD 50,000 and USD 25,000 for sandwich fellowship. The sandwich fellowship requires that the candidate be a registered PhD student in her home country and undertakes part of her studies at a host institute in another country. The sandwich fellowship is awarded for a minimum of 1 and a maximum of 3 research visits at the host institute. The minimum duration of the first visit is six months, and the total number of months spent at the host institute cannot exceed 20 months. The funding period cannot exceed four years unless fellows are granted an extension on a case-by-case basis. The PhD fellowship covers a monthly allowance to cover basic living expenses such as accommodation and meals while in the host country; a special allowance to attend international conferences during the period of the fellowship; a return ticket from the home country to the host institute for the agreed research period; visa expenses; annual medical insurance contribution; the opportunity to attend regional science communications workshops on a competitive basis, and; study fees (including tuition and registration fees) in agreement with the chosen host institute. Memorandum of Understanding are an opportunity to request contributions of all kinds from the host institute.[6]

A key feature of the PhD fellowship programme is that the scheme is 'South to South', meaning that women PhD applicants from STLCs are provided with the means to go to an institute in another developing country with adequate scientific resources. As the movement is mostly regional, this might lessen the experience of culture shock, which may encourage women to persist in their studies. Regional mobility might also benefit women with family responsibilities, as can part-time placements abroad to supplement the work done at the home institute through the sandwich schemes. The sandwich schemes also facilitate a reciprocal sharing of expertise and resources between host and home institute, enabling capacity building in two developing countries simultaneously. This regional movement can also favour the relevance and applicability of research topics, as many countries within the same region may face similar challenges in terms of disease, food security, climate change, and natural disasters. In addition, 'brain drain' to the North is much less likely, with up to 90% of Awardees returning home within ten years of completing their studies or continuing post-doctorate careers at other institutes in the South. Finally, the cost of these fellowships is much reduced compared to European or North American programmes and therefore many more awards can be made.[7]

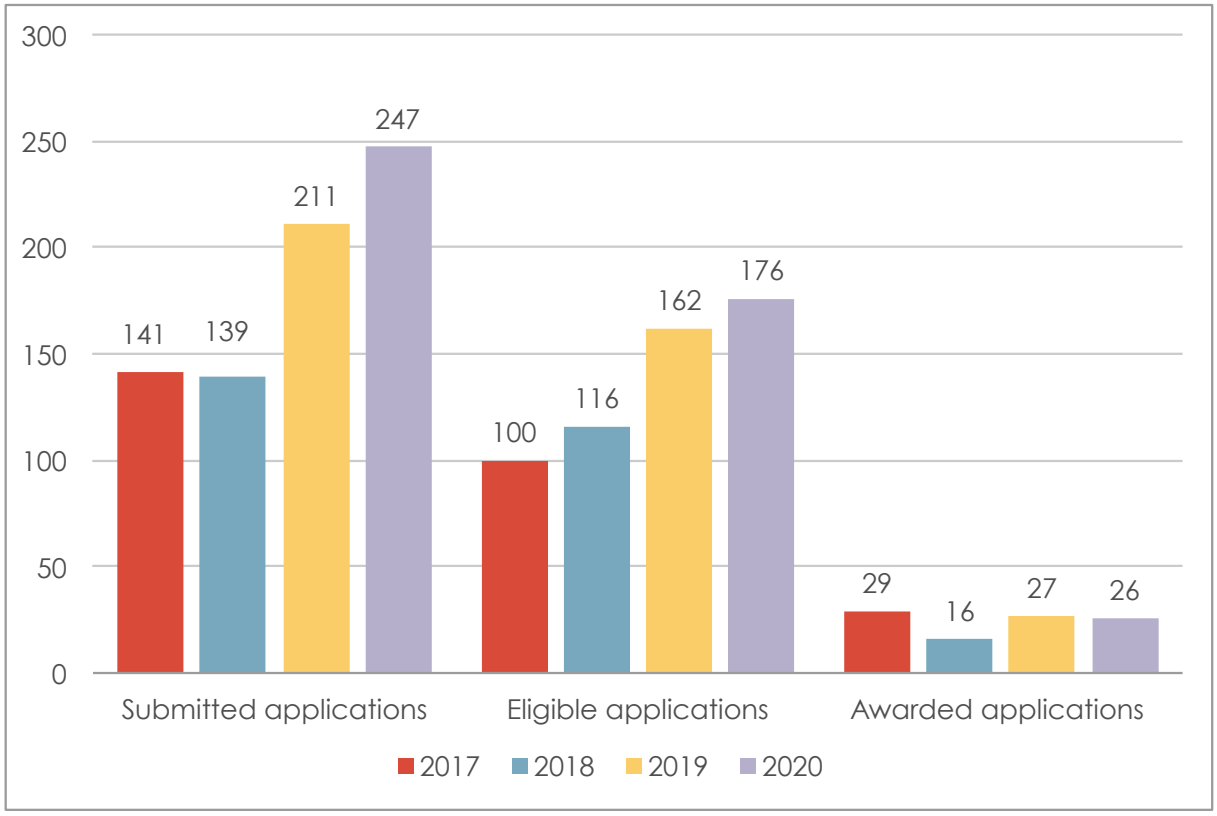
OWSD Secretariat received in total 738 applications to the PhD fellowship programme in the framework of the calls launched during the period 2017-2020. The share of applicants from LDC countries remained stable, around 60%[8] and applicants for sandwich fellowships represented about a third of the total.

[6] OWSD, 2017, Joint Proposal to IDRC and Sida, OWSD, PhD Fellowship.

[7] Alberto Quadrio-Curzio, Tonya Blowers, & Jennifer Thomson, 2020, 'Women, science and development: The leading role of OWSD'. Economia Politica (2020) 37:1–12.

[8] The United Nations recognise least developed countries (LDCs) as a category of States that are deemed highly disadvantaged in their development process, for structural, historical and also geographical reasons https://unctad.org/topic/least-developed-countries/recognition

Figure 2 Applications for PhD Fellowships 2017, 2018, 2019 and 2020.



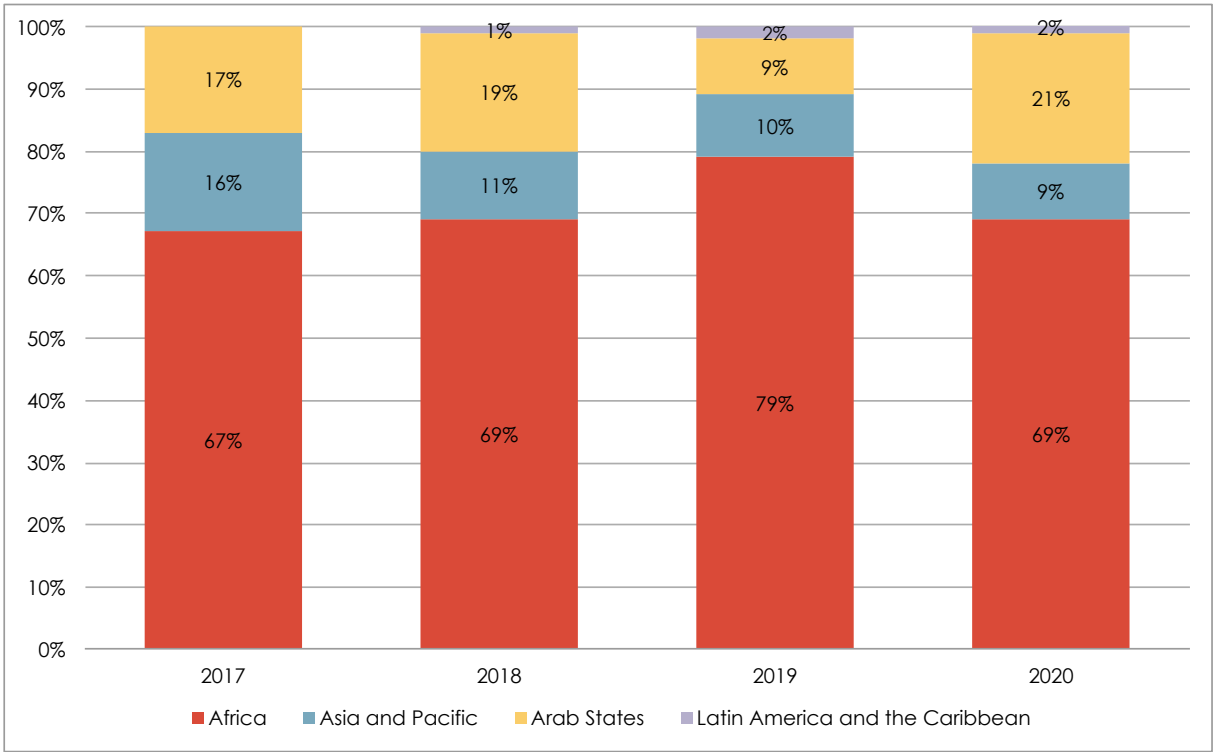
Source: OWSD Annual Progress Report 2020.

Figure 2 illustrates a lower percentage of eligible PhD applications in comparison to the Early Career Programme (see Figure 8). This might be due to the fact that the PhD applicants are generally younger and less experienced and have less contact with academics who can advise them what is required in completing the application[9].

In terms of geographical distribution, applications were received from an increasing number of countries, in total 33 different countries. The vast majority came from African countries, followed by Arab States and countries from the Asian Pacific. The figure below displays the evolution of the geographic distribution of applications during the period 2017-2020. Applications from the LAC region remain very low despite a small increase over the period.

[9] Source: 2020 Donors report_Final.

Figure 3: Evolution of geographical distribution of PhD fellowship applications



Source: OWSD PhD fellows database

Applications from Anglophone African countries have always been higher and represent over half of the total number of applications. Applications from francophone African countries, instead, remained constantly around 25% of total applications (with an exception in 2019, when they represented almost one third of total applications).

As illustrated in the figure hereafter, applications in agricultural sciences constituted the largest share of all applications received over the period. However, the share of applications in agricultural sciences has decreased over the years from almost 40% in 2017 to 30% in 2020. OWSD has received a more diverse range of applications in 2019 and 2020 and observed an increase in applications for engineering sciences and mathematical sciences which have relatively lower success rates.

Figure 4: PhD fellowship applications, per scientific field, absolute numbers, over the 2017-2020 period

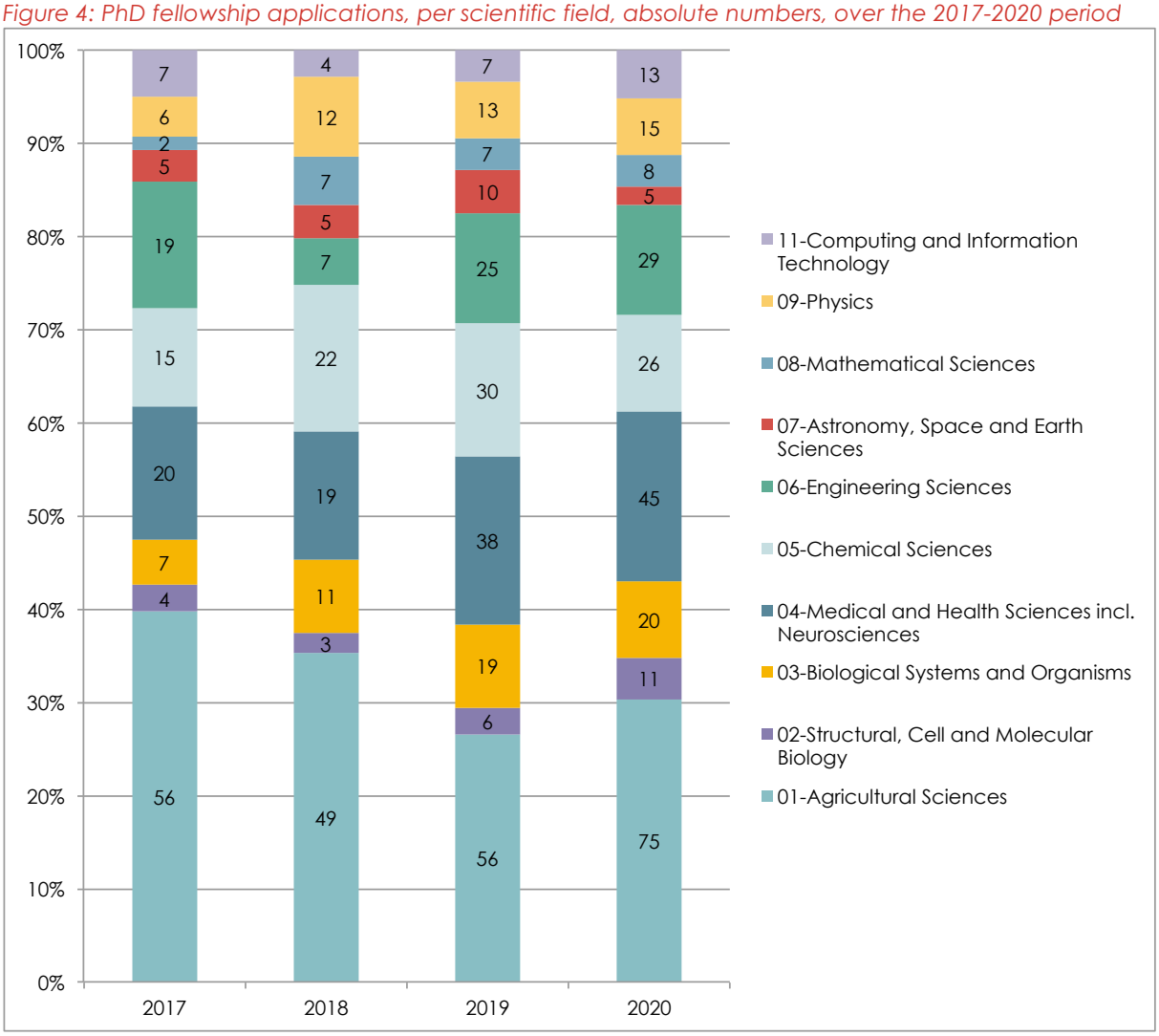
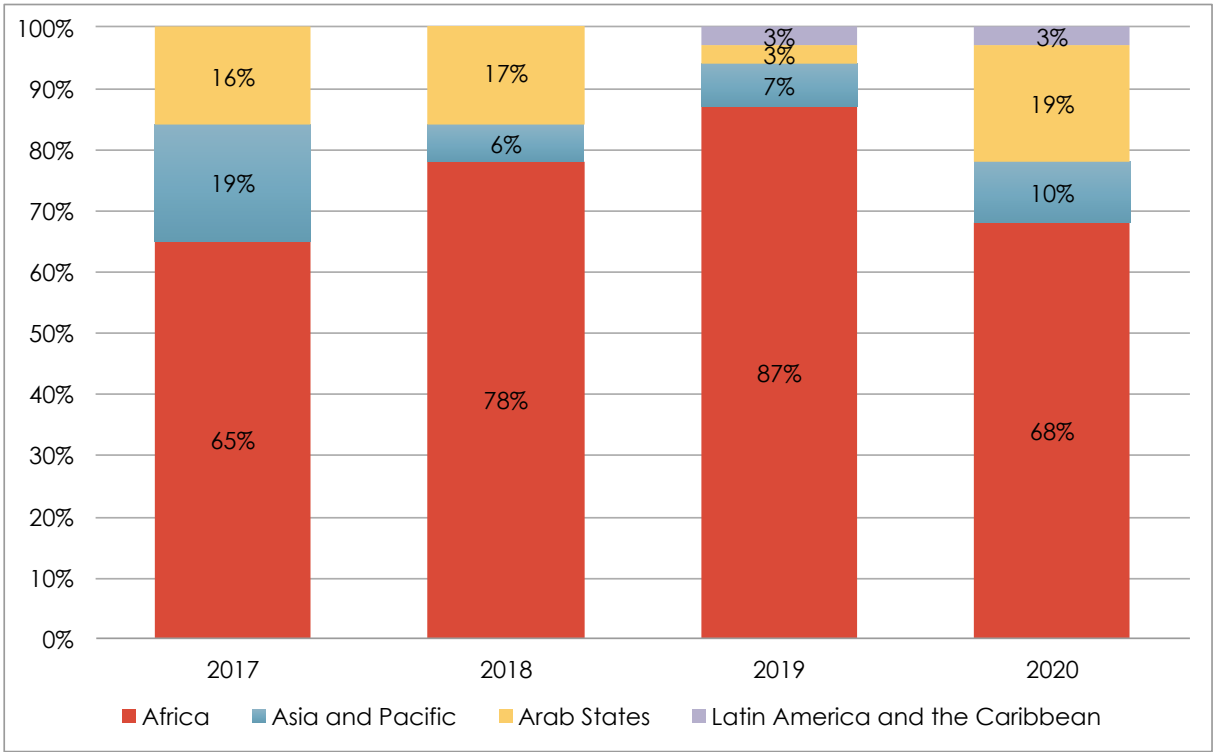


Figure 5 shows that geographic distribution of the PhD fellow awardees is relatively aligned to the distribution of applications received, with an exception in 2019 where awardees from African countries represented 87% of total awardees for 79% of applicants. In the last two years PhD fellowships were awarded to Latin American fellows.

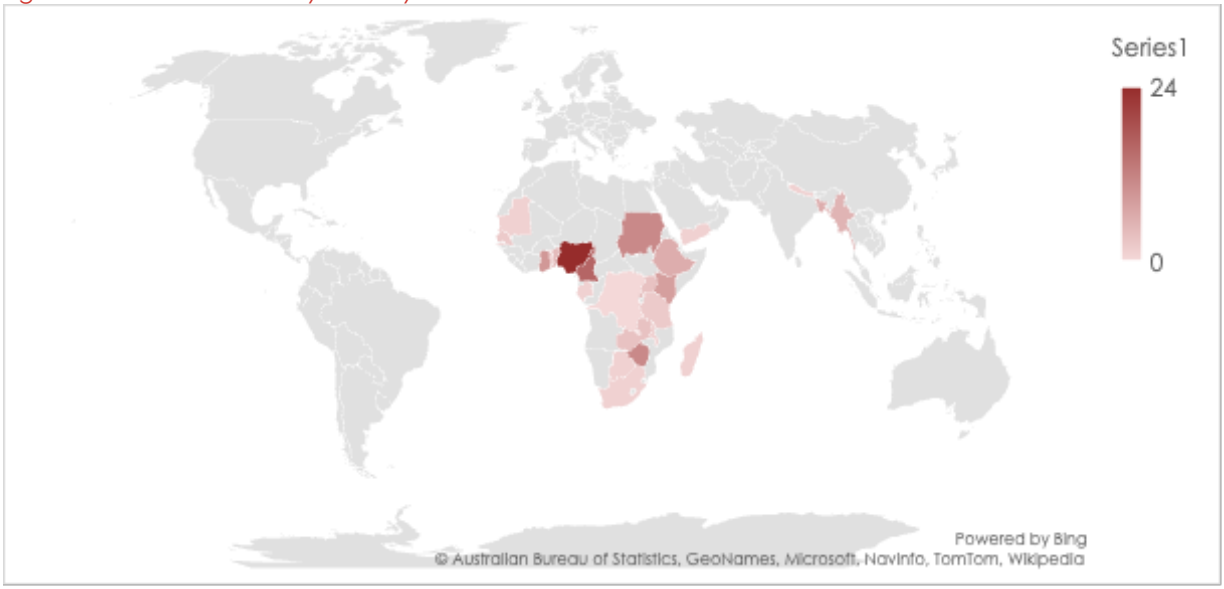
Figure 5: Geographical distribution of PhD fellowship awardees



For some eligible countries it is still difficult to attract quality applications, these include Angola, Central African Republic, Chad, Comoros, Côte d'Ivoire, Djibouti, El Salvador, Eritrea, the kingdom of Eswatini, Gambia, Guinea, Guina-Bissau, Haiti, Honduras, Liberia, Malawi, Mali, Nicaragua, Niger, Paraguay, Sao Tome and Principe, Sierra Leone, Somalia, Togo. Many of these countries have weaker Higher Education and Research systems and some have language barriers, in particular countries from Latin America and Francophone African countries.

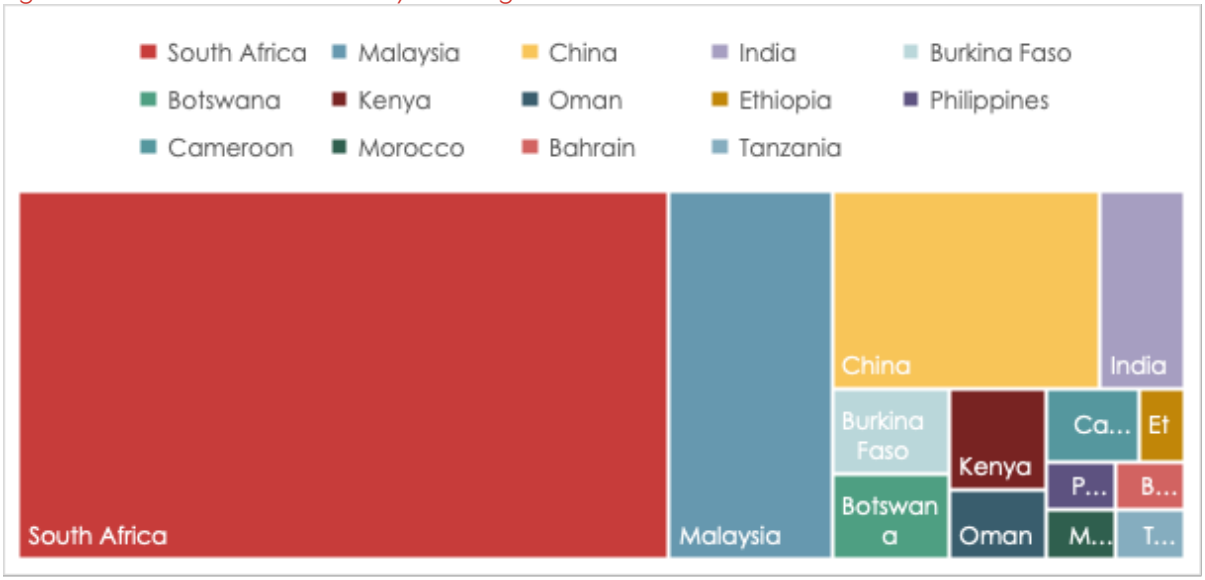
As displayed by the figure below, most of the PhD graduates are nationals of Sub-Saharan African countries, particularly from Nigeria (24 PhD graduates), Cameroon (16) and Zimbabwe (11). Noticeable is also the share of Sudanese graduates (11). Besides, 6 graduates are nationals of Asian countries (Myanmar and Nepal) and 1 is from the Arab region (Yemen).

Figure 6: PhD Graduates by country



South Africa hosted the highest number of PhD graduates (56% of total), followed by Malaysia (14%) and China (12%).

Figure 7: Host institutes and country of PhD graduates



2.2.2 *The IDRC Early Career Fellowship*

In 2017, the Fellowship programme was expanded to include the complementary Early Career Fellowship programme. As well as fulfilling the overall OWSD objective of increasing the participation of women in developing countries in scientific and technological research, teaching, and leadership, a key objective of the EC fellowship is to strengthen the EC fellows' scientific and entrepreneurial leadership skills and facilitate collaborations with industry. The purpose is to enable the conversion of women's innovative ideas and solutions into products that will benefit their local communities and contribute to their country's economic and social development.[10]

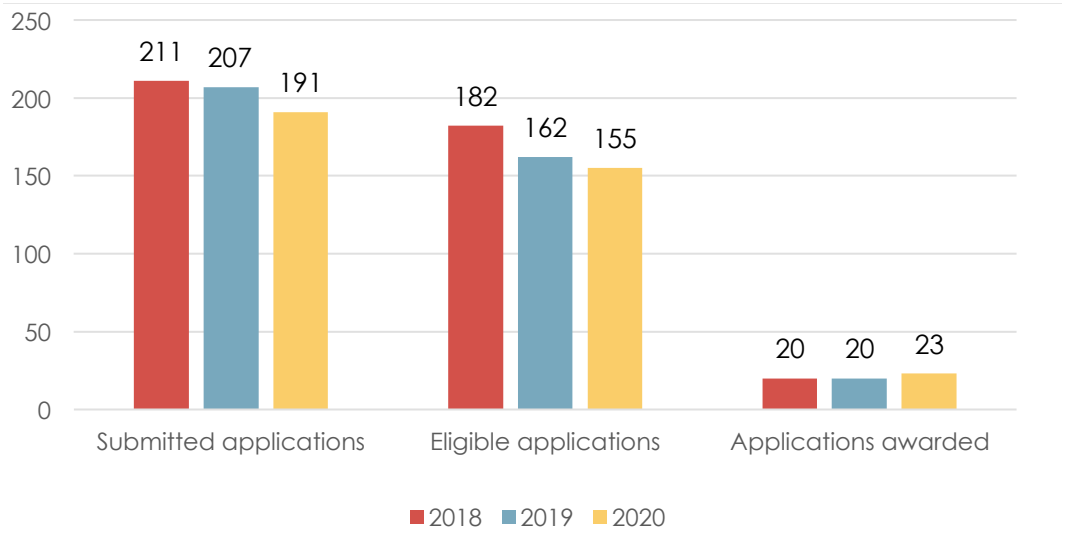
The EC fellowship is a prestigious award of up to USD 50,000 per fellow over two years, funded by Canada's International Development Research Centre (IDRC). The fellowship is offered to women scientists from STLCs who have completed their PhDs in STEM subjects within the last ten years and are already in paid employment as lecturers or advanced researchers at an academic or scientific research institute in one of the listed STLCs. Eligible expenses are research-related costs, linking with industry and other partners, and other outreach, communication, and networking activities. Additional support provided by OWSD is two training workshops per fellowship on how to manage the grant, leadership, outreach, and entrepreneurial skills. The EC Fellowship intends to encourage women scientists who have reached a post-doctoral stage to continue their research by providing them with the resources they need to continue functioning as scientists at an internationally competitive level, building research groups and centres, and passing on their knowledge and expertise. It also intends to facilitate the ongoing sustainability of research centres and hubs once IDRC funding is exhausted. EC fellows are supported in developing their leadership and management skills, as well as connections with a variety of public and private actors to facilitate the potential conversion of their research into marketable products.[11]

So far three calls for applications for the EC fellowship were launched. As illustrated in Figure 8, the number of applications received from the OWSD Secretariat has slightly decreased over the past three years. For the first two years over half of the applications came from LDCs, but for the last call this percentage was 43%.

[10] OWSD, 2017, Joint Proposal to IDRC and Sida.

[11] OWSD, 2017, Joint Proposal to IDRC and Sida, OWSD, OWSD Early Career Fellowship, https://owsd.net/career-development/early-career-women-scientists-ecws-fellowships [accessed 2021-05-06].

Figure 8 Applications for EC Fellowships 2018, 2019 and 2020.

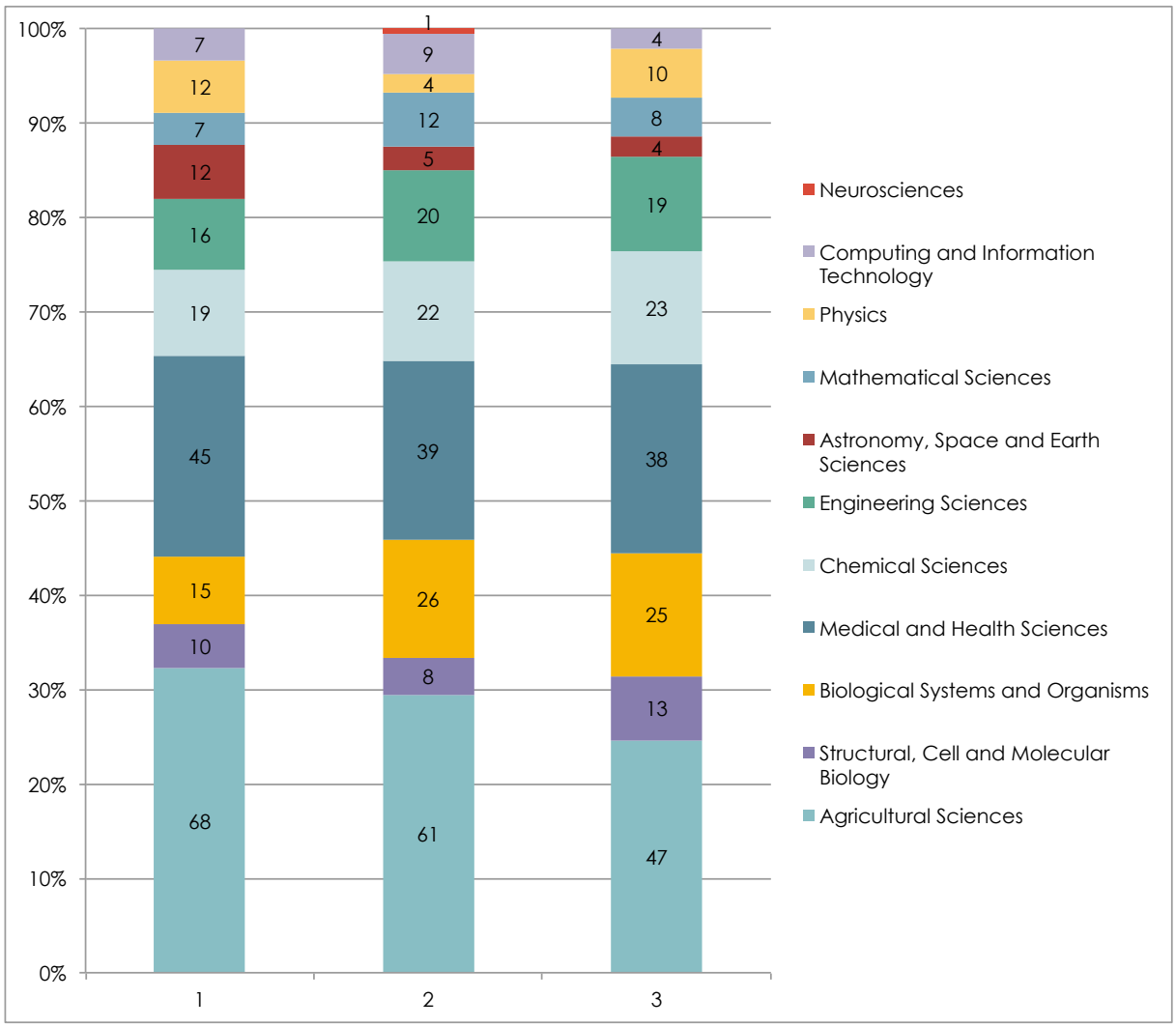


Source: OWSD Annual Progress Report 2020.

Over two thirds of applications came from Africa. Applications from Latin America & the Caribbean or the Arab region remain minor (under 5%). Overall, around 40% of the applications came from Anglophone Africa. The share of French-speaking African applicants in the period 2018-2020, is lower, and has actually been decreasing, from almost 30% in 2018 to 20% in 2020.

Figure 8 shows that applications in the field of agricultural science have been prominent but their number is progressively decreasing. On the other hand, applications in the field of mathematical sciences and biological systems and organisms have increased over the period.

Figure 9: EC fellowship applications, per discipline



Given the aforementioned origin of the applications from African and Asian countries, it is not surprising that the vast majority of the awardees come from African countries (more than 60% in all three years) and from Asian-Pacific countries. In 2019 two EC fellowship awardees came from LAC countries (one from Bolivia and another from Guatemala).

Chemical sciences, Biological systems and organisms, and Astronomy, space and earth sciences have the highest application success rates (14% for the three disciplines over the period 2018-2020). Mathematical sciences and engineering sciences have the lowest success rates (respectively 4% and 5%).

3 Evaluation findings

3.1 Effectiveness of the OWSD fellowship programmes

Evaluation Questions

- **Q1.1-To what extent is OWSD meeting its set and agreed on programme objectives?**
- **Q1.2-Are the set programme objectives being met at the individual (i.e. fellows) and the institutional (e.g. fellowships' host institutes) levels?**
- **Q1.3-To what extent is there evidence that suggests programme activities have contributed to the achievement of expected results realised to date? What are the main programme achievements and their specific contributing factors?**
- **Q1.4-What are the main programme shortfalls, and how to address them?**
- **Q1.5-What, if any, synergies exist between the various OWSD programmes? Where these synergies exist, what factors have made them possible?**
- **Q1.6-To what extent are programme stakeholders owners of the programme? How does this level of ownership compare with stakeholders' perceived or desired level of ownership and overall role in the programme?**
- **Q1.7-Where, if at all, is there evidence to suggest that programming activities led to gender-transformative outcomes to date? Where such change exists, how did this change come about? What factors appear to be important in realising gender-transformative outcomes?**
- **Q1.8- Any lessons learned emerging at this stage of the programme should be identified in order to inform future decision or actions**

3.1.1 Overall progress towards achieving expected objective

The evaluation finds that **the programme is in a good position to fully achieve its expected results**. OWSD, Sida and IDRC have defined a joint logical framework with specific indicators to measure performance against the programme's expected results. Data monitoring progress against these expected results shows that OWSD has performed well on a large majority of its indicators.

The effects of COVID-19 have hampered the implementation of many activities during 2020 and 2021. Nevertheless, budget neutral 6 months extensions have been granted on a case-by-case basis. This should allow PhD fellows from the 2017 and 2018 cohorts to complete their thesis.

The following paragraphs provide more details on the main achievements and main shortfalls of OWSD's fellowship programmes based on the expected outcomes defined in the programmes' logical framework.

3.1.2 Main programme achievements/outcomes

3.1.2.1 Strengthened OWSD administrative structure and systems to effectively and efficiently implement the programmes which in turn attract high quality applications.

A high number of interviewees stated, among major achievements, the **very effective management of the OWSD fellowship programmes by the Secretariat.**

"One of the main strengths of the OWSD programmes is their extremely competent team at the Secretariat and the experience gained from a long history" – OWSD stakeholder

OWSD has successfully set up a strong team of ten qualified and dedicated staff at OWSD Secretariat.

The Secretariat was strengthened with the recruitment of additional staff to manage and support the EC awardees in full synergy with the existing PhD programme. OWSD has established a well-defined organizational chart and clear roles and responsibilities for each staff member:

- Part of the team is responsible for the management and support of OWSD fellows under the supervision of the Associate Programme Manager and the Programme Coordinator.
- Other team members under the supervision of the Programme Coordinator manage communications, membership and external relations.

Feedback collected from fellows through interviews and survey data[12] confirm a very high level of satisfaction on the overall quality of the OWSD support facility (rated 4 or 5, where 5 is excellent by 94% of respondents). A high number of interviewed fellows underlined the strong involvement and responsiveness of the Secretariat and its ability to take on board feedback from fellows on difficulties encountered.

"They reach out constantly to understand our individual needs and to bridge any gaps." - EC fellow

The Secretariat also successfully established an **efficient infrastructure (File Maker) and clear processes for selection and support of fellows.** The online application system was fine-tuned and linked to the selection process. This has contributed to strengthen the application process and ensure that the selection process is transparent and systematically based on clearly defined rating criteria. Awardees' data collected during the application process is saved through this system and used to monitor progress and support fellows.

As illustrated in the table bellow, the Secretariat has successfully broadened and diversified the pool of reviewers mobilized for the selection of PhD and EC fellows. The mobilisation of actors from the Global South in the selection process and the strong representation of women was among best practices highlighted by interviewees.

Figure 10 Evolution of the pool of reviewers in the period 2018-2020

Year	No. of reviewers	No. of countries represented among the reviewers	% of reviewers based in the Global South	% of female reviewers
2018	10	2	0% (0 reviewer)	60%
2019	14	4	7% (1 reviewer)	43%
2020	35	18	60% (21 reviewers)	83%

Source: OWSD 2020 Annual Progress Report

Several stakeholders underlined the **impressive progress made in monitoring and evaluation of the two fellowship programmes**. The 'Evaluation of SIDA's Support to TWAS, OWSD and GIS published in July 2016[13] pointed out the lack of resources to analyse and learn from

12 A survey was conducted among the 2017-2021 cohorts. In total 127 responses were collected among which 110 reached the end of the questionnaire. This represents an overall response rate of 85%. Survey results are presented in Appendix B

13 'Evaluation of SIDA's Support to TWAS, OWSD and GIS: Final Report' by Stein Erik Kruse and Anamaria Golemac Powell, published July 2016

M&E data. The report recommended to hire an M&E consultant. An M&E consultant was hired for a year and has supported the Secretariat to design and implement new improved MEAL (monitoring, evaluation, accountability and learning) systems. The M&E consultant helped to link the monitoring of fellows' achievements to the donor's indicators and to structure the OWSD annual progress reports. The M&E consultant also supported in redesigning the layouts and standardizing the terminology used in the File Maker infrastructure. This has helped to build a stronger database on fellows that is used to report on progress. OWSD's communication and outreach teams also worked hard on enhancing the visual representation of M&E data in OWSD's annual progress reports.

"OWSD is able to present more comprehensive and granular data" OWSD stakeholder

The programmes' logical framework shows that OWSD is able to report on a rich range of indicators. Furthermore, the Secretariat uses its monitoring and evaluation data to support continuous learning. As an example OWSD was able to identify and assess the challenges faced by the 2018 EC cohort to obtain funding from their institutions and decided to provide advance payments up to 10% of the budget. Interviewed fellows appreciated this effort.

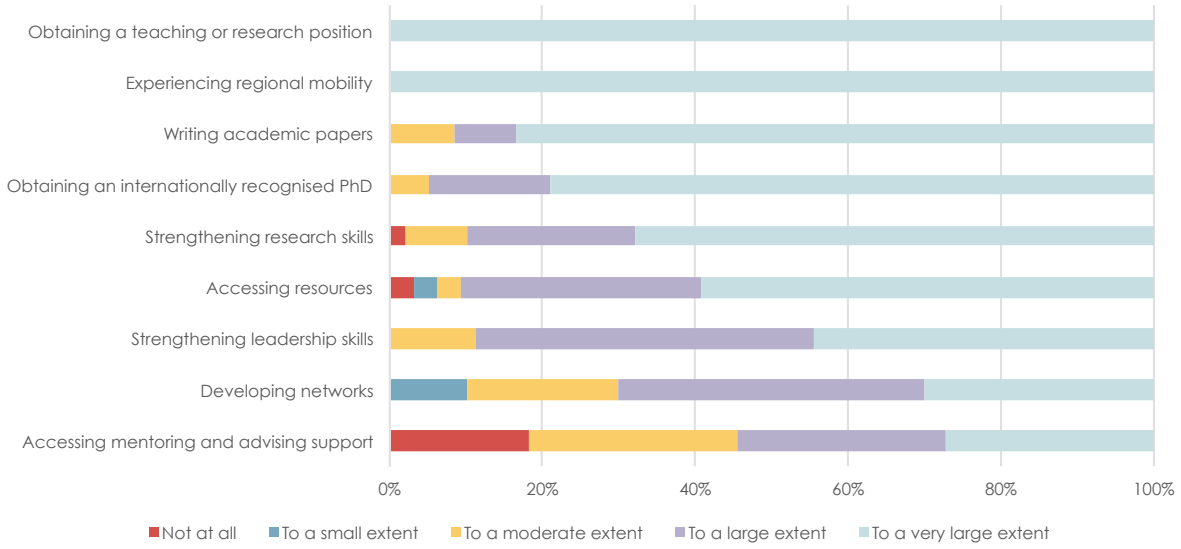
3.1.2.2 Individual awardees' capacity strengthened

Individual capacity strengthening is one of OWSD's major achievements highlighted by interviewees and survey data.

For PhD fellows, the programme supports the strengthening of their research, writing and science communication skills. PhD fellows also receive advice on their career development. About 68% of PhD fellows that have completed the survey rated positively the training opportunities experienced. Besides the figure below illustrates that OWSD has to a large extent met the capacity strengthening expectations of PhD fellows in terms of

- Writing academic papers (91%)
- Strengthening research skills (90%)
- Strengthening leadership skills (88%)

Figure 11 OWSD support in addressing respondents' expectations (n=55)



Several interviewed PhD fellows mentioned that they have been able to access laboratories in their host institute that are better equipped than what is available in their universities and have therefore gained skills and knowledge while using this technical equipment.

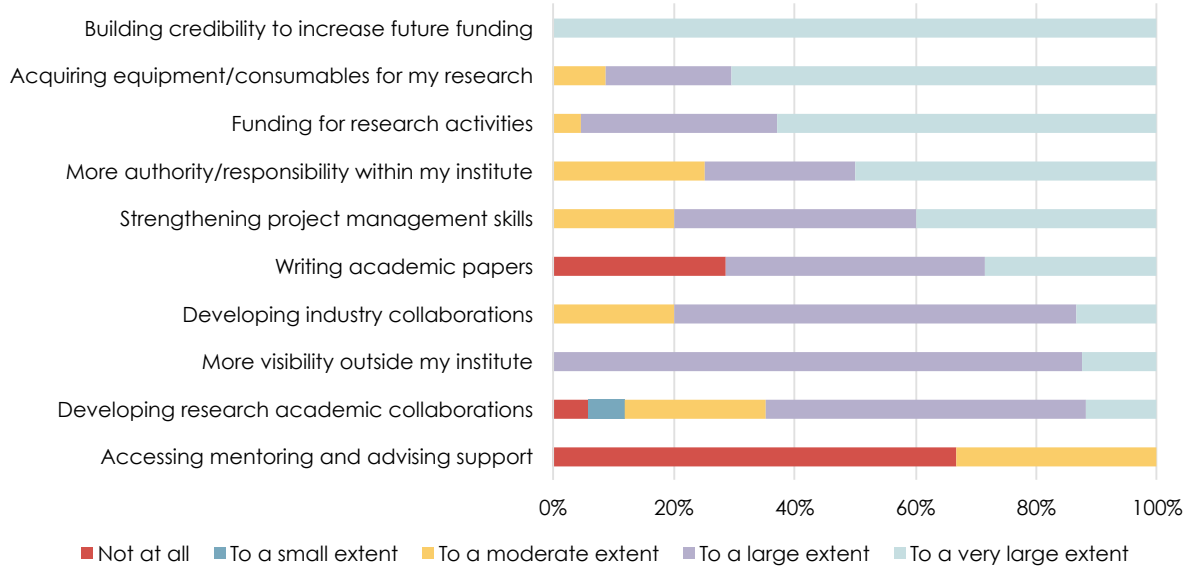
Interviewed PhD fellows and Alumnae mentioned other soft skills acquired during the PhD fellowship: teamwork, time management, adaptability, and ability to work in a multicultural environment.

For EC fellows, capacity strengthening activities focused on:

- Supporting fellows to develop their procurement knowledge and capacity, other research and programme management skills, offering mentoring, and online support.
- Supporting fellows in building their own and institutional capacities in establishing and enhancing partnerships between industry, private sector, local businesses and scientific institutions.

About 85% of EC fellows who completed the survey rated the training opportunities positively. And 73% rated the funding of training/capacity building for their research teams positively (rated 4 or 5 out of 5).

Figure 12 OWSD support in addressing respondents' expectations (n=49)



Best practices underlined by interviewees included the mobilisation of EC fellows from early cohorts for mentoring and advisory roles. We also note that the OWSD secretariat collected feedback from fellows in 2019 on the capacity strengthening opportunities provided. This has helped to take into account fellows needs in the design of training opportunities.

3.1.2.3 An OWSD network of over 7000 members

OWSD's network was emphasised as a strength and strong achievement by several interviewed stakeholders. Figure 13 displays the remarkable growth in OWSD members in 2019 and 2020.

There are three types of membership:

1. **Full membership** is restricted to women scientists from developing countries who have completed a master's or PhD degree in natural sciences (including engineering, technology and innovation) or social sciences and who are committed to the objectives of OWSD. Full members can vote in the OWSD General Assemblies to elect new members of the OWSD executive board.

2. **Affiliated members** are women scientists from developing countries who have completed a bachelor's degree (or equivalent) in the natural sciences (including engineering, technology and innovation) or social sciences and who are committed to the objectives of OWSD. Affiliate members can advance to become Full members upon completion of a master's degree (or equivalent) and, consequentially, will receive voting rights.
3. **Friends of OWSD** are women and men from developed and developing countries with at least an undergraduate degree (or equivalent) across all disciplines (including the natural sciences, social sciences, arts and humanities), who are committed to promoting the objectives of OWSD and who are not eligible for the Affiliate or Full membership categories. Friends of OWSD are encouraged to engage with OWSD and its members through support activities (mentoring, fundraising, networking, promoting).

Figure 13: Evolution of OWSD's new members per year[14] over the 2017-June 2021 period, per year and type

Type of membership	Pre-2017	2017	2018	2019	2020	2021 (first 6 months)	Total
Full members	1426	425	663	1396	1558	652	6120
Affiliate members	67	33	70	329	295	147	941
Friends of OWSD	55	12	22	71	75	31	266
Total	1548	470	755	1796	1928	830	7327

OWSD network covers 128 countries and a large number of disciplines. About 84% of OWSD's members are women with a PhD or a Masters in science subjects in developing countries[15].

The network growth is the result of enhanced communication & outreach activities, and great efforts on behalf of Executive Board members and fellows in the regions to recruit members and encourage National Chapter establishment. In some cases, individual OWSD members have been highly instrumental, e.g. in Guatemala.

The network offers inspiring opportunities for the establishment of an OWSD mentoring system. OWSD intends to mobilise OWSD members as mentors for the PhD and EC fellowship programmes.

A recent boom of memberships in Latin America offers many opportunities for the programme's geographical coverage of the region.

However these opportunities are currently underexploited because of limited resources for the network's activities, e.g. to host workshops and training sessions. All work undertaken by National Chapter members is voluntary.

[14] Between 2019 and 2020, OWSD performed a clean-up process with the aim of improving its membership database and ensuring that the members contact details were correct and that they had logged into their profile within the last year.

[15] Source OWSD 2020 Annual Progress Report

3.1.3 *Key results of the PhD fellowship programme*

Over the period 2017-2021 OWSD received 969 application and awarded 110 PhD fellowships among which 2 cancelled and 11 dropped out[16] during the programme. Among the **88 PhD active fellowships** two have graduated. Among OWSD's graduates from earlier cohorts, the average completion time was four years for full-time fellowship and 6.5 years for sandwich fellowships. Active fellows have been affected by the negative effects of the current COVID-19 pandemic and will need more time before they graduate.

The number and quality of applications received has steadily increased over the period 2017-2021. The number of eligible applications increased by 76% over the period and as a result the programme's acceptance rate dropped from 31% of eligible applications in 2017 to about 18% in 2020. Interviewees involved in the selection process acknowledge the increase in quality of applications received. This is partly attributed to the work done by OWSD's National Chapters to inform applicants on the call for proposals and eligibility criteria.

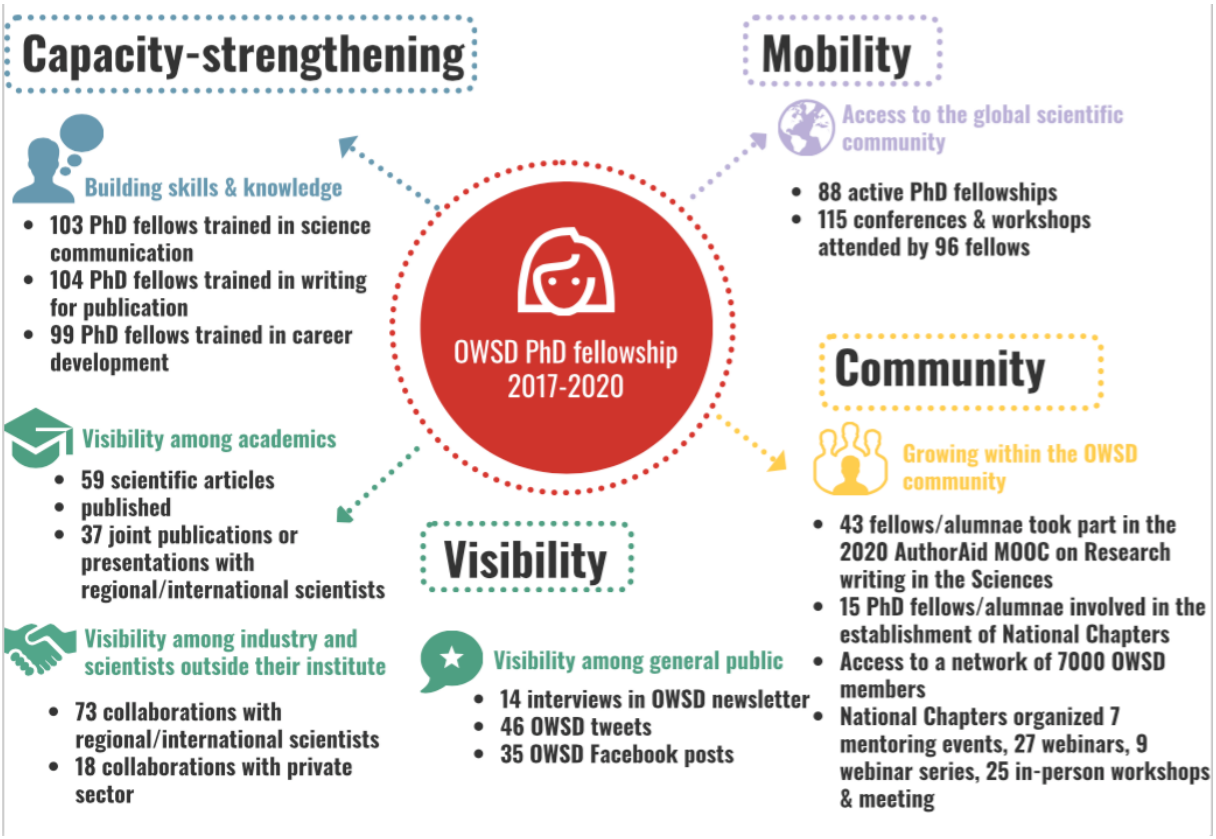
Since the beginning of the fellowship programme, OWSD has awarded a total of 524 PhD fellowships among which 306 (58%) have graduated. In other words, among the 414 PhD fellowships awarded before 2017, 73% have completed their PhD thesis, about 9.5% have dropped out and 17.5% are still completing.

The programme is therefore contributing to increase the number of women graduates with PhDs in STEM subjects from STLCs.

The figure hereafter aims to illustrate programme results for PhD fellows in terms of mobility, capacity strengthening, visibility and community.

[16] Fellows who dropped out initially accepted the award therefore some funding might have been disbursed. Reasons for dropping out of the programme are due to « family and personal issues » or « medical conditions », most of the time this occurs before travelling to the host institute and thus before any funds are disbursed.

Figure 14 Overview of key results of the PhD fellowship programme



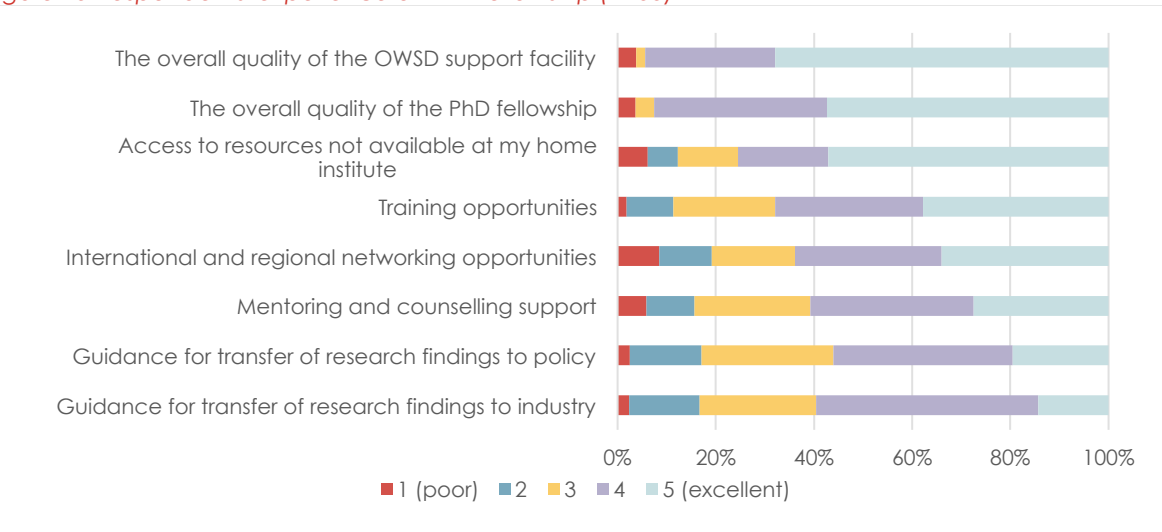
Source: OWSD reporting on logframe indicators

In addition to the indicators reported above, OWSD worked on negotiating an enabling environment and conditions with institutes and universities to support awardees to study and complete their PhDs. As a result a total of 9 MoUs were signed with host institutions in 5 countries and 5 additional MoUs are in negotiation phase.

OWSD reached and exceed target values defined for a large majority of its performance indicators on capacity strengthening, mobility and visibility of PhD fellows.

Survey results show high levels of satisfaction of PhD fellows with the overall quality of the PhD fellowship and the OWSD support facility. In Figure 15 positive responses appear in purple for experiences rated 4 and in light blue when rated 5 for excellent .

Figure 15 Respondents' experience of PhD fellowship (n=55)



Among areas of improvement suggested by interviewed PhD fellows:

- Several mentioned that they would like OWSD to be able to fund publications in international peer-reviewed journals
- A few mentioned that they would like OWSD to improve networking or mentoring support from OWSD alumnae
- A few would appreciate to have access to online digital libraries of academic journals such as JSTOR.

3.1.4 Key results of the EC fellowship programme

OWSD received about 610 EC applications to the three calls for proposals launched during the period 2018-2020 among which 499 were eligible (81%) and 62 awardees were funded (success rate of 12,4% of eligible applications).

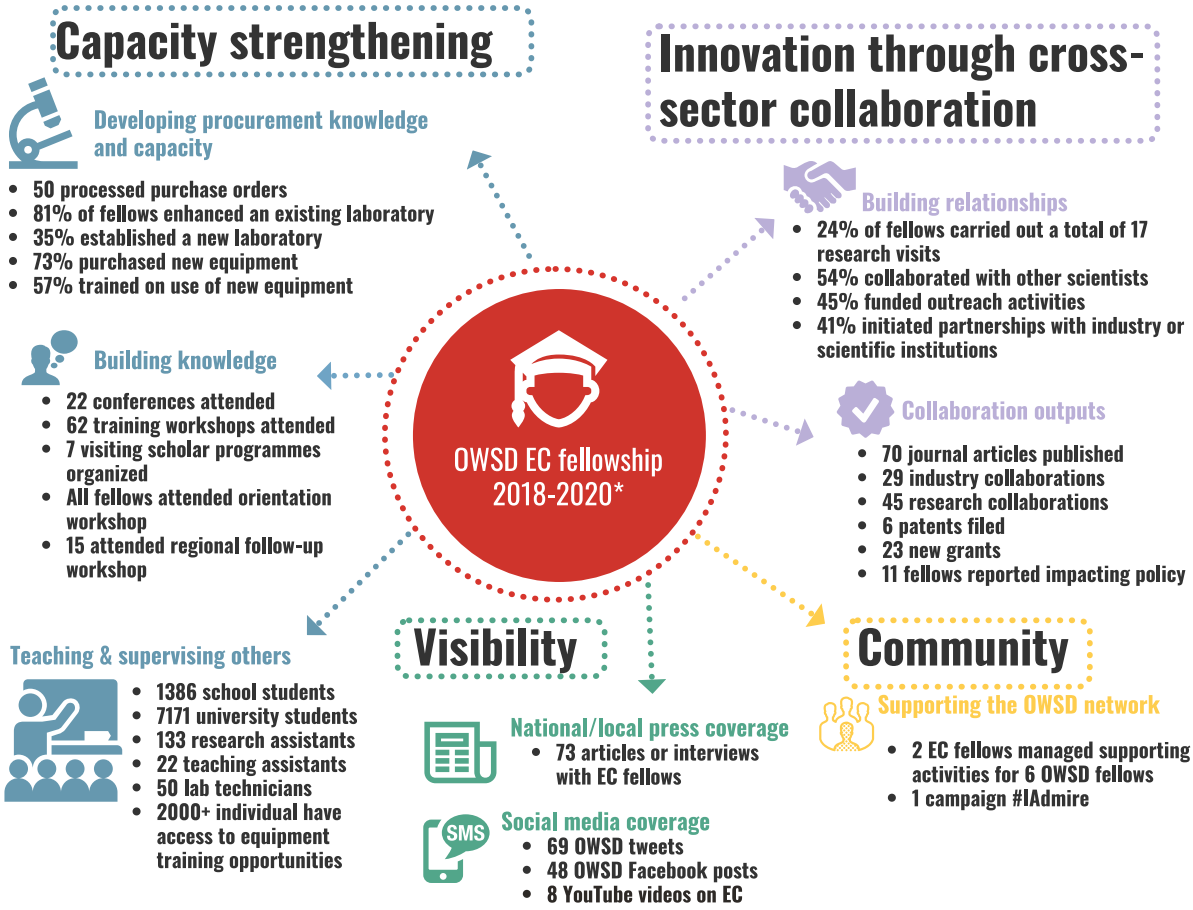
OWSD has executed 62 contracts using UNESCO's DUO system. A total of 53 MoUs were signed with 51 institutes. Three MoUs are pending counter-signature. The MoUs ensure that the EC fellow and its institution comply with UNESCO's rules and that the EC fellowship is aligned with the institution's internal rules. This process is complex and can take time before all parties reach an agreement and sign the MoU.

EC applications were received from an increasing number of countries (46 in total) and awardees covered 24 countries including two Latin American countries (Bolivia and Guatemala). As of December 2020, the programme counted 61 active Early Career fellows (only 1 dropped out). OWSD has therefore reached and exceeded its target value of 60 EC awards by 2021.

As mentioned in section 3.1.2.1, OWSD has successfully established an active Selection Committee with clear procedures and guidance for the selection of awardees. For the EC fellowship programme the selection process involves two reviewers per application since 2019. This offers a multidisplinary perspective in the review of the applications. The robust selection process together with the high number of applications received ensures the selection of high quality EC fellows.

The figure hereafter provides an overview of key results for EC fellows in terms of capacity strengthening, innovation through cross-sector collaboration, visibility and community.

Figure 16 Overview of key results of the EC fellowship programme from 2018-2020 cohorts*



Note(*): The figure mainly reflects results for the 2018 and 2019 cohorts. The 2020 cohort is launching its first activities.

Sources: OWSD 2020 logframe and OWSD 2020 Annual report

As illustrated in Figure 16 above, the **OWSD EC fellowship programme has achieved substantial results in terms of capacity strengthening**. Interviews with EC fellows pointed out that this capacity strengthening occurs at the individual level but also at the institutional level.

At the individual level, EC fellows attended trainings aiming to strengthen their procurement and project management skills, their leadership skills, their writing and science communication skills. In addition, many of them attended and/or organized conferences and training workshops. Interviewed fellows affirmed that they are using the skills acquired when writing scientific articles and when applying for other grants. They are also using their new leadership and communication skills when mentoring their students and attending conferences.

" I now have the confidence to attend international conferences." EC fellow

"I gained skills on how to better lead in research. I can deal with the administration involved, with conflicts, and with students underachieving." EC fellow

Data collected during interviews with EC fellows and programme stakeholders emphasized that **OWSD is also contributing to capacity building at the institutional level**, indeed:

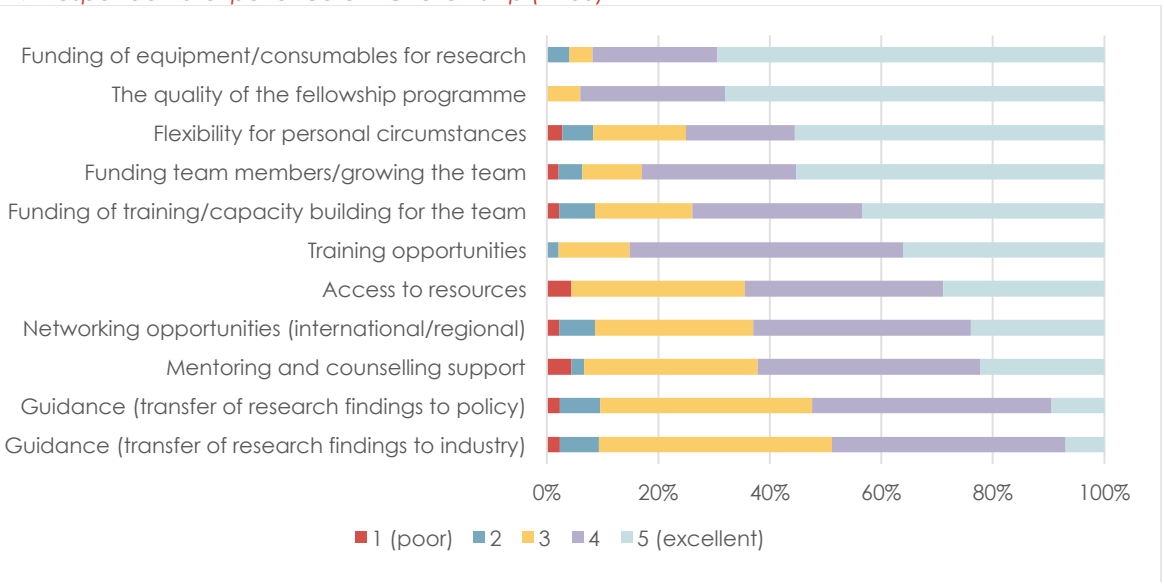
- EC fellows are using acquired skills when teaching and supervising a high number of students, teacher assistants and lab technicians within their institution. The knowledge acquired through exposure to the global scientific community and cross-sectoral collaborations is also transferred to the EC fellow's institution through teaching.
- Establishing a functional research laboratory and acquiring new equipment highly benefits the institutions. The equipment is the property of the institution and it is used by a high number of other students and other researchers at the university.
- African research institutions in STLCs are underfunded and having high quality equipment is an opportunity that gives them something to offer in research collaborations and when developing partnerships/MoUs with other institutions.
- The lack of resources also means that these institutions are severely under-staffed and work with exhausted scientists. Empowering an EC fellow with the opportunity to set up a research team and laboratory can contribute to ground-breaking research within these institutions.
- Establishing collaborations with industry also opens opportunities for the institution to learn on Intellectual Property issues and to build on the experience of the EC fellow to promote entrepreneurship.

A large number of interviewed EC fellows and OWSD stakeholders underlined that **OWSD's work in support of the visibility and recognition of fellows was crucial**. PhD and EC fellows affirm that the OWSD community has put them in contact with very "inspirational people" and has therefore helped to raise awareness on women's achievements in science. Interviewed fellows acknowledged the importance of the work done by OWSD through the increased use of social media and the development of videos, films, articles/interviews on PhD and EC fellows. They confirmed that these activities have a high impact on their visibility and recognition.

Interviewed EC fellows mentioned that the OWSD fellowship helped in terms of networking. They established new regional or international collaborations with academic and industrial partners. Several fellows mentioned that they are approached by other partners for collaborations. Results and impacts on these aspects are further described in section 3.3.4.

As illustrated in Figure 17, survey results display high level of satisfaction in all EC programme components. Areas that have received lower rates include guidance for transfer of research findings to policy and industry, mentoring support and networking opportunities.

Figure 17 Respondents' experience of EC fellowship (n=50)



3.1.5 Main difficulties encountered and shortfalls of the OWSD fellowship programmes

3.1.5.1 Main gaps in the programme's expected results

For the **PhD fellowship programme**, the evaluators see the main shortfalls under the objective of **an increased influence of women scientists from developing countries on national, regional and international science policy, curricula development, research design and implementation".** No collaborations with private sector/industry were reported for PhD fellows in 2019 and 2020. Besides, the indicators measuring the number of collaborations with international and/or regional scientists are not specific enough to demonstrate impact on science policy, curricula development, research design and implementation. Data collected during interviews with PhD fellows and alumnae does not demonstrate ability to influence science policy and/or industry. This mainly reflects the fact that PhD fellows are at a very early stage of their research career. At the moment OWSD has no tracer studies measuring how PhD Alumnae are influencing STI policy and research.

This objective is also challenging for EC fellows but some positive results are observed and further described in section 3.3.4.

For EC fellows, the main gap observed is on **the establishment of an online tutoring and mentoring system** to improve linking between female scientists in diverse scientific disciplines and countries to enable problem-sharing, solving and research and career development. However OWSD is currently exploring partnerships for the development of a mentoring programme.

Besides, interviews highlighted that several fellows are involved in mentoring activities with the National Chapters established in their country/region; and survey data shows that 48% of EC fellows declare that they have been involved in mentoring activities with fellows/alumnae of OWSD's funded fellowships.

3.1.5.2 Main difficulties encountered in the implementation of the fellowship programmes

3.1.5.2.1 Effects of the COVID 19 pandemics on activities planned in 2020 and 2021

The breakout of the COVID-19 pandemic has posed unforeseen challenges that have impeded the implementation of a number of activities and delayed others. Nevertheless the

Secretariat has been very active in collecting feedback from the fellows and scoping potential solutions.

In May 2020, the OWSD Secretariat prepared and launched a **survey targeting all ongoing fellows** and collecting 136 responses (approx. 80%). The vast majority (more than 70%) of respondents declared expecting their research activities to be delayed due to the COVID-19 situation. In June 2020, the OWSD Secretariat prepared and launched another **survey for all OWSD members**, to enquire about the effects of the COVID- 19 pandemic on their work, and especially on their research, as well as their facility life and mental wellbeing. The survey managed to collect 1470 responses from 85 countries.

The most commonly cited negative effects of the COVID-19 pandemic on work, research, or studies were: being unable to travel to conferences or other important work events (affecting 67% of respondents); being unable to perform experiments or field work (57%); being unable to provide teaching (31%); being unable to follow courses (22%); and the delay of pending publications (20%). Other negative impacts were the delay or suspension of ongoing funding (17%); difficulty finding collaborators (17%); being unable to submit funding proposals (16%); being unable to submit publications (14%); missing out on business opportunities or clients (13%); and being unable to take exams as scheduled (11%). These responses varied significantly by career stage, by discipline and by region.

Of factors contributing to negative effects, the most common were: inability to access the lab/office/ necessary equipment/ field work locations due to a lockdown (67%), reduced available working hours due to household or care responsibilities (44%); difficulty in effectively collaborating with colleagues (42%); lack of necessary equipment needed for effectively working or studying from home (42%); lack of a reliable internet connection to effectively work or study from home (41%); reduced access to teaching faculty and/or administrative staff (30%); and changes in institutional/departmental priorities (26%)[17].

These difficulties were also explained to the evaluators in the interviews conducted in the framework of the Mid-term evaluation. In addition, EC fellows mentioned delays in the procurement system caused by the effects of the pandemic and difficulties to procure laboratory consumables on time.

The ongoing pandemic clearly hampered progress of activities in 2020 and 2021 and OWSD Secretariat implemented a number of measures to adapt to the new situation and meet the needs of fellows, applicants and National Chapters. Mitigation measures include for instance:

- Given the long interruptions in studies and lack of financial support faced by female students' progress, in August 2020 the OWSD Secretariat adopted a "remote studies policy", which allows fellows to receive partial stipend support while continuing to study from home. Concretely, a small monthly grant of USD 200 is provided in those cases where the supervisor confirms that the fellow can continue to make progress at home and that supervision can be continued in an online setting. This remote study allowance is then subtracted from the grant already allocated to each fellow. At the end of 2020, six fellows benefitted from this remote studies policy scheme.
- Due to the COVID-19 pandemic, the **2020 Regional Workshop** for the PhD fellows (meant to take place at the same time as the OWSD General Assembly) was **put on hold** and its setting had to change. Based on the collaboration already established with AuthorAid and in addition to the online course for PhD fellows in "Research Writing in the Sciences" meant to start in July 2020, additional online training sessions from

[17] OWSD COVID 19 Member Survey- Full results

AuthorAid were planned for OWSD fellows. As a replacement of the 2020 Regional Workshop, all OWSD fellows were then invited to a **five-week online course** which covered a wide range of relevant topics (literature review, research ethics, writing a research paper, working towards journal publication). In addition, the OWSD fellows that registered for the course had access to a private "OWSD Classroom" where they were able to virtually meet other fellows. 65 OWSD fellows participated in the online course (38% of current fellows in 2020), 80% of whom completed the course.

- Given the pandemic, the **2020 orientation workshop for new EC fellows was moved online**, while the related regional follow-up workshop for the 2019 cohort was postponed to 2021 (date still to be determined). In addition, other online training course opportunities were offered to the EC fellows to support their professional development throughout the year. While having to postpone these training opportunities to later in 2021 (or beyond), the OWSD Secretariat searched for additional training opportunities for EC fellows from 2018 and 2019 cohorts. More specifically, two online events specifically for EC fellows were organised (the online course on Opinion Editorial Writing, in July 2020, by the Mawazo Institute in partnership with The Conversation Africa; and the online course "Research and Proposal Writing in the Sciences", by AuthorAid).
- Given that all international travel was limited or cancelled, and major international scientific events were also cancelled, OWSD PhD fellows were not able to benefit from the International Travel Grant component. By February 2020 the OWSD Secretariat put all conference attendance requests on hold. Later in the year, in agreement with Sida, it was approved to **use the International Travel Grant funds to cover virtual event participation as well as regional training activities**. For 2021, the **process allowing participation in online events has been further streamlined** to ensure that fellows continue taking part in international scientific gatherings in their new virtual setting.

In light of the pandemic and its impact on research activities, on a case-by-case basis, the OWSD Secretariat **accepted six months budget neutral extension requests from PhD fellows belonging to the 2017 and 2018 cohorts**. By the end of 2020, 25 PhD fellowship agreements (14% of all ongoing fellows) had been extended.

In 2020, the **call for applications of the EC fellowship** (opened at the beginning of March) **was extended** by two weeks in order to offer the applicants additional time to collect the relevant documentation. Moreover, the OWSD Secretariat developed a self-certification form allowing candidates to substitute specific documentation in case the relevant administrative offices were not accessible at the time to generate the requested original documents.

3.1.5.2.2 Complex administrative procedures and low support from home institutions

A high number of EC fellows stressed OWSD's **complex procurement procedures**. The three-quotation procedure is particularly challenging as EC fellows need to identify several sellers for the research equipment/material they want to acquire. The identified sellers should agree with the procedures and remain competitive as the basis of award is normally to the lowest priced, fully responsive and compliant quote.

As a programme unit of UNESCO, OWSD uses UNESCO's procurement procedure. UNESCO follows the Common Guidelines for Procurement by Organizations in the UN System. These procedures were designed to minimise the risks of misuse of funds. To reduce delays the OWSD Secretariat provides strong support to guide fellows through the process. This includes directly contacting sellers to explain the procedures. Interviewed EC fellows acknowledged this and are very grateful for OWSD's support. However they wonder if these procedures could be somehow simplified.

« Some of the procurement guidelines can be optimized to facilitate efficient research progress. Procurement activities are a bottleneck for conducting cutting-edge research in developing nations. While the opportunity to procure goods through OWSD facilitates these activities, the complicated procurement guidelines still hinder the efficient procurement of reagents and goods. » EC fellow

Addressing issues linked to procurement procedures is very time consuming for OWSDs staff. The fact that UNESCO often changes requirements for its administrative procedures worsens the situation. As a result OWSD's Secretariat often needs to contact staff at UNESCO's headquarters to understand how the changes apply to OWSD's programmes.

Despite having been awarded the OWSD grant, **EC fellows continue to face challenges to conduct their research in their institutions**. Interviews and survey data pointed out the following issues:

- Delays in procurement and lack of support from administrative officers for example to proceed necessary papers for reimbursements. In some cases these administrative issues notably affect project timelines.
- Heavy teaching workload due to low staff numbers. Despite having received the OWSD grant many EC fellows reported having insufficient time for their research activities.
- Lengthy process to get approvals before signing the MoUs and award agreements.
- Several fellows reported that their institutions were not in capacity to make advance payments (OWSD now allows advance payments up to 10% of award budget).
- Lack of provision of basic research material and equipment.
- Three cases of gender discrimination were reported.
- Two fellows mentioned delays in hiring staff to support their research.
- A fellow reported that her university was unable to ensure the maintenance of the purchased equipment beyond the period covered by the grant.

3.1.6 Contribution of programming activities to gender-transformative outcomes

OWSD's identity and focus on Women in Science in the Developing World places the organization in an ideal position to take into account the multiple vulnerabilities experienced by Women scientists in STLCs.

In addition to the numerous challenges faced by scientists from countries with weak research and innovation systems (lack of funding, poor scientific infrastructure, red tape, corruption, low interest of policy in scientific research, no stable power supply in the electric grid, etc.) women face additional obstacles, including but not limited to:

- Social stereotypes and the idea that science and STEM are fields for men. For instance some supervisors prefer working with male researchers.
- Social stereotypes and the idea that leadership positions are for men. This is compounded by the lack of visible female role models from STLCs demonstrating that it is possible to be a successful female leader in research.
- Difficulty in balancing family and work; a large majority of women in STLCs are solely responsible for childcare.
- Low support from their institutions for example to obtain flexible working time, and high levels of discrimination in getting promotions.

- Prevalent discrimination including when publishing.
- Insufficient gender balance and diversity in editorial boards.

OWSD's fellowship programmes are designed to take into account all of these barriers. OWSD's programmes are highly relevant to support women to overcome these challenges by increasing their self-confidence through capacity strengthening, giving them access to the funds, material and equipment necessary for their research activities, and providing access to mentorship to learn from their peers.

Women researchers in STLCs often face stigma and are seen as less credible than their male counterparts. **The OWSD programme was seen by EC fellows as very successful in terms of increasing the visibility of their research, and their profile in general.** This helped address issues of stigma. An interviewed EC fellow related how she used to apply for research funding with a male colleague who was listed as the PI, even though it was agreed between them that she would actually be the PI. She affirmed that she is now applying for research funding in her own right as PI and she was on the Vice Chancellor's list of her university for bringing in the highest amount of international research funding.

When increasing the visibility of female scientists in their research career, the program also paves the way for younger female researchers to follow in their footsteps. Over half of interviewed fellows stated that they themselves had first heard about the fellowship though other fellows and had been encouraged to apply, and were doing the same for other potential fellows. More indirectly, by increasing the visibility of female scientists and their research, the program could further contribute to changing norms concerning scientists. Many fellows stated that in their home countries women were not considered to be credible as scientists. As such, sharing the successes of the OWSD fellows via social media and the public press could change these negative views.

Several interviewees underlined that **OWSD's ability to generate role models for women scientists in STLC is very impactful**. A high number of EC fellows reported that their students feel inspired by their achievements.

"A student told me - professor I want to be like you - When I asked what she meant, she said she wants to have a PhD and be recognised and respected in the community" OWSD Alumnae & stakeholder

OWSD's work to enhance the visibility and leadership skills of its fellows is therefore crucial for the generation of role models.

A research career is very demanding on time. Women researchers in many STLC countries also have significant child and family care duties and they reported that the OWSD program really helped lessen the load in terms of help with childcare, administrative duties and other tasks to give them more time to focus on research.

"This went some way towards putting women on a more equal footing with their male counterparts." OWSD EC fellow

The 2016 evaluation of Sida's support to TWAS, OWSD and GIS had pointed out that OWSD's ability to take into account the needs of women scientists in packages offering childcare and research equipment support was weak in comparison with other programmes such as the ones offered by the Schlumberger Foundation and UNESCO-L'Oreal Fellowships for Women in Science. OWSD's 2017-2021 programming has successfully taken into account these evaluation findings. OWSD now provides funding for childcare. Survey results show that 75% of EC respondents rate their experience with the programme's ability to take into account their personal circumstances as 4 or 5 for excellent (see Figure 17) Nevertheless interviews with PhD and EC fellows pointed out that there is room for further flexibility. Interviewees mentioned that the COVID-19 pandemic has increased the care burden of women, and raised questions

on the programme's ability to take into account childcare or care for elderly or sick relatives in the fellows' country.

3.2 Relevance of the OWSD fellowship programmes

Evaluation Questions

- **Q2.1_To what extent are the programme objectives aligned with the broader organisational OWSD and UNESCO objectives?**
- **Q2.2_In what ways is the design of the OWSD programme suitable to addressing the development needs in STLCs?**

3.2.1 Alignment of the two fellowship programmes to OWSD strategy and UNESCO's objectives

The PhD and EC fellowship programs are fully aligned with the strategic goals and objectives of OWSD as described in the latest strategic plan 2017-2021:

1. To promote postgraduate education of talented young women scientists in developing countries (PhD fellowship programme)
2. To recognise, reward and showcase Early Career Women Scientists (OWSD-Elsevier Foundation Awards and EC fellowship programme)
3. To enable Early Career Women Scientists from eligible developing countries to continue to do advanced scientific research, become leaders and role models in science in their home countries and, when possible, make links with industry (EC fellowship programme)
4. Consolidate and expand OWSD's network in order to support OWSD members and disse minate OWSD programmes and activities. A Number of National Chapters are expanding with the support of PhD and EC fellows and Alumnae.
5. Develop Partnerships with other Organizations and consolidate existing partnerships (eg. TWAS, IAP, ICTP, AuthorAid)
6. Design and Develop Gender Transformational Activities
7. Ensure that all OWSD fellows are aware of the SDGs and include reference to SDGs in teir research outlines when possible
8. Improve Management, Administration and Operational Methods
9. Promote and organize Leadership Development Workshops
10. Promote awareness of the Sustainable Development Goals (SDGs)

Besides, OWSD activities are highly aligned with the missions of UNESCO's Natural Science sector, aiming to:

- Act as a platform for sharing ideas and standard setting
- Catalyse international cooperation in science
- Promote dialogue between scientists and policy makers
- Build capacity in science

Furthermore through its fellowship programmes OWSDs highly contributes to the two overarching priorities of UNESCO: Africa and Gender equality[18]:

- OWSD's support is geared towards supporting individual needs of women scientists who otherwise might not have continued their scientific career in their country. OWSD's experience and knowledge make it uniquely positioned to support women scientists and therefore contribute to gender equality in science in the developing world.
- Over 70% of PhD fellowships and 60% of EC fellowships are awarded in African countries. Besides 51% of OWSD members are based in the African continent.

OWSD fellowship programmes contribute to the narrowing of the scientific gap between countries in particular through capacity building at individual but also institutional level.

OWSD fellowship programmes contribute to capacity building in basic sciences as a prelude to applied sciences but also support capacity strengthening in applied sciences and technological advancement as a means to address the development challenges in STLCs. As such the organisation contributes to UNESCO's umbrella objective of equitable and sustainable development.

Through its mobility component OWSD promotes "international cooperation in science". PhD fellows have the opportunity to undertake PhD research in STEM subjects at a host institution in the Global South. They are also offered access to the global scientific community though conference travel grants. In addition OWSD promotes the visibility of research undertaken by its PhD and EC fellows and as such strengthens the credibility and recognition of research carried out by its fellows within and beyond its network of 7000 OWSD members. This is particularly important to enhance research collaborations at international level. Scientists from STLCs do not have highly equipped laboratories or renowned institutions to use as selling points when they approach other scientists for collaborations. The visibility and credibility that the OWSD and the UNESCO labels offer to their research is key to unlock new scientific collaborations.

OWSD Secretariat and its network of National Chapters share ideas and set standards for quality research through the workshop, trainings, and conferences provided to fellows. OWSD could strengthen its role of platform for sharing ideas and standard setting through the establishment of an effective mentoring system.

OWSD's fellows and in particular EC fellows are highly encouraged to engage with policy makers with the aim of effectively transferring results of their research into policy. The evaluation shows that several EC fellows were significantly engaged in policy outreach activities and some provided contributions in the definition of STI or sectoral policies in their countries. The policy uptake of ongoing EC research is difficult to measure at this early stage.

3.2.2 *Alignment of the two fellowship programmes to the development needs in STLCs*

3.2.2.1 Relevance of the classification of countries eligible for the two fellowship programmes

OWSD PhD and EC programmes are made available only to a restricted number of developing countries. A new list of eligible countries was developped by TWAS in 2017 and includes countries in which science and technology are significantly lagging[19]. The criteria for

[18] UNESCO Priority Gender Equality Action Plan: 2014-2021

[19] Formerly, OWSD had a list of eligible countries which included all Least Developed Countries (LDCs) and any additional countries in sub-Saharan Africa. With this new selection, some countries in Africa

the selection of the 66 STLCs eligible for the PhD fellowship and the 60 countries eligible for the EC fellowship are not fully clear. For instance, OWSD members in Nigeria do not understand why their country is not eligible anymore and interviewees have pointed out that they would appreciate furher information on the criteria and indicators used to select eligible countries.

Another point was raised by staff at the OWSD Secretariat regarding the importance of also taking into account gender aspects in the selection of countries. At the moment eligibility criteria used by the Donors and TWAS seems to focus on the Human Development Index and countries' Research and Innovation Performance. In addition to these criteria, it would be important to consider specific gender equality indicators. For example, the UNESCO STEM and Gender Advancement (SAGA) Toolkit defined an indicator matrix20 considering social norms and stereotypes, STEM primary and secondary education, STEM uptake in higher education, career progression, research content, practice and agendas, policy making processes and entrepreneurship and innovation.

3.2.2.2 Relevance of the OWSD fellowship programmes to the development challenges in STLCs

The design of the OWSD fellowship programmes is highly relevant to the development needs in STLCs.

The PhD fellowship programme focuses on capacity strengthening in fundamental sciences which are crucial to help understanding some major development challenges linked to climate change and health for example. The Global South has recently faced several emerging diseases such as the Ebola epidemic, the Zika virus and now the COVID 19 that require sound capacities in basic sciences to understand and address the situation locally. To mitigate the effects of climate change, scientists from all over the world are needed to provide knowledge and inform policy on upcoming challenges linked to scarcity of water, loss of biodiversity, food security, heat waves, flooding and other natural disasters. As such by supporting fundamental research in STLCs OWSD's support goes beyond economic value.

"The PhD fellowship programme is building new knowledge in developing countries and therefore strengthening societies in these countries." OWSD stakeholder

The EC fellowship is more oriented towards applied research addressing existing development needs. The majority of the fellows' research is closely linked with advancing SDGs 2 (Zero Hunger), 3 (Good Health and Well Being), 13 (Climate Action) and 15 (Sustainable Development). Overall, the fellows report that 13 of the 17 SDGs are addressed in their research[21]. In addition, through its mandate OWSD contributes to SDG 5, SDG4 and SDG17.

In terms of thematic coverage, some STEM fields attract a low number of quality applications. Applications in mathematics have a low success rate and it is challenging for OWSD to better cover this field given that the gap is more in the quality of applications than in the number of applications received. For applications of equal quality OWSD will prioritise in the selection process the applications in scientific fields that are under represented. However increasing

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are no longer considered low income and are no longer eligible for fellowships support. Some new countries outside Africa have been added.

[20] https://unesdoc.unesco.org/ark:/48223/pf0000259766_eng)

21 Source: OWSD Annual Report 2021 and EC progress reports.

the number of quality awardees in mathematics cannot be done without enhancing the quality of mathematics education in STLCs. This is beyond OWSD's mandate.

3.3 Sustainability and impacts of the OWSD fellowship programmes

Evaluation Questions

- **Q3.1- What specific aspects of the OWSD programmes contribute to the potential continuation of the results after its completion? Are there aspects that could be improved or further activities added to better support sustainability?**
- **Q3.2 - What progress has been achieved for the financial sustainability of the fellowship programmes (particularly the Early Career strand)?**
- **Q3.3- To what extend the results achieved to date (if any) in terms of institutional capacity building are going to be sustainable over time?**
- **Q3.4- How have OWSD National Chapters supported the development of the OWSD funded fellowships programs and their fellows and alumnae, and vice versa? Since the membership and chapters will likely figure prominently in future projects, evaluating their role in OWSD will be crucial.**

3.3.1 Financial sustainability of the fellowship programmes

Several stakeholders pointed out the financial sustainability of OWSD's fellowship programmes as an important weakness. The two fellowship programmes rely on funding from their major donors Sida and IDRC. **If the donors were to stop their funding, OWSD's fellowship programme activities could not continue.**

In the long term the continuation of the EC fellowship is at risk. IDRC sees its investment as a pilot or proof of concept effort that should be continued by other donors.

Financial sustainability of OWSD's activities raises questions linked to its governance model and OWSD's capacity to raise its own funds independently.

OWSD does not have decision making power/approval power over various aspects of its operation including the ability to raise funds independently. OWSD has its own governing body, but the ultimate decision-making power lies with the Executive Director of TWAS.

Funds from donors go through a "special account" that receives funding for both TWAS and OWSD. Special accounts are created to receive funding for clearly defined objectives and within the overall strategy of extra-budgetary funding in UNESCO. The evaluators see a conflict of interest here as TWAS also offers PhD fellowships for women in developing countries. An illustrative example is the IsDB-TWAS Postdoctoral Fellowship Programme for Women. This postdoctoral programme targets Early-career female researchers from 21 least developed member countries of the Islamic Development Bank (IsDB). OWSD could have managed this programme directly given its mandate, expertise and experience. This could have helped to strengthen OWSD and reduce the heavy dependence on a few donors. The fact that this fellowship programme is managed by TWAS creates confusion in the understanding of the distinct identities and mandates of TWAS and OWSD. Besides it can be confusing for donors to understand OWSD and TWAS governing and funding mechanisms.

These governance issues are embedded in the history of OWSD. The 2016 evaluation of Sida's support to TWAS, OWSD and GIS had already stressed that OWSD's fundraising activities were limited due to its status and that fundraising will remain problematic for OWSD until the status and roles of the two entities are clarified. The report also mentions that back in 2013, it was discussed to convert OWSD into an NGO. UNESCO would then be able to sign an agreement with the NGO. However, the preferred option was to employ the personnel of OWSD as

UNESCO staff[22]. The evaluators believe that to solve the persistent governance issues, the advantages and inconveniences of choosing an independent status should be considered by OWSD.

3.3.2 *Sustainability and impacts of results on individual and institutional capacity strengthening*

Capacity strengthening impacts on EC fellows are very likely to be sustainable. EC fellows declare they are using the gained skills and knowledge when publishing, attending conferences and applying for research grants. Survey results show that a large majority of EC fellows applied for research grants from national and international institutions either as principal investigator (respectively 53% and 75%) or as part of a team (68% and 57%). Many of the EC fellows have managed to secure continuation funds/grants for their projects, so they will be likely to build on their acquired capacities and expand them in the future.

It is interesting to note that **impacts and sustainability of new equipment** are enhanced by the fact that the equipment is the property of the institution and therefore supports the institution's capacity to conduct research, but it is the responsibility of the EC fellow to look after the equipment and ensure it is maintained.

PhD Fellows are using their new skills to complete their PhD thesis. It is more difficult to affirm that these skills will be sustained as it will be more challenging for them to carry on research activities in their countries straight after their graduation. They are at an early stage of their career and lack solid track records in research to attract funding for research activities. Their experience is not strong enough for eligibility to OWSD's EC fellowship programme. Without support there is a risk that some of them end up tied up in teaching activities, or see better career prospects in other sectors or abroad. Nevertheless, preliminary findings from a study[23], endorsed by the OWSD Secretariat, aiming to evaluate the impact of the PhD fellowship on the publication record of fellows themselves, and whether there are any spill overs on the publication records of their home country peers show interesting development. The study finds that OWSD PhD alumnae tend to publish more in the 6 years after the fellowship then applicants who did not receive the fellowship.

PhD fellows would benefit from mentorship from EC fellows or other OWSD members to learn about existing opportunities for young researchers, for example the TWAS postdoctoral fellowships. The OWSD training package provides workshops on career development to support them on these aspects.

Impacts of capacity strengthening results on individuals and their institutions could be better captured by OWSD M&E data. For example it would be interesting to better capture to what extent capacity strengthening leads to high quality research and publications. OWSD's annual progress report and OWSD logframe measures the number of published journal articles with no reference to the quality of the journal. The 2018 results refer to "peer-reviewed publications in international journals", but in 2019 and 2020 M&E data only refers to "number of publications". OWSD is working on improving this and is exploring collaboration with Digital Science that will help to create CVs for OWSD members and list publications with their DOI numbers. It would be interesting to specify the number of publications in Scopus-referenced journals as this provides a solid indicator on the quality of the publication[24]. OWSD intends to

[22] Evaluation of Sida's support to TWAS, OWSD and GIS 2016

[23] Fry, CV and Furman J., "Migration, Institutional Context, and Global Network Formation: Evidence from female scientists in developing countries", working paper 2021.

[24] SCOPUS excludes publications from poor-quality and predatory journals.

feature additional aspects illustrating quality of research, for example explaining how national/regional publications can have impact locally, and what aspects of science and research women do better than men. OWSD secretariat has started exploring innovative tools to better capture impacts of research conducted in a one-page view profile of fellows.

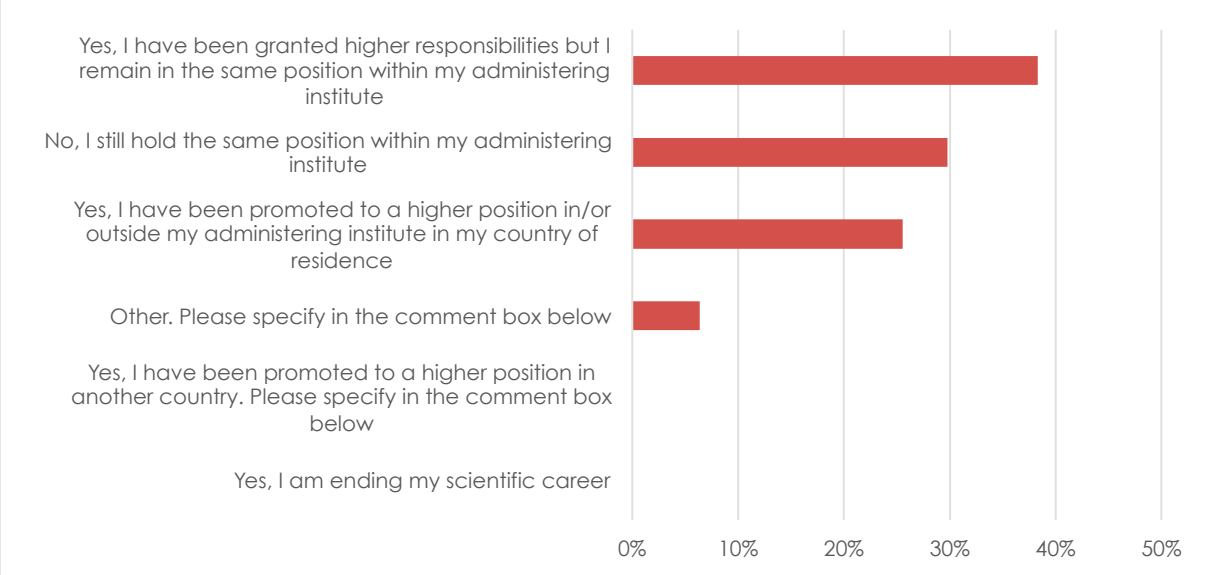
OWSD's M&E data does not measure sufficiently results of capacity strengthening at institutional level. As illustrated in Figure 16 EC fellows strongly contribute to building knowledge and skills in their institutions. The acquisition of new equipment and/or a new laboratory also benefits other students and researchers in the institution. OWSD could better capture and communicate these results. In the future, it can use tracer studies to verify with EC fellows if their institutions were able to ensure the maintenance of the acquired equipment.

Preliminary results of the above mentioned study on impact of the PhD fellowship on the publication record of fellows themselves finds that scientists working in the home institution, in the same scientific field, of the successful PhD fellows tend to collaborate more with the host country institution than those working in an institution with an unsuccessful fellow. It also finds that the latter relationship is strongest when the PhD fellow comes from a home country with high levels of gender parity, and goes to a host country with high levels of gender parity[25].

3.3.3 *Impacts on career progression of EC fellows*

Interviewed EC fellows were confident that the program would help progress their careers, and mentioned that they gained respect and recognition within their institutions and/or within their scientific field. Survey data shows that about 70% of EC fellows declared that they were either promoted to a higher position or have been granted higher responsibilities but remain in the same position[26].

Figure 18 Respondents' situation since EC fellowship (n=47)



[25] Fry, CV and Furman J., "Migration, Institutional Context, and Global Network Formation: Evidence from female scientists in developing countries", working paper 2021.

[26] The 70% includes the 6% of respondents that chose other as all of their comments refer to new positions or new responsibilities (See detailed survey results in Appendix B)

Besides for survey respondents who declared having obtained higher positions or responsibilities the three main factors they considered as important in obtaining these positions/responsibilities are:

- The research conducted under the OWSD EC fellowship
- The number of publications or patents
- The capacities strengthened under the OWSD EC fellowship programme

It is interesting to note that in Figure 18 none of the EC fellows declared that they intend to end their scientific career or that they have accepted a position abroad. This demonstrates that OWSD is supporting EC fellows to pursue their scientific careers in the Global South. This is confirmed through interview data as many EC fellows stated that they wouldn't have been able to carry on research activities in their country without the fellowship. These results would need to be monitored a few years after the EC fellowships to verify if they are sustainable.

Further, most EC fellows were confident that their career success would be sustainable- the program had helped them achieve sufficient visibility and credibility via publications, increased networks, improved research skills, and the esteem associated with the OWSD fellowship itself. Several fellows have already won additional research funding and felt confident their career success would continue.

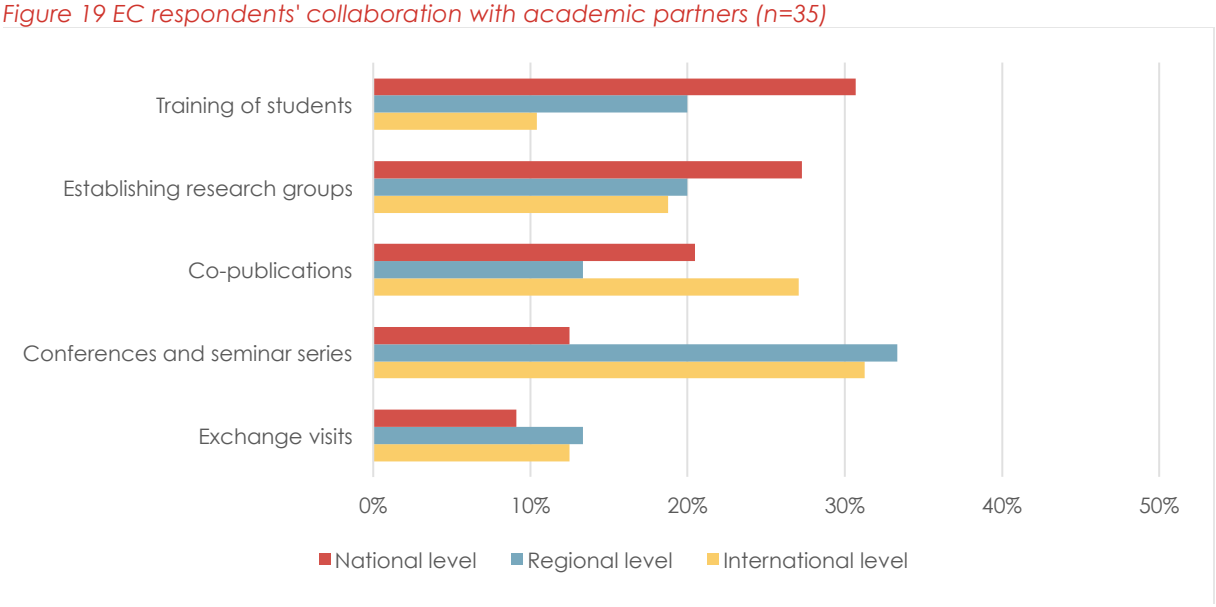
"The fellowship led to a snowball effect of successes". EC fellow

3.3.4 Impacts on the development challenges of STLCs

OWSD aims to support women scientists realizing their scientific potential and contribution to the development of their countries. Many interviewed EC fellows had obtained their PhD abroad. They then desired to return to their home country to work in research, but experienced disappointment on re-entry at the stigma faced by female researchers, at the insufficiency of the research equipment and the lack of funding. The OWSD EC fellowship had addressed all these needs and allowed them to pursue their research career with funding, equipment and a network of advisors and peers.

OWSD supports the visibility of fellows with the objective of having more women scientists that influence science and technology policy at the institutional, national and global level. Survey results show that 51% of EC respondents were able to establish new collaborations with academic partners within the framework of the EC grant. Figure 19 illustrates that these collaborations involve activities at the national, regional and international level. Co-publications have been particularly high at international level, and EC fellow collaborated with academic partners in conference and seminar series mostly at regional and international level.

Figure 19 EC respondents' collaboration with academic partners (n=35)



Featuring EC fellows for example in local media strengthens their credibility and thus ability to influence policy. Instruments such as the OWSD-Elsevier Foundation EC award also support this objective. However translation of research results into policy takes time and cannot be measured yet for ongoing EC fellows.

Besides the power and influence that individual team members have on policy is limited. For this reason it is important that OWSD activities engage effectively with policymakers.

Nevertheless survey data displays some interesting figures in terms of policy influence that happened after the fellows have been awarded the EC fellowship:

- 41% of EC respondents declare that they have been invited to participate in committees by the ministry responsible for STI in their country
- 26% affirm that they were consulted, or participated in the drafting of the overall STI policy or sectorial STI policies in their country
- 35% participated in governing councils at their administering institute
- 45% have been asked to provide advice on their fields of expertise for policymaking outside the STI policy institutions (such as other ministries or government agencies)

OWSD's activities inspire more women scientists to act as independent inventors and entrepreneurs in their countries. EC fellows are conducting applied research, many have found industrial applications for their research, that addressed problems encountered in developing countries (an app to detect poultry disease, an early diagnosis test for dengue fever, etc.), broadening significantly the impact reach of their research findings.

Interviews with EC underlined that while some fellows welcomed the opportunity to initiate industrial collaborations (and had applied for the OWSD fellowship because of opportunities in this respect), others were initially hesitant but finally understood the importance of industrial collaboration and were supported by OWSD in doing so.

About 35% of EC survey respondents declared that they were able to establish collaborations with industrial partners. These collaborations involved the implementation of activities displayed in the figure below.

Figure 20 Respondents' collaboration with industrial partners (n=24)

Survey and interview data reveal that the main barriers encountered to establish collaborations with industry are:

- Time available for the development of collaboration with industry. EC fellows have a heavy teaching load and already very limited time for research activities. It is not easy to find time to establish collaborations with industry. An EC fellow mentioned that she was using her annual leave to make progress on collaboration with industry.
- The effects of the COVID-19 pandemic that has postponed some visits and discussions with industrial partners in particular when the identified partners are based abroad.

Among the enablers for collaboration with industry EC fellow appreciated support from OWSD to prepare meetings with industry and address issues of Intellectual Property.

Some fellows indicated that mentoring support would be helpful to learn from experience of other researchers that had successful results with industrial partners. Others suggested training to develop their entrepreneurial skills.

4 Conclusions and recommendations

4.1 Conclusions

OWSD is well-positioned to complete all its intended objectives as stated in the Sida-IDRC proposal 2017-2021. OWSD has met and periodically exceeded target values for a large majority of its performance indicators.

In 2017 and 2018, the Secretariat invested time and energy in recruiting additional staff, reorganising the team, and designing effective implementation infrastructure for the application, selection, and monitoring of fellows. This delayed the launch of the EC fellowship programme but contributed to establishing very effective management of the OWSD fellowship programmes. All stakeholders interviewed in the framework of this evaluation acknowledged the professionalism and strong engagement of staff at the Secretariat. Besides, the Monitoring and Evaluation of the fellowship programmes was enhanced. Overall outputs and outcomes are well tracked, and feedback reported is used to improve the programmes.

Among key achievements is OWSD's contribution to the capacity strengthening of PhD and EC fellows (writing skills, research skills, leadership and communication skills, project and budget management skills). OWSD delivered all training activities and workshops according to plans and set up mitigation strategies to deliver online courses to overcome the travel restrictions due to the COVID 19 pandemic. Interviews and survey results emphasise the high level of satisfaction of fellows concerning training opportunities offered by the OWSD fellowships. Interviewed fellows feel empowered in their capacity to conduct research, publish, teach and develop new collaborations.

Programme objectives in terms of capacity strengthening are being met at the individual level, but the EC fellowship programme also contributes to strengthening fellow's institutions. Trained EC fellows assert that they are using acquired skills when teaching and supervising a high number of students, teacher assistants and lab technicians within their institution. Acquired research equipment is the institution's property, and it is used by a high number of other students and other researchers at the university. Enhanced visibility of the research performed by the EC fellow contributes to the visibility of the institution and opens doors for collaborations at national, regional and international level. Finally, collaborations developed with industry offer opportunities for the institution such as knowledge transfer, capacity strengthening in IP management, possible internship and job opportunities for students.

Effects of the COVID-19 pandemic were stated among the major difficulties encountered by the OWSD fellowship programmes. Restrictions due to the pandemic have hampered the implementation of some activities and delayed others. As a result, the programme counts only two PhD graduates from the 2017 cohort. Nevertheless, OWSD is confident that many awardees will be graduating within the average completion time. A six-month extension was granted on a case-by-case basis for 14 fellows from cohorts that started in 2017 and 2018.

Among other important difficulties emphasised, EC fellows mentioned OWSD's complex procurement procedures. OWSD applies UNESCO's procurement procedure, and UNESCO follows the Common Guidelines for Procurement by Organisations in the UN System. These procedures were designed to minimise the risks of misuse of funds, but in the context of STLCs, they can significantly delay research activities. OWSD Secretariat provides strong support to guide fellows through the process and limit the impediments.

Many EC fellows highlighted remaining challenges to conduct research in their institutions despite being awarded the EC grant. These challenges are mainly due to the high teaching workload and complex administrative procedures in their institution or country.

The evaluation finds that the fellowship programmes are highly aligned to the objectives set in OWSD's strategy. They also strongly contribute to the missions of UNESCO's Natural Science sector and the achievement of UNESCO's priorities for Africa and Gender Equality.

Besides, OWSD's fellowship programmes are relevant to the development needs of STLCs. They contribute to capacity strengthening of basic and applied research in focus countries. EC fellows consider that their research contributes to the achievement of at least 13 of 17 SDGs and in particular to SDG 2 Zero Hunger, SDG 3 Good Health and Well-Being, SDG 13 Climate action, and SDG 15 Life on land. Additionally, OWSD's mandate contributes to SDG4 Quality Education, SDG5 Gender equality, and SDG 17 Partnerships for the Goals.

A few interviewees pointed out the need to re-assess and clarify the programme's country eligibility criteria. The evaluators understand that eligibility criteria take into account indicators such as countries' research and innovation performance but do not consider gender equality indicators.

OWSD programming activities contribute to gender-transformative outcomes. They are designed to take into account the multiple vulnerabilities experienced by women scientists in STLCs. They help women overcome existing obstacles by increasing their self-confidence through capacity strengthening, giving them access to the funds, material and equipment necessary for their research activities, and providing opportunities to learn from their peers.

EC fellows saw the programme as very successful in increasing the visibility and credibility of their research. This helped to address issues of stigma and to pave the way for younger female researchers to follow in their footsteps. Several interviewees underlined that OWSD's ability to generate role models for women scientists in STLC is very impactful. A high number of EC fellows reported that their students feel inspired by their achievements.

The evaluation also notes that the programme has improved its ability to cover childcare support. However, the COVID 19 pandemic has increased women's caring responsibilities and questioned the programme's ability to cover support for elderly and ill dependents.

The evaluation identifies major risks in the programme's financial sustainability linked to OWSD's governance model and its ability to control its resources independently.

OWSD and TWAS share a special account at UNESCO that receives funding from donors for both TWAS and OWSD. However, TWAS Executive Director has stronger decision-making powers given by his position. OWSD managing director holds the position of "Programme Coordinator" and therefore has a lower decision-making authority level. This is an issue because the evaluators see a conflict of interest with TWAS illustrated by the recent IsDB-TWAS Postdoctoral Fellowship Programme for Women. This postdoctoral programme targets Early-career female researchers and could have been managed directly by OWSD. Its implementation by TWAS creates confusion in the identity of the two organisations.

OWSD fellowship programmes are very likely to have continued results for fellows after the completion of their fellowship. EC fellows declare they are using the gained skills and knowledge when publishing, managing their research project, teaching, attending conferences and applying for research grants. PhD Fellows are using their new skills to complete their PhD thesis. It is more difficult to affirm that these skills will be sustained for PhD fellows as it will be more challenging for them to carry on research activities in their countries

straight after their graduation. Nevertheless, preliminary findings from a study[27] undertaken by academics from Massachusetts Institute of Technology (MIT) and Boston University (BU) on behalf of OWSD Secretariat, finds that OWSD PhD alumnae tend to publish more in the six years after the fellowship than applicants who did not receive the fellowship.

In the absence of tracker studies we cannot measure impacts on the career progression of PhD alumnae. However evaluation interview data finds that fellows are confident that the program has/will help progress their careers. Survey data shows that about 70% of EC fellows declared that they were either promoted to a higher position or have been granted higher responsibilities but remain in the same position.

Survey results show that 51% of EC respondents were able to establish new collaborations with academics partners within the framework of the EC grant. About 35% of EC survey respondents declared that they were able to establish collaborations with industrial partners.

4.2 Recommendations

Based on the main findings and conclusions of the evaluation, the following recommendations for the future of OWSD and its two fellowship programmes are made.

Recommendation 1- Raise additional funds for OWSD's activities to ensure the financial sustainability of the OWSD fellowship programmes and, in particular, for the EC fellowship. For this purpose, empower OWSD with stronger decision-making authority.

If SIDA or IDRC stopped funding the fellowship programmes, these could not be sustained. This is a major threat to the continuity of OWSD's activities. Nevertheless, OWSD's status and governing model affects the organisation's decision making power/approval power over various aspects of OWSD operation, including the ability to raise funds independently. Funds from donors go through a "special account" that receives funding for both TWAS and OWSD. The evaluators highlight a conflict of interest with TWAS and the risk that funding for activities aligned with OWSD's mandate is not allocated to OWSD.

For this purpose the evaluation recommends to:

- **Clarify the status and roles of OWSD and TWAS and create distinct, separate special accounts for OWSD and TWAS at UNESCO.**
- **Nominate the "OWSD programme coordinator" as "Director of OWSD" to enhance decision-making and fund raising processes.**
- **Continue joint efforts with UNESCO to identify additional funding for the EC fellowship programme.**

[27] Fry, CV and Furman J., "Migration, Institutional Context, and Global Network Formation: Evidence from female scientists in developing countries", working paper 2021. This ongoing study aims to evaluate data on programmes managed by OWSD for the purpose of understanding the impact of fellowship receipt on (a) rate and direction of recipients' research, (b) the fellowship recipients' scientific networks, (c) the spillover impact of fellowship receipt on host and home institutions. The researchers will publish their findings as academic paper(s). OWSD will use the results of the analyses to refine its fellowship programmes in order to deliver maximum impact with respect to the promotion of women in science and technology and building science capacity in the developing world.

Recommendation 2 - OWSD's contribution to UNESCO's mandate and priorities should be better recognised and rewarded by further support from UNESCO.

OWSD's contribution to UNESCO's targets (capacity building in science, gender equality and priority Africa) is impressive and valued by UNESCO.

OWSD is considered by UNESCO by "one of UNESCO's jewels", a flagship programme for UNESCO's activities supporting Women in Science.

OWSD's belonging to UNESCO has several advantages, particularly for outreach but also has many constraints on the organisation's ability to operate and raise funds independently. OWSD's Secretariat dedicates important time and energy to comply with UNESCO's complex and changing administrative procedures.

UNESCO should be investing more in OWSD in recognition for the organisation's contributions to UNESCO's objectives.

The evaluation recommends that:

- **UNESCO invests more to support OWSD activities, if not financial this could be in-kind contribution.**
- **UNESCO should allow more flexible administrative processes for OWSD to avoid loss of funding opportunities due to the complexity of rules.**
- **UNESCO should better communicate on changing administrative procedures.**

Recommendation 3 – Re-assess country eligibility criteria and enhance the geographical coverage of OWSD's fellowship programmes.

Country eligibility criteria are unclear. OWSD members need to understand why their countries are not eligible. Besides, eligibility criteria do not consider difficulties encountered by women in science that vary from one country to another.

OWSD has lower applications in some eligible countries where it remains a challenge to attract strong candidates. Covering countries with very weak higher education and research systems is a challenge as they offer very few quality applications. However some countries with stronger research systems such as countries in Latin America or Côte d'Ivoire are under represented in OWSD's programmes. Applications from Latin America remain low despite a recent increase in Bolivia.

The evaluation recommends to:

- **Re-assess and clarify country eligibility criteria. Country eligibility criteria should consider specific gender equality indicators (cf. UNESCO SAGA project indicator matrix) and indicators focusing on the performance of the research and innovation systems and the countries level of development.**
- **Raise awareness on OWSD's activities in Latin America and Francophone Africa through enhanced communication in Spanish and French (website, newsletter, short videos/movies).**
- **Explore partnership with British Council to enhance English skills for applications of Latin American fellows. The British Council is exploring partnerships aiming to strengthen English skills of women scientists in Latin America. This is an opportunity to investigate.**
- **Reflect on how OWSD can support eligible countries that have had no awardees during the programme period.**

Recommendation 4 - Enhance the impact of OWSD's fellowship through stronger "storytelling".

OWSD's ability to generate role models for women scientists in STLC is very impactful. For this reason science communication is key. It important to continue strengthening leadership skills of fellows and disseminate visual stories of successful women in Science.

The evaluation recommends to:

- **Involve EC fellows and PhD graduates in telling their stories, why they have chosen a scientific career path, how they set and reached their goals and how they intend to impact societies in their countries.**
- **Identify effective communication channels for disseminating these stories: social media, National Chapters, partnerships with other organisations encouraging girls' uptake of STEM subjects, etc.**
- **Create partnerships with an ICT company.**
- **UNESCO's value added could be on offering training opportunities for OWSD fellows to enhance their leadership and communication skills. UNESCO could also support in the dissemination of OWSD's fellow's stories.**

Recommendation 5 - Enhance the impact of OWSD's fellowship through stronger "mentoring".

To fully achieve its expected objectives, OWSD still needs to establish a mentoring system for and with its members. Interviews conducted within this evaluation pointed out that PhD and EC fellows would welcome stronger mentoring activities to learn from successful members on specific aspects such as establishing relationships with industry or publishing in high impact factor journals.

The evaluation recommends to:

- **Strengthen existing bridges between the EC and the PhD Fellowship programmes and with OWSD members through mentoring.**

Recommendation 6 - Enhance OWSD's international visibility as a key player in gender and science in the Developing World.

The evaluation recommends to:

- **Strengthen cooperation with other gender equality organisations working in STEM, (recommendation 2016 evaluation) for example the Gender Summit, the UN Inter-agency task team in STI for SDGs on Gender and STEM, and UN Women.**
- **Strengthen work in collaboration with UNESCO and in particular with the L'Oreal UNESCO For Women in Science Programme, the UNESCO SAGA project, the UNESCO Science report and the UNESCO gender related Chairs and networks[28].**
- **Play a role for stronger representation of women in national academies of science by encouraging EC fellows to become members of the national academies of science in their countries.**

[28] https://en.unesco.org/gender-related-chairs-and-networks

Recommendation 7 – Make a stronger use of the opportunities offered by OWSD's network of members and OWSD's Chapters.

OWSD has a significant worldwide network of women scientists that can be utilized to further support:

1. OWSD's fellowship programmes
2. OWSD's communication and outreach activities
3. Production of knowledge on Women in Science in STLC

We recommend:

- **OWSD's network is large in terms of disciplines. OWSD members could be further mobilised to bring assistance to the PhDs and EC fellows (selection process, training and mentoring).**
- **Develop a network of high-level women scientists acting as OWSD ambassadors in the scientific circles in which they work and have influence (in research, policymaking or industry, for example).**
- **Sponsor activities of National Chapters that have an impact on OWSD's PhD and EC fellows.**
- **Incrementing the collection and use of data on OWSD's members (yearly survey) to produce gender-based analysis and insights on the role of women in science and the challenges they still face.**

Recommendation 8 - Invest further resources to continue efforts to build a strong MEAL system.

Create a Monitoring & Evaluation role to pursuit progress in setting up a MEAL (monitoring, evaluation, accountability and learning) system. The role would involve:

- **Enhance measurement of impacts through tracer studies and storytelling.**
- **Measure, report and communicate on OWSD's contributions to institutional capacity strengthening.**
- **Improve reporting on quality of publications and influence on science policy, research and industry.**
- **Establish an efficient online instrument compatible with File maker to collect submissions of fellows' progress reports.**
- **Organise learning events where alumnae from recent cohorts can share their experiences with newly awarded fellows with the aim of providing guidance on specific topics and share best practices and lessons learnt e.g., from experience in host institution, setting up a research lab, linking with industry, building capacities in home institution, etc.**

Recommendation 9- Support Institutional transformational change.

Sustainable change requires institutional and systemic transformations. Stronger collaboration with home institutions can enhance the impact and sustainability of OWSD's activities.

Some fellows reported low support from their institutions for their research activities (high teaching load, no time for research activities, administrative issues, gender-based discriminations, etc.).

We recommend supporting the transformation of OWSD's fellows' home organisations through:

- **The development of a gender equality charter applicable to institutions in the Global South. The charter can be inspired by the Athena Swan Charter model[29]. OWSD should consider working with UNESCO and UN Women to develop this framework in consultation with Higher education and research institutions in the Global South.**

Recommendation 10- Embed stronger support to knowledge transfer in the EC programme.

The power and influence that individual researchers have on policy are limited. For this reason, it is important that OWSD finds mechanisms to explore stronger communication between its EC fellows and policymakers.

We recommend to:

- **Explore the possibility of working with knowledge brokers[30] to improve the use of research evidence in policy-making. A knowledge broker organisation can support EC fellows to develop knowledge transfer strategies from the start of their research projects.**

Recommendation 11- Assess the costs and benefits of working with an African partner (AAU, AIMS, etc.)

Having a base in Trieste is important for OWSD to have access to the network of scientific institutions based in Trieste, to TWAS and to ICTP. This ecosystem contributes to an efficient and coherent strategic and operational management of OWSD as it allows sharing of information, best practices and lessons learnt. It is also helpful in mobilising scientists from Trieste based higher education and research institutions for OWSD's selection Committee.

However, partnering with an African organisation might open opportunities for some of OWSD's activities and objectives, such as establishing MoUs for the fellowship programme with strong higher education and research institutions that are part of the ACE Impact network and supporting institutional changes.

We recommend to:

- **Identify and explore possible partner organisations based in Africa and areas of collaboration.**
- **Access the cost of this collaboration versus the value-added for OWSD and its two fellowship programmes.**

Recommendation 12- Raise additional funds to cover the stage in between the PhD and EC fellowships to help PhD graduates continue their research career or ensure strong synergies with TWAS postdoctoral fellowships.

It is difficult to confirm whether capacity strengthening impacts on PhD fellows will be sustainable after completion of the PhD, as it will be challenging for them to carry on research activities in their home countries. They are at an early stage of their career and might lack a solid track record in research to attract funding for research activities. Without

[29] https://www.advance-he.ac.uk/equality-charters/athena-swan-charter

[30] "Knowledge brokering links decision makers and researchers, facilitating their interaction so that they are able to better understand each other's goals and professional cultures, influence each other's work, forge new partnerships, and promote the use of research-based evidence in decision-making." Lomas J. The in-between world of knowledge brokering. Br Med J. 2007;334:129–32.

support, some of them risk being tied up in teaching activities or seeing better career prospects in other sectors or abroad

We recommend to:

- **Create strong synergies between the OWSD PhD programme and the IsDB-TWAS Post doctoral PhD for women in Science. For example a priority could be given to OWSD PhD graduates in the TWAS selection process**
- **Develop mentorship opportunities for PhD fellows with EC fellows or other experienced OWSD members to inform them about existing opportunities for young researchers in their field of research**
- **Explore funding opportunities to establish an OWSD postdoctoral fellowship complementary to the scope of the IsDB-TWAS Postdoctoral Fellowship Programme for Women**

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