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OWSD



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LETTER FROM THE OWSD PRESIDENT



I am delighted to write this letter for the second OWSD Annual Report. Like last year's this one is not only informative and comprehensive, but also beautiful to behold. It covers just some of the incredible achievements and successes of our members and fellows from all around the world.

2019 marked a major year for our membership, which grew by more than a quarter in a single 12-month period. We are also extremely proud of our 28 National Chapters—including the 11 new ones!—who, without any direct financial support from us, continue to do amazing work. Read all about them in this report.

Among the highlights of my year as President were the opportunities I was given to represent and talk about this amazing organization called OWSD! These included speaking at the Association of African Universities in Nairobi in March which allowed me to introduce us to many African scientists who, amazingly,

had not heard of OWSD. Later in the year I was asked to address the women scientists attending the African Biennial Biosciences Communication Symposium in Pretoria, which emphasized agricultural biotechnology, my field of research. It gave these women an opportunity to share with each other the ups and downs of being a scientist in Africa.

It was my singular privilege to attend the Early Career Fellows workshop in Trieste in September. What an exceptional group of women scientists who are doing the most exciting research all over the world. It was a great experience to interact with them, to hear their stories and to share with them some of my own knowledge of how to get ahead in their field.

To all of you who are reading this letter, know that I am so proud to be a part of your journeys and wish you all the best in your future endeavours.


Jennifer Thomson
OWSD President



Early Career Fellows Mavis Owureku-Asare and Salifou Chakirath Folakè Arikè at the November 2019 orientation workshop in Trieste, Italy

OWSD IN 2019: AN OVERVIEW

As we approach the end of the second decade of the new millennium, we cannot avoid the fact that huge changes are taking place in the world. Climate change has made 'science' a public word and mass migration caused by natural disasters and conflict have also ensured that developing countries are at the forefront of international news. Added to this, there has been a growing awareness of the needs and rights of girls and women and their equal and just treatment in the workplace, initiated by the highly visible "#metoo" movement. What all this means for OWSD is that women, science and development are key topics on many academic and policymaking agendas. Added to this, women throughout the developing world are becoming aware that they can make a real difference to the societies they live in and are seeking career opportunities—and access to power—so they can influence and change their surroundings. It is in this context and environment that OWSD has seen burgeoning activities in the last two years, and we have been able to expand and improve the opportunities we provide for women scientists from the developing world to pursue their studies and research in science to an advanced level.

After a big year for OWSD membership in 2018, with the launch of 7 National Chapters and activities organized in all four OWSD regions, this momentum is gathering pace – in 2019, 11 more National Chapters have been established and their executive committees have organized more than 51 major activities in the regions. Our membership has reached 9000*! And signs are that the pace will continue into 2020 with 13 countries expressing an interest in establishing National Chapters. Our reach in Latin America and the Caribbean (LAC), which has historically had the lowest participation of members and fellows, is steadily increasing. This year sees our first Early Career Fellows from the LAC region (Bolivia and Guatemala), and our first ever PhD fellow from the LAC region (Bolivia). Our membership in the region is also increasing, with National Chapters established in Uruguay and Peru.

The Early Career fellowship programme, now in its second year, has successfully recruited a further 20 fellows and held two training workshops: the orientation workshop for the new 2019 fellows, in Trieste; and the regional workshop for the 2018 Fellows in Dar-es-Salaam, hosted by the Tanzania National Chapter. In their second year, we see the Early Career Fellows are submitting patent applications, connecting with industry and securing external grants beyond their current fellowships.

In our PhD fellowship programmes we celebrated 22 new graduates (following a record-breaking 32 in 2018), for a total number of 281 alumnae. In addition, the links between the PhD Fellows and National Chapter members are strengthening and of mutual benefit, with the OWSD Malaysia National Chapter hosting a highly successful workshop for OWSD Fellows in the region.

The winners of the OWSD-Elsevier Foundation also continue to make a big impact both internationally and in their home countries, benefitting from extensive media coverage, including dozens of interviews and articles in national and international media outlets.

One year after its 25th anniversary, OWSD is now in a stronger position than ever to support women in science from developing countries, with over three decades of experience working to develop and expand networks, opportunities and resources. OWSD is immensely proud to be contributing to improving the lives, well-being and futures of communities in the world's most disadvantaged countries.

*Membership numbers will be revised in 2020 to reflect active members only.

“

I celebrate OWSD because of what it stands for: women's empowerment.



Catherine Koofhethile
2010 OWSD Fellow, Botswana



OWSD Early Career Fellows at the September 2019 orientation workshop in Trieste, Italy.

OWSD PHD FELLOWSHIPS

The [PhD fellowship programme](#) has been OWSD's flagship programme since 1998, when the first fellowships were awarded. This South-to-South fellowship is designed to promote mobility, enabling women from scientifically- and technologically-lagging countries (STLCs) to undertake PhD research at host institutions in another developing country. Fellows have the option of completing either a full-time fellowship or a 'sandwich' fellowship, which provides for shorter-term research visits. The fellowship covers full funding for the PhD fellows' monthly stipends when on site, return travel, visa and health insurance costs. Tuition and registration fees are negotiated with the host institute. All funding for the PhD fellowship programme is provided by the Swedish International Development Cooperation Agency (Sida).

In 2019, 27 new PhD fellowships were awarded, bringing the total number of OWSD PhD fellows since the start of the programme to 498; of these, 176 were active (in the process of completing their fellowship) in 2019. Twenty-two fellows graduated with their PhDs, making 281 graduates in total.

PhD APPLICATIONS

The 2019 Call for Applications for the OWSD PhD Fellowships opened on 1 March, and closed on 30 May. A total of 162 eligible applications were received. Consistent with trends over the last several years, there was a rise in the number of applications that were recommended for funding by the fellowship selection committee, making the fellowship increasingly competitive.

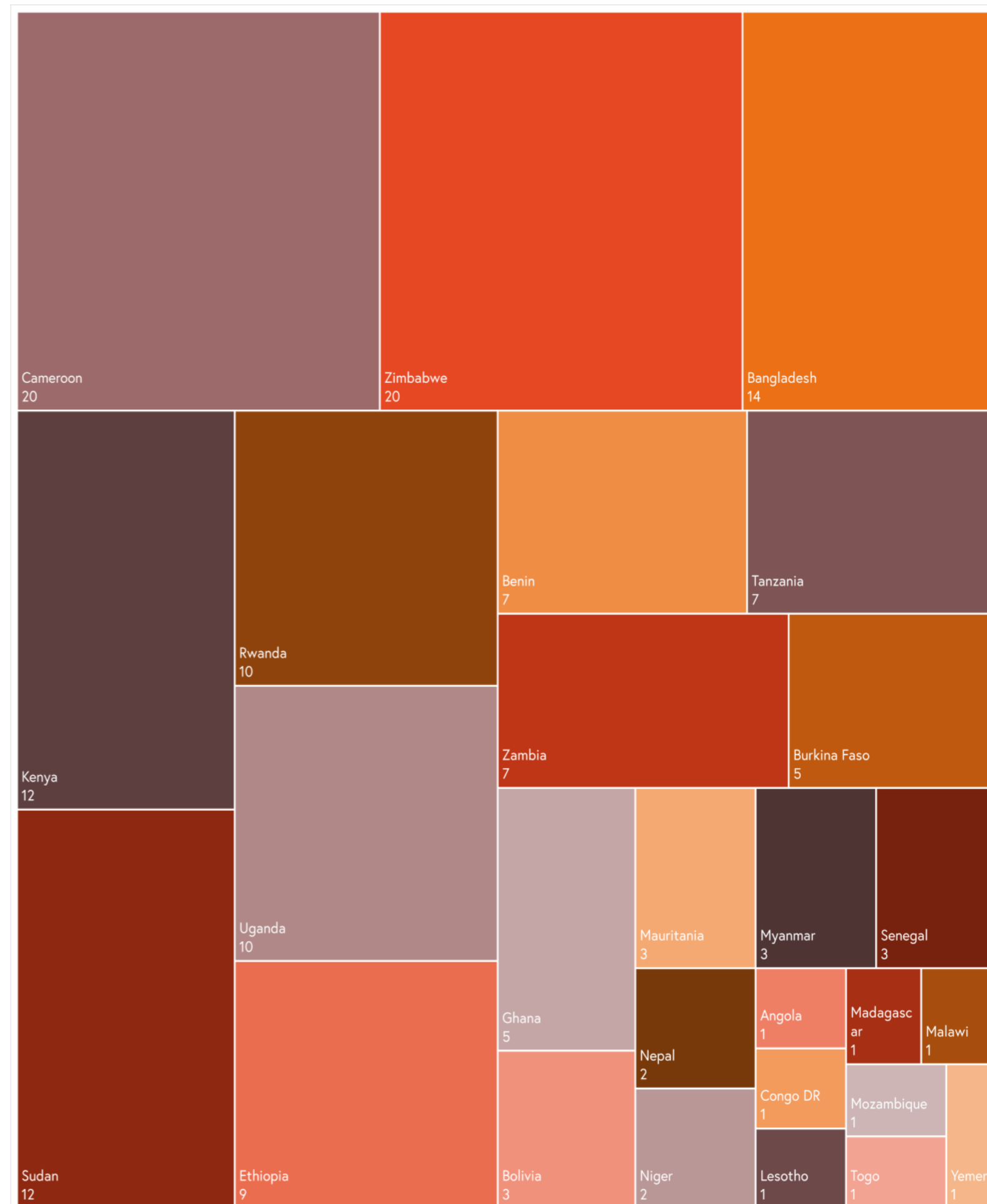
Where from? Applications were received from 27 countries; 70% of these applications came from 22 Least Developed Countries (LDCs). As in 2018, Cameroon remained the country with the highest number of applicants, this year tying with Zimbabwe with 20 applicants. Applications from Bangladesh doubled from 2018, making it the country with the third highest number of applicants. Kenya and Sudan also continue to be sources of high numbers of ap-

plicants, with 12 applications each.

Where to? South Africa remained the most popular destination host country for applicants by a wide margin, selected by 44% of applicants; China followed at 10% and Malaysia at 9%. There was significantly greater diversity in the range of host countries selected compared to previous years, however, with 29 host countries identified overall compared to 20 in 2018 and 19 in 2017.

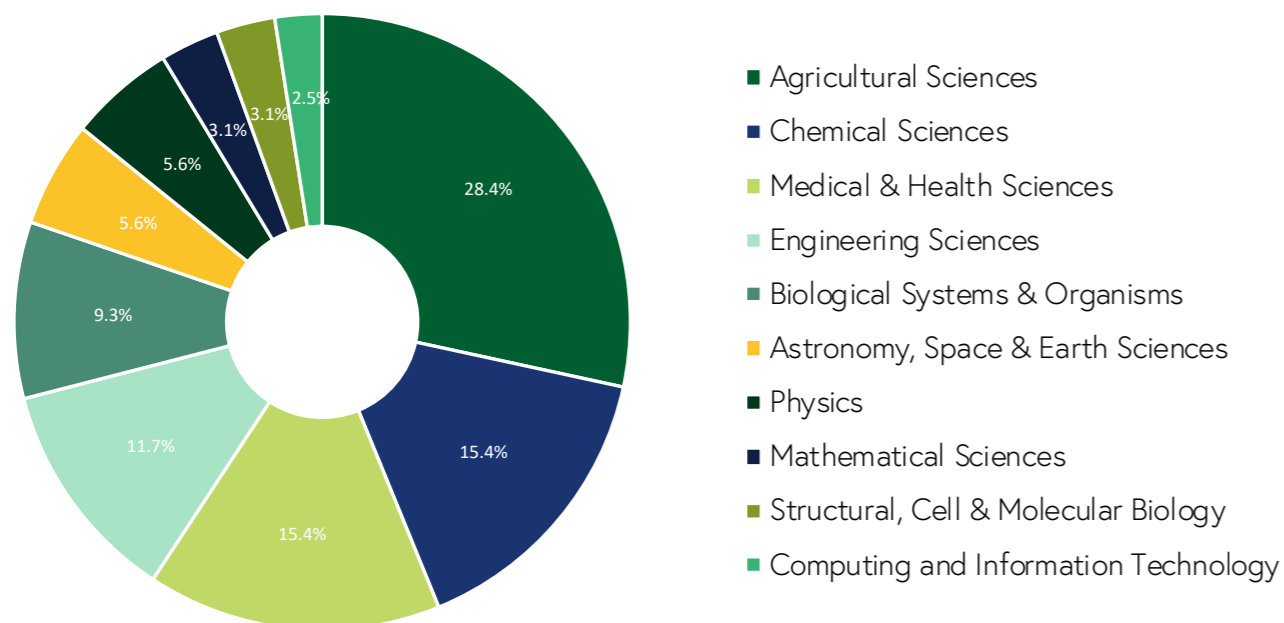
Which STEM subjects? Agricultural sciences remained the most popular discipline for applicants, with 28% of applicants (down from 39% in 2018 and 40% in 2017). Chemical sciences and medical & health sciences came next (15% each), followed by engineering sciences (11%). Engineering applicants

2019 PhD Fellowship applications by country

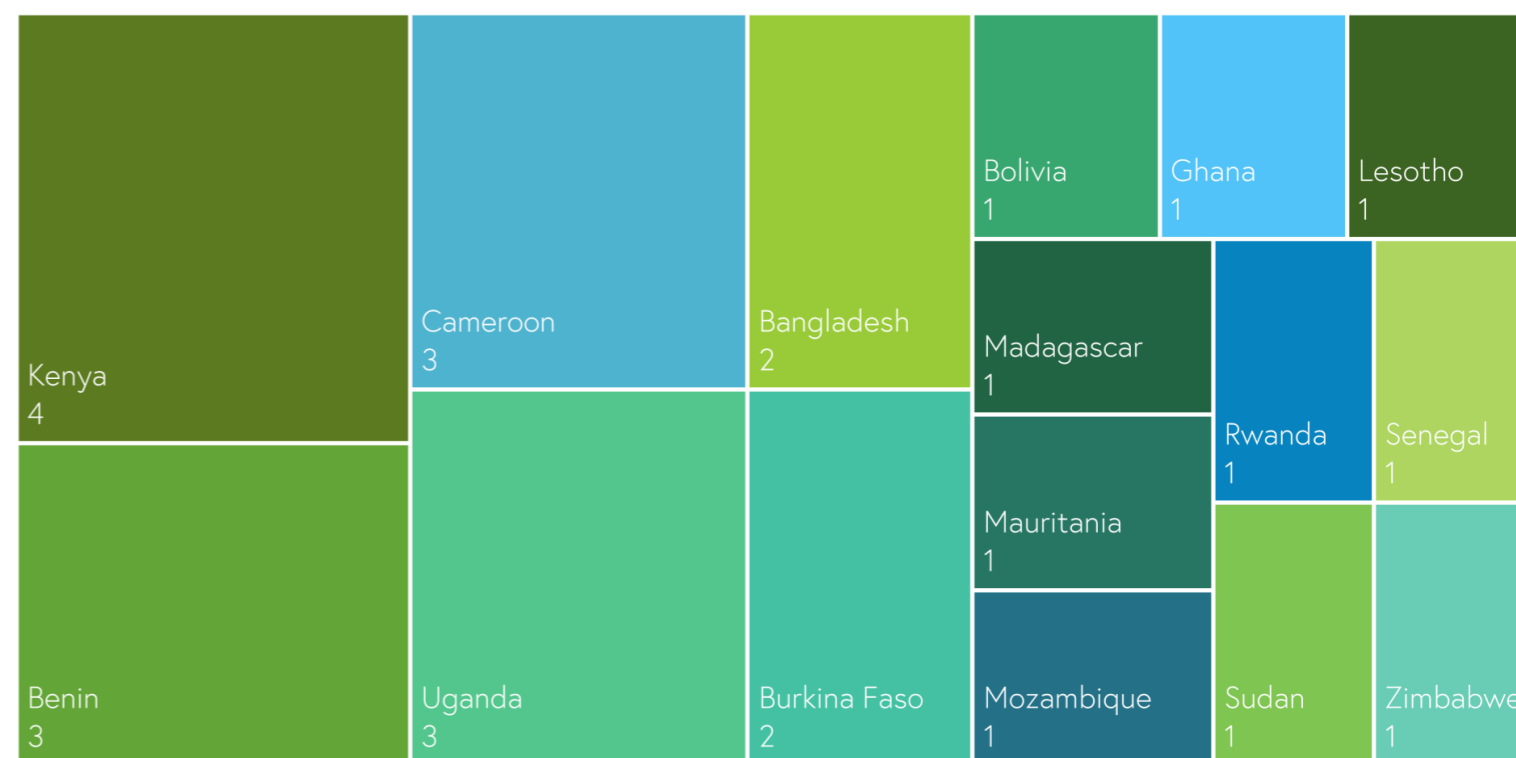


increased significantly, from only 3% of applicants in 2018 to 11% in 2019. While still making up a small share of the total, the number of applicants in computing and information technology—a field where women are particularly underrepresented—also increased from only one in 2018 (less than 1% of applicants) to four in 2019 (2%). The number and share of applicants in mathematics and physics decreased slightly, however, with only 3% and 6% of applicants, respectively, compared to 6% and 9% in 2018.

2019 PhD Fellowship applications by discipline



2019 PhD Fellowship awards by country



In 2019...

27 fellowships awarded

17 fellows from LDCs

15 full-time fellowships

12 sandwich fellowships

PhD AWARDS

There were 27 fellowships awarded in 2019; 15 full-time, and 12 sandwich. The 2019 fellows include the first awardee from Latin America and the Caribbean in the 21-year history of the PhD fellowship programme.

Where from? The awardees came from 16 countries: Bangladesh (2); Benin (3); Bolivia; Burkina Faso (2); Cameroon (3); Ghana; Kenya (4); Lesotho; Madagascar; Mauritania; Mozambique; Rwanda; Senegal; Sudan; Uganda (3); and Zimbabwe. Seventeen, or 63%, of the awardees came from Least Developed Countries. Paola Rocabado Koya from Bolivia became OWSD's first PhD fellow from the Latin America and Caribbean region, where six countries became eligible following a revision to OWSD's eligible countries list in 2017 (previously, only Haiti was eligible in the region).

Caribbean region, where six countries became eligible following a revision to OWSD's eligible countries list in 2017 (previously, only Haiti was eligible in the region).

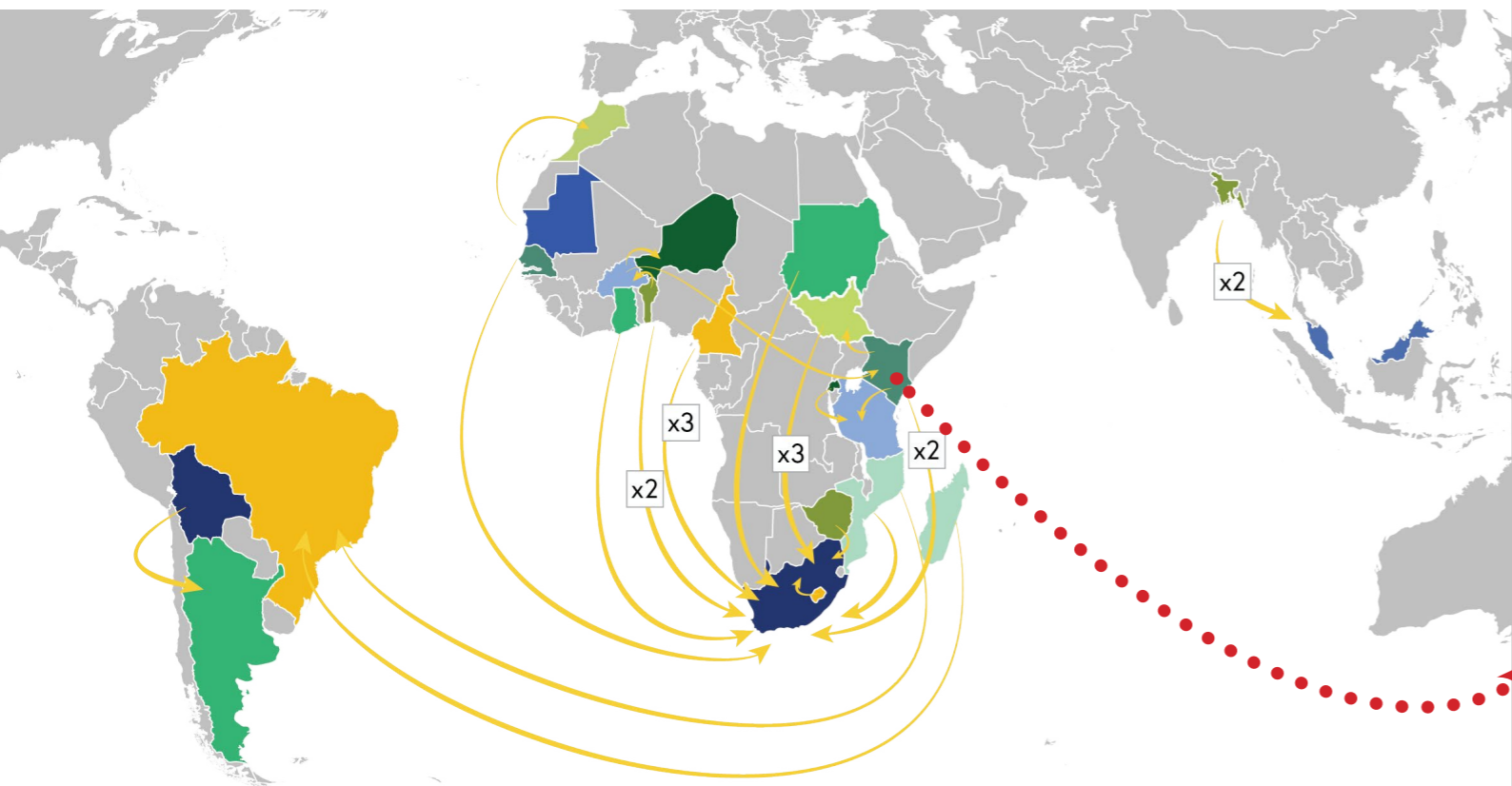
Where to? Over half of the awarded fellows (15 of 27) will complete their PhD fellowships in South Africa. Two fellows each will pursue their PhDs in Brazil and Kenya, and one each in Argentina, Burkina Faso, Malaysia, Morocco, Niger, Tanzania and Uganda. This is the first time that Niger has been selected as a host country in 21 years of the fellowship programme, and the second for Argentina.



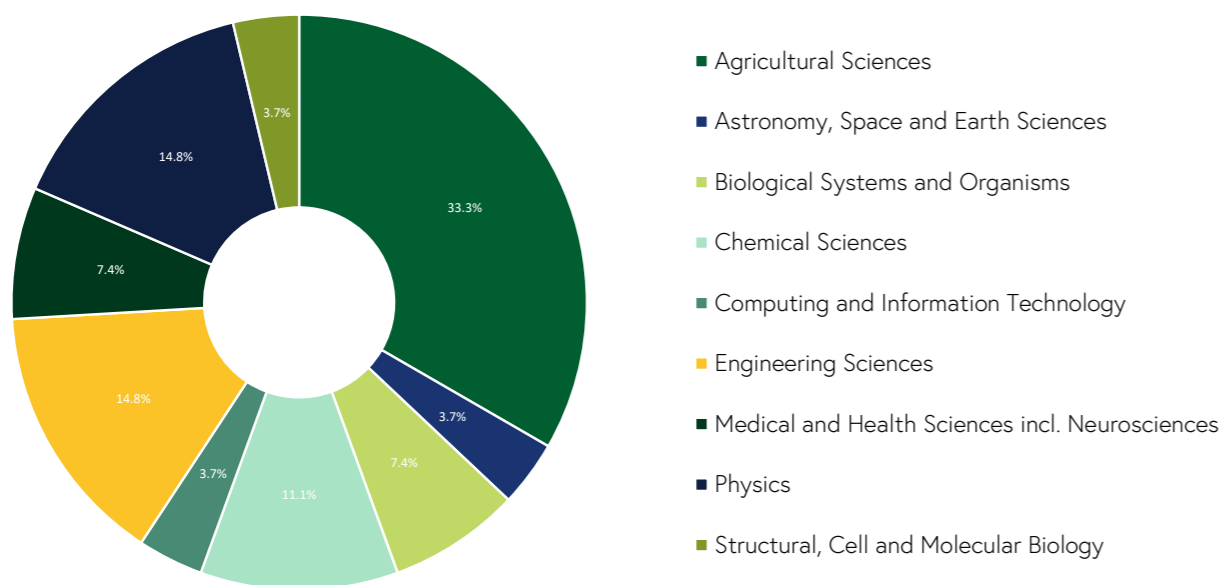
2019 PhD Fellow
Paola Rocabado Koya
from Bolivia

In which STEM subjects? While agricultural sciences continued to be the most popular discipline for applicants, with a third of the fellowships (9 of 27) awarded in this discipline, a large number of fellowships were also given in physics (4), engineering (4), and chemistry (3). Fellowships were also given in the fields of biological systems & organisms (2), medical & health sciences (2), and in: astronomy, space & earth sciences; computing & information technology; and molecular, structural & cell biology (1 each).

2019 PhD Fellowship awardees: home and host countries



2019 PhD Fellowship awards by discipline



FAITH TOO
2019 PHD FELLOW, KENYA

Awarded a full-time fellowship to pursue a PhD in computing & information technology at University of the Witwatersrand in South Africa, Faith's research focuses on using machine learning to improve personalisation in educational technology. The technologies she is developing will help to identify students' learning and testing speeds and their understanding of various concepts and prerequisite knowledge, informing real-time recommendations to help the students learn better.

CONTINUING PhD FELLOWS

In 2019, OWSD supported 176 active PhD fellows, including those newly awarded; 111 of the fellows are full-time, and 65 are studying under the sandwich scheme.

Active fellows have the opportunity to travel to conferences, workshops or other trainings using an international travel grant available to each fellow. The grant has enabled fellows to attend important international conferences, including a Keystone Symposia Series proteomics conference (Sweden), the Pangborn Sensory Science Symposium (Scotland), and the Canadian Agricultural Economics Society Annual Meeting. Other fellows have used their travel grants to attend trainings such as a practical engineering certification for Toyota cars and a workshop on water resources in developing countries.

In 2019...

34 fellows attended **38** conferences with travel grant funds.

37 fellows published papers in an international journal.

31 fellows collaborated with scientists outside of their institutes.

AFRAH KHAIRALLAH
2015 PHD FELLOW, SUDAN

In July 2019, Afrah traveled to Basel, Switzerland for the 27th Conference on Intelligent Systems for Molecular Biology and 18th European Conference on Computational Biology, where she presented a paper on a potential enzyme to be used as an anti-malarial drug target. At the conference, she had the opportunity to network closely with international experts in her field.

“ *This event contributed to my career development by enabling me to create new professional connections, receive feedback, and learn from experienced researchers.* **”**



PhD REGIONAL WORKSHOP

Kuala Lumpur, Malaysia | 20-24 August, 2019



As part of the PhD fellowship programme, OWSD organizes regular workshops for fellows to improve their scientific career and leadership skills. The PhD workshops are organized on a rotating basis in one of the four OWSD regions (Africa, the Arab region, Asia-Pacific, and Latin America and the Caribbean). In recent years, OWSD National Chapters have taken on the role of organizing the workshops. In 2019, the OWSD Malaysia National Chapter invited 24 OWSD PhD fellows studying in the Asia-Pacific region to attend a workshop in Kuala Lumpur, as well as to participate in an Education Symposium and Women in Science Forum. Fellows were also invited to attend the re-launch of the National Chapter. In addition to the PhD fellows, two OWSD Early Career fellows from Nepal and Sri Lanka were invited to facilitate and lead some sessions at the workshop.

The workshop was held from 20-24 August at the Berjaya Times Square Hotel. Of the 24 fellows who participated, 17 were completing their fellowships at universities in Malaysia. Four fellows travelled from China, one from India, one from South Africa, and one from Thailand. The participating fellows came originally from 11 countries: Bangladesh; Cameroon; Madagascar; Myanmar; Nepal; Nigeria; Rwanda; Sudan; Syria; Yemen; and Zimbabwe.

The workshop kicked off with a session on developing confident oral presentation skills, led by OWSD Coordinator Tonya Blowers. A special half-day session on improving academic writing — both for publication and for the doctoral thesis — followed, facilitated by Ravi Murugesan of [AuthorAID](#). Additional

subjects covered over the three days included writing successful research grant proposals, establishing research collaborations, and working with PhD supervisors. At the end of the workshop, fellows were challenged to reflect on their career trajectories to date and to look ahead towards identifying future career goals. They were assisted in this by Early Career Fellows Nimanthi Jayathilaka and Shobha Poudel, who shared their experiences and advice for life after the PhD with the fellows.

“
I came away knowing that it's good to have challenges, that they will make you stronger and wiser.
”
- BATOUL YOUSIF HASSAN
2016 PhD Fellow, Sudan



“
The sessions were loaded with so much information. I am going back fully re-charged to do my work with commitment and diligence, and hope to serve as a source of motivation for someone else to succeed.
”
- MAUREEN CHIJOKE-OKERE
2016 PhD Fellow, Nigeria





2019 PhD Fellowship graduate
Ruth Nahurira from Uganda

PHD GRADUATES

In 2019, 22 women graduated from the OWSD fellowship programme with their PhDs, making a total of 281 graduates from the programme since 1998.

Where from? OWSD PhD graduates originate from 34 countries across Africa and Asia: Nigeria (62); Bangladesh (28); Sudan (28); Cameroon (26); Myanmar (19); Kenya (17); Uganda (13); Zimbabwe (12); Ethiopia (10); Ghana (8); Tanzania (8); Benin (7); Yemen (5); Malawi (4); Zambia (4); Lesotho (3); Nepal (3); Botswana (2); the Democratic Republic of Congo (2); the Republic of Congo (2); eSwatini, Kingdom of (2); Madagascar (2); Rwanda (2); Senegal (2). Countries with a single graduate are Angola, Burkina Faso, Gabon, Mauritania, Mauritius, Mozambique, Namibia, Sierra Leone, South Africa and Togo.

In which STEM subjects? The largest percentage of OWSD PhD graduates received their PhDs in structural, cell and molecular biology (21%) and agricultural sciences (20%). Chemical sciences as well as biological systems & organisms each account for 15% of graduates, while the medical and health sciences (including neuroscience) account for 10%. Smaller numbers of fellows graduated in physics (8%), mathematical sciences (7%), engineering sciences (1%), and astronomy, space and earth sciences (1%).

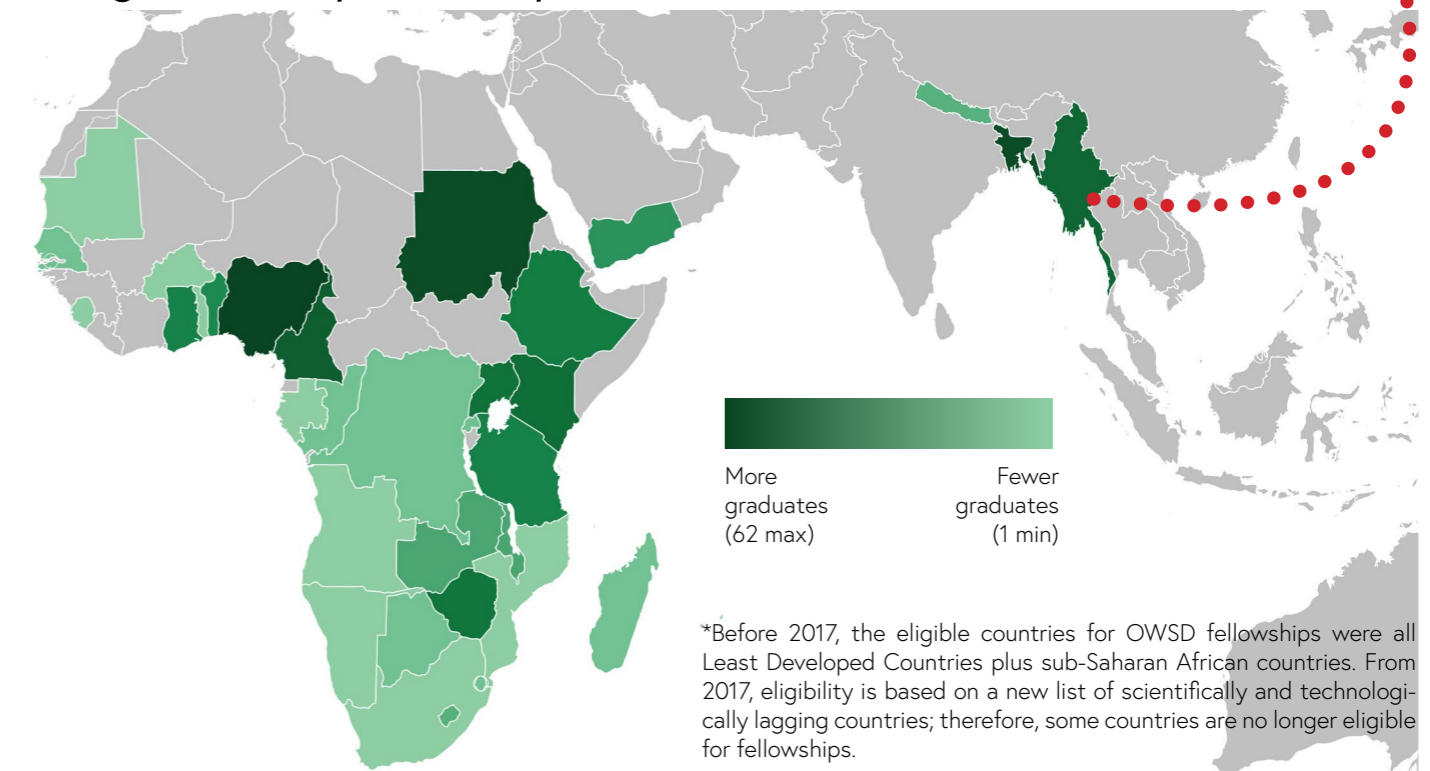


LAI LAI

2014 PHD FELLOW, MYANMAR

Awarded a PhD in Agronomy by the Institute of Tropical Agriculture and Food Security, Universiti Putra Malaysia. Her PhD thesis focused on the utilization of rice straw biochar and urea to mitigate the emission of greenhouse gases in sustainable rice production. Dr. Lai will now distribute the technology developed through her research to extension staff and farmers in Myanmar, through her work at the Ministry of Agriculture, Livestock and Irrigation.

PhD graduates by nationality, all-time



2019 PhD GRADUATES

Name	Nationality	Fell. Year	PhD Awarded From	Title of PhD Thesis
Jade Abuga	Kenya	2014	University of Cape Town, South Africa	Effect of thermal radiation magnetohydrodynamic fluid flow past a vertical semi-infinite plate in the presence of chemical radiation
Oluwaseun Adeola Adewara	Nigeria	2013	University Of Ibadan, Nigeria	Stress responses of lactic acid bacteria and yeasts isolated from sorghum gruel and retted cassava and their application in food fermentation
Nneka Augustina Akwu	Nigeria	2013	University of Kwazulu-Natal, South Africa	Pharmacognosy and morphology of the Leaves, and Stembark of <i>Grewia lasiocarpa E.Mey. ex Harv.</i>
Manalebish Debalike Asfaw	Ethiopia	2014	Addis Ababa University, Ethiopia	Mathematical analysis of plant-herbivore interaction in the Ethiopian climate
Gnido Amandine Assogba	Benin	2015	University of Abomey-Calavi, Benin	Impacts of climate change on geographical distribution of <i>bombax costatum</i> in Benin, West Africa
Winifred Ayinpogbilla Atiah	Ghana	2016	Kwame Nkrumah University of Science and Technology, Ghana	Diagnosis of precipitation drivers over South Western Africa
Sylvie Diane Djiomba Njankou	Cameroon	2012	Stellenbosch University, South Africa	Mathematical models of Ebola virus disease with socio-economic dynamics
Violet Patricia Dudu	Zimbabwe	2016	North West University, South Africa	Radionuclide particulate distribution in uranium mine tailings in the Witwatersrand mining area of South Africa
Lai Lai	Myanmar	2014	Universiti Putra Malaysia, Malaysia	Utilization of rice straw biochar and urea to mitigate greenhouse gases emission in sustainable rice production
Nancy Unjemo Madigu	Kenya	2011	University of Botswana, Botswana	Efficacy and toxicity profiles of selected plants used in traditional medicine for management of anaemia
Esther Agatha Marijani	Tanzania	2012	The Open University of Tanzania, Tanzania	Occurrence of mycotoxins in <i>Oreochromis niloticus</i> feeds and their effects on reproductive and growth performance
Theresa Bonifasi Mkenda	Tanzania	2013	Catholic University of Eastern Africa, Kenya	Statistical methods for estimating the age at HIV infection retroactively in poor resource settings
Edith Pascale Mofo Mato	Cameroon	2014	University of Kwazulu-Natal, South Africa	Role of natriuretic peptides in the management of metabolic and cardiovascular diseases complications in African population groups
Nusiba Mohammed Modawe Alshik Edris	Sudan	2013	Universiti Putri Malaysia, Malaysia	Simultaneous determination of organic analytes by reduced graphene oxide-azo dyes/gold nanoparticles modified glassy carbon electrode
Phetogo Ineeleng Monau	Botswana	2014	University of Pretoria, South Africa	Phenotypic and genetic characterisation of indigenous Tswana goat in Botswana
Ruth Nahurira	Uganda	2012	Graduate School of the Chinese Academy of Agricultural Sciences, China	Molecular Mechanisms of Phthalic Acid Esters (PAEs) Degradation by <i>Gordonia alkanivorans</i> Strain YC-RL2
Ndeye Maty Ndiaye	Senegal	2015	University of Pretoria, South Africa	Vanadium Oxides Based Composites for Energy Storage Application
Marie Ide Ngaha Njila	Cameroon	2013	University of Douala, Cameroon	Effects of methanolic extract from leaves of <i>Alchordia Cordifolia</i> (Euphorbiaceae) on fertility and sexual behavior in senescent rats
Marie-Mediatrice Ntabugi Kikongo	Congo, Dem. Republic	2012	University of the Philippines, Los Banos, the Philippines	Multiple-drug resistance and heavy metal tolerance in <i>Salmonella</i> spp. isolated from the San Cristobal River, Calamba, and health risks of communitites residing along the riverbank
Adetola Olugbile	Nigeria	2013	Federal University of Agriculture, Abeokuta, Nigeria	Microbiological, nutritional and sensory properties of Finger and fonio millet sourdough bread
Carole Stephanie Sake Ngane	Cameroon	2013	University of Yaounde 1	Phenotypic and functional characterization of Natural killer cells in antiretroviral naive HIV-1 infected people
Nkechinyere Judith Uwazie	Nigeria	2016	University of Ilorin, Nigeria	<i>Senna Alata</i> flower: Isolation, characterization and toxicological assessment of anti-diabetic principle(s) in streptozotocin-induced diabetic male rats

Meet the 22 new scientists who received their PhDs in 2019.



SPOTLIGHT ON: KAUSILA TIMSINA



Kausila Timsina had already been accepted into a PhD programme at Sikkim University in India when she came across the OWSD PhD fellowship on a mailing list for funding opportunities. The fellowship "seemed just right for me", she said, and so she applied—and was awarded a full-time fellowship in 2015. A native of Bhutan, she is interested in how climate change and hydropower development in the Eastern Himalayan region affect both people and the environment.

While hydropower is seen as a green alternative to other sources of energy production, hydropower development projects affect available water and land resources, and the people whose livelihoods depend on them, in complex ways. In the Teesta River basin where Kausila's research is focused, climate change and extreme weather events have contributed to changes in the river's flow that impact large numbers of people; but hydropower development is the subject of heated debate, as people with differing social, religious and environmental concerns contest over whether it is the cause of the drying up of

drinking water sources, or of catastrophic weather events such as flash floods in Bhutan and Nepal and cloud bursts in Sikkim.

Kausila's research uses Geographic Information System (GIS) and remote sensing techniques to forecast changes in water flow on the Teesta River due to climate change, and to analyse the impact of these changes on the potential energy that can be produced from hydropower. Her findings will inform the development of future hydropower projects that will reduce the negative impacts on land productivity and on social and cultural practices.

"It has become clear to me how important sustainable hydropower development is in order to maintain social stability, water quality and income generation for the state," she says.

"The OWSD fellowship has not only made me financially able to



do my PhD research, but also gave me opportunities to make connections worldwide, to learn from the experts in my subject, and to present my research findings at the world's best conferences, such as the 2018 IEEE eScience conference. It has also helped me to get various training and networking opportunities."

After receiving her PhD, Kausila plans to work as part of a research organization in order to gain more knowledge and skills about water resources, and eventually to open an institute on water resources in Bhutan. She also hopes to establish an OWSD National Chapter in Bhutan so that other Bhutanese women can benefit from opportunities for scientific education and research.



OWSD EARLY CAREER FELLOWSHIPS

The [OWSD Early Career fellowship programme](#) launched in 2018 with the objective of supporting women scientists in the developing world to lead world-caliber research projects in their home countries. The fellowship is offered to women who are within 10 years of their PhD in STEM subjects and who are employed in academic or scientific research institutes in one of the 61 eligible countries. Fellows receive a grant of up to USD 50,000 as well as training in leadership, management, communications and outreach skills. The grant funding is as flexible as possible in order to support fellows to establish environments at their institutions where they can maintain an international standard of research and attract scholars from all over the world to collaborate; eligible expenses include childcare assistance and hosting visiting scholars, in addition to equipment and consumables, research assistance, fieldwork expenses, and information resources. An important aspect of the Early Career fellowship programme is innovation and the potential to generate impact on a broader scale; fellows are selected partly on the strength of their proposals to connect with public and private sector partners and convert their research into marketable products. The Early Career programme is funded entirely by IDRC, the Canadian International Development Research Centre.

In the second year of the fellowship programme, 20 fellowships were awarded to women scientists from 15 countries across Africa, the Asia-Pacific, and Latin America and the Caribbean. The new fellows joined the 19 women awarded in 2018 in the first cohort.

EARLY CAREER APPLICATIONS

The application period for the 2019 Early Career fellowships was open from March 1 to May 2. A total of 162 eligible applications were received; 22 applications were highly recommended by the OWSD selection committee.

Where from? Applicants came from 29 countries in all four OWSD regions: Africa; the Arab region; Asia-Pacific; and Latin America and the Caribbean. Kenya remained for the second year the country with the highest number of applicants (23). Other countries with high numbers of applications were Ghana (16), Bangladesh (13), Cameroon (12), and Tanzania (11). Just over half of all applicants—53%—were from Least Developed Countries. The share of appli-

In 2019...

- 162** eligible applications
- 22** applicants highly recommended
- 53%** of applications from least developed countries

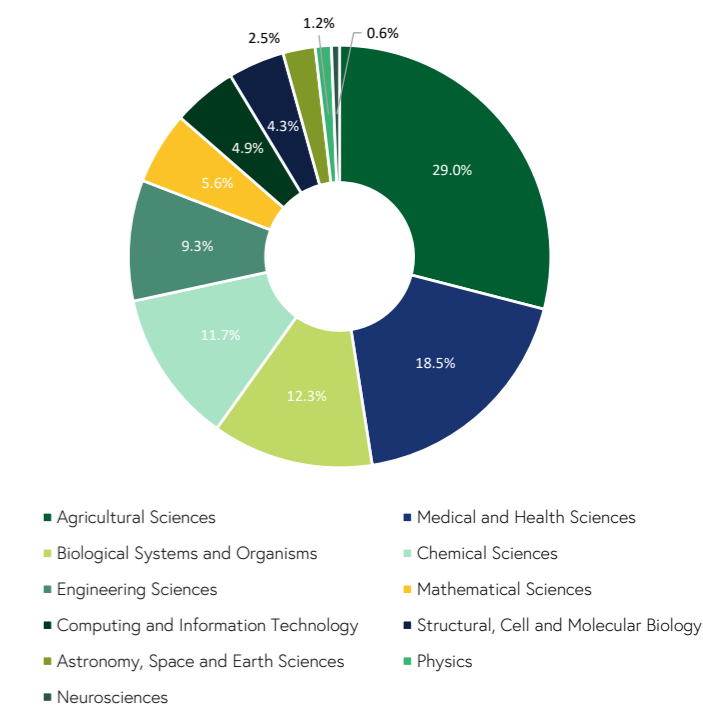
2019 Early Career applications by country



cations from the Arab region and from Latin America and the Caribbean increased slightly over 2018 (from 1%-4% and from 2%-3%, respectively), while the share of applicants from Asia-Pacific dropped from 26% to 21%; the large majority of applications remained from Africa.

In which STEM subjects? Close to a third of applications (29%) were in the field of agricultural sciences for the second year. Medical and health sciences was the second most popular field, with 19% of applications, followed by biological systems and organisms (12%), chemical sciences (11%), and engineering sciences (9%). Though still very low, the share of applications in the fields of mathematics and computing and information technology, where women are historically dramatically underrepresented, did improve a small amount; maths rose from 4%-6% of applications, and computing and information technology from 4%-5%.

2019 Early Career Fellowship applications by discipline



In 2019...

20 fellowships awarded

11 fellows from LDCs

EARLY CAREER AWARDS

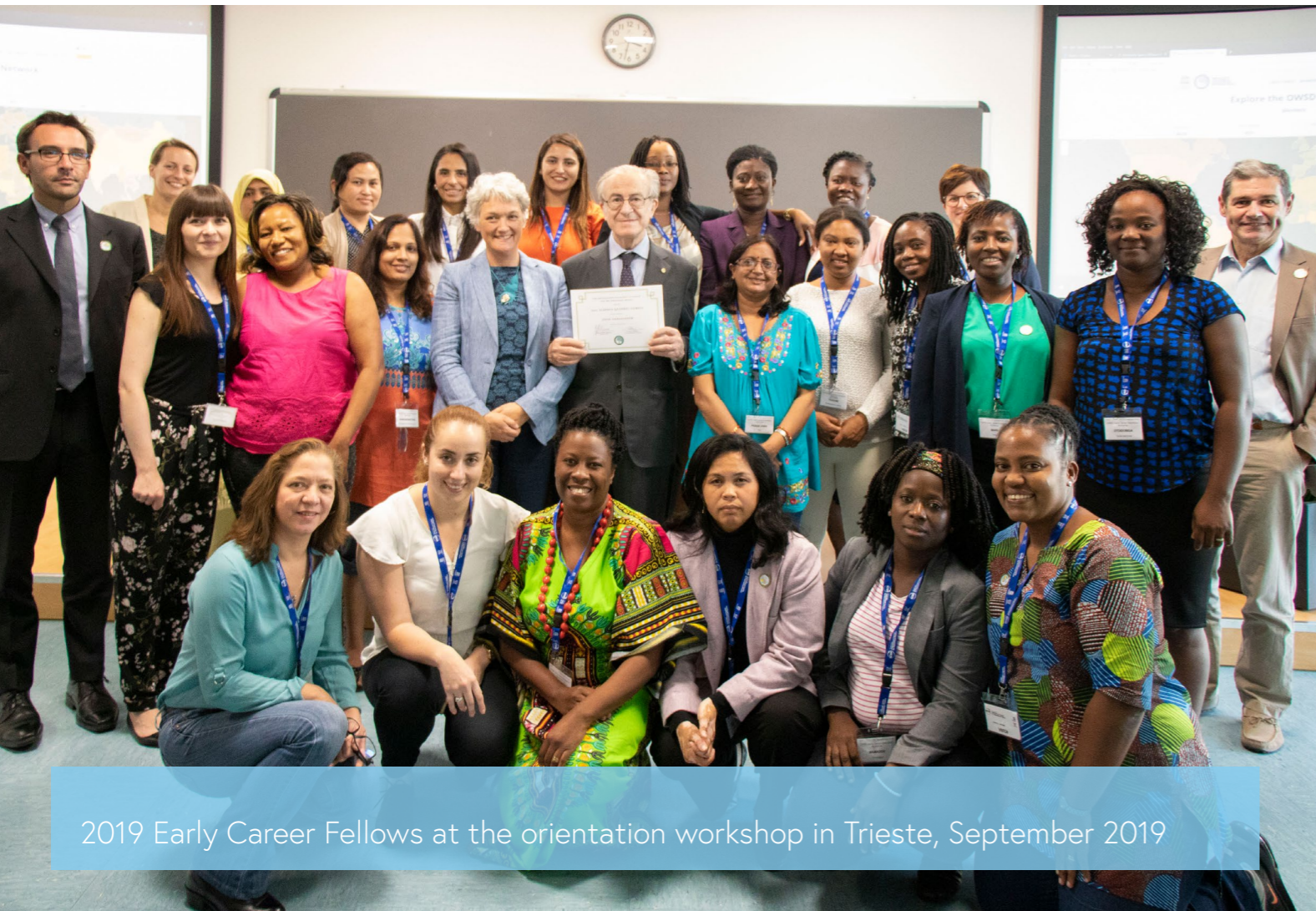
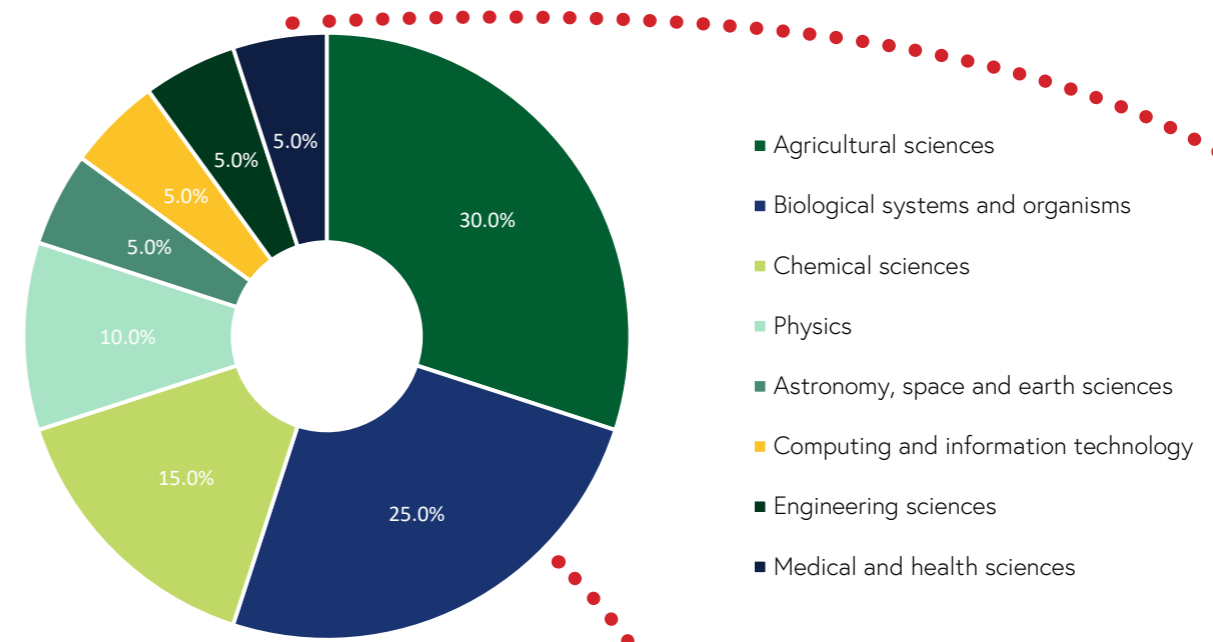
Twenty women were awarded Early Career fellowships in 2019. Meet them and read about their individual research projects on pages 25-26.

Where from? The 2019 Fellows come from 15 countries across the developing world. Around two-thirds are from Africa: four from Ghana; two from Benin; and one each from Burkina Faso, Ethiopia, Kenya, Madagascar, Tanzania, and Uganda. Another quarter are from the Asia-Pacific region, with two fellows from Nepal and one each from Bangladesh, Lao PDR, and Sri Lanka. Finally, the 2019

cohort included fellows from Latin America & the Caribbean for the first time, with two fellows from Guatemala and one from Bolivia.

In which STEM subjects? Six of the twenty scientists awarded fellowships are working in the agricultural sciences. Five scientists' research projects are in biological systems & organisms (an increase over the first cohort in 2018 when only one project was awarded in this field). Three fellows' research projects are in chemical sciences, two in physics, and one each in astronomy, space & earth sciences, computing & information technology, engineering sciences, and medical & health sciences.

2019 Early Career fellowships by discipline



2019 Early Career Fellows at the orientation workshop in Trieste, September 2019



NATALIA MONTELLANO-DURAN
2019 EARLY CAREER FELLOW, BOLIVIA

Dr. Montellano-Duran's research focuses on identifying bioactive molecules in tropical fruits in order to understand their capabilities as functional foods (foods that produce a specific physiological response in the body). She studies and catalogs the nutrient content of the fruits, as well as their physical characteristics and biological activities. By providing a better understanding of these fruits as foods with nutritional benefits and bioactive compounds, she hopes to reduce the incidence of common diseases in the region and help indigenous Bolivian fruit farmers to be able to better market their products.



PRISCILLA MANTE
2019 EARLY CAREER FELLOW, GHANA

Dr. Mante is identifying microRNA biomarkers of epilepsy in Ghanaian epilepsy patients. Currently, proper epilepsy diagnosis is dependent on expensive methods such as electroencephalography (EEG) and magnetic resonance imaging (MRI) which may be unaffordable to epileptic patients in developing countries or may sometimes be completely absent. Establishment of definitive epilepsy-associated biomarkers which can be accurately detected using portable and easy-to-use diagnostic methods would provide relief to patients as well as contribute to better prediction of drug-resistant epilepsy.

2019 OWSD Early Career Fellows



**CÉCILE HARMONIE
OTOÏDOBIGA**
Burkina Faso

Université Norbert Zongo

The control of iron and sulfide toxicities in lowland rice crops, through cultivation of iron-reducing bacteria, sulfate-reducing bacteria and iron-oxidizing bacteria.



**OSSÉNATOU
MAMADOU**
Benin

Institut de Mathématiques et de Sciences Physiques

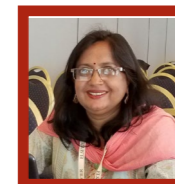
Identifying significant determiners of climate in West Africa, by studying the flux of energy, water vapor and carbon dioxide exchange between the land surface and the atmosphere for various patterns of land use and land cover.



**PRATIVA
PANDEY**
Nepal

Research Institute for Bioscience and Biotechnology

Producing useful bioactive compounds from citrus fruit waste – abundantly available in Nepal – by way of green extraction and solid-state fermentation methods.



**TISTA
PRASAI JOSHI**
Nepal

Nepal Academy of Science and Technology

Developing low-cost iron-manganese based adsorbents for efficient removal of organic methylated arsenic from water.



**MARÍA EUNICE
ENRÍQUEZ COTTÓN**
Guatemala

San Carlos University of Guatemala

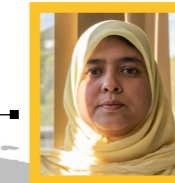
Characterizing the effect of bee pollination on coffee and macadamia nut crops in Private Natural Resources (PNR) agroecosystems in Guatemala.



**CHAKIRATH FOLAKÈ ARIKÈ
SALIFOU**
Benin

Ecole Polytechnique de l'Université d'Abomey-Calavi

Establishing best practices for the use of alternative fuels in smokehouses, in order to enhance the quality and safety of smoked fish in West Africa.



**NASRIN SULTANA
JUYENA**
Bangladesh

Bangladesh Agricultural University

Advancing sustainable and cost-effective production of high-yield dairy cattle from native Bangladeshi breeds, using vitrified embryo transfer.



**CLAUDIA SUSETH
ROMERO OLIVA DE HIRSCHMEIER**
Guatemala

Universidad del Valle de Guatemala

Developing a method of water purification and bioremediation based on aquatic plants, in order to remove cyanotoxins and other emergent contaminants in freshwater ecosystems.



**NATALIA
MONTELLANO DURAN**
Bolivia

Universidad Católica Boliviana - Santa Cruz

Identifying bioactive molecules in tropical fruits in order to understand their capabilities as functional foods (foods that produce a specific physiological response in the body).



**SOMPHOUTHONE
PHIMMACHAK**
Lao, P.D.R.

National University of Lao

Conservation of biodiversity, in particular of amphibians and reptiles, in Laos, through genetic sequencing and classification of various species.



**MERCY
BADU**
Ghana

Kwame Nkrumah University of Science and Technology

Identifying and characterizing the nutritional and medicinal properties of underutilized, non-traditional oilseeds, for incorporation into food and other industrial products.



**RITAH
NAKAYINGAH**
Uganda

Kyambogo University

Biological control of the banana bacteria wilt (BBW) disease, which can cause losses of up to 80% of banana food crops.



**VOLATSARA
BAHOLY RAHETLAH**
Madagascar

Ecole Supérieure des Sciences Agronomiques

Developing innovative agroecological management methods to control bacterial wilt of potato crops.



**PRADEEPA
BANDARANAYAKE**
Sri Lanka

University of Peradeniya

Using low-cost, low-energy Internet of Things solutions to compare crop performances and relative gene expression in tomato crops in Sri Lanka.



**EDEM
MAHU**
Ghana

University of Ghana

Reducing the spread of nutrients from fertilized farmlands into lagoons and other coastal environments, through the development of cheap, user-friendly soil nutrient testing kits based on Android/interactive voice response (IVR) technology.



**WINFRED MUENI
MULWA**
Kenya

Egerton University

Investigating the use of magnetic refrigeration, which has higher cooling efficiency and lower energy consumption than traditional vapor-compression cooling technologies.



**PRISCILLA KOLIBEA
MANTE**
Ghana

Kwame Nkrumah University of Science and Technology

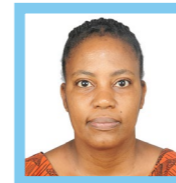
Identifying microRNA biomarkers of epilepsy in Ghanaian epilepsy patients to provide genomic data for management of epilepsy patients in Ghana as well as promote accuracy of epilepsy diagnosis.



**MAVIS
OWUREKU-ASARE**
Ghana

Ghana Atomic Energy Commission

Developing new solar drying technologies that can be used to process, add value to, and extend the shelf life of tomatoes and other fruits and vegetables and reduce high post-harvest losses.



**DINA ZAWADI
MACHUVE**
Tanzania

Nelson Mandela African Institution of Science and Technology

Developing a diagnostics tool based on deep learning that can provide early detection of three primary poultry diseases: Coccidiosis, Salmonellosis, and Newcastle disease, and that can be used on a mobile phone.



**NEWAYEMEDHIN
TEGEGNE**
Ethiopia

Debre Berhan University

Improving the stability of organic solar cells by examining factors affecting their stability problem in natural environments, to accelerate their commercialization.

EARLY CAREER WORKSHOPS

As part of the Early Career fellowship, Fellows take part in two training workshops over the course of their fellowship. An orientation workshop prepares them for managing their research grants, including training on budgeting and procurement, reporting and data management, and effective networking. In the second year of their fellowships, the Fellows participate in a second workshop focused on improving their leadership, management and outreach skills, as well as how to forge links with industry.

The orientation workshop for the 2019 Early Career Fellows took place on the campus of the International Centre for Theoretical Physics (ICTP) in Trieste, Italy from 16-20 September. It included training sessions on preparing budgets, procuring equipment, establishing and managing research teams, as well as monitoring and evaluating project results. Presenters at the workshop included: Alberto Quadrio-Curzio, President Emeritus of the Lincei National Academy; Nancy Connell, Senior Scholar at the Johns Hopkins Center for Health Security; Bruna Marini, co-founder of ULISSE BioMed; and Jennifer Thomson, OWSD President and Emeritus Professor of Molecular and Cell Biology at the University of Cape Town. The fellows also had opportunities to visit the ICTP library, where they learned about open access and ICTP's Data Sharing Initiative, and to the International Centre for Genetic Engineering and Biotechnology (ICGEB) in Trieste, for presentations on intellectual property and the technology transfer process.

The 2018 cohort of Fellows participated in their second workshop from 25-29 November 2019, in Dar es Salaam, Tanzania. The workshop was organized by the OWSD Secretariat in cooperation with three Early Career Fellows from Tanzania: Pendo Bigambo; Siana Nkya; and Lilian Kaale. The workshop began with a look back at the first year of the fellowship, including achievements, challenges, and lessons learned. This was followed over the next four days by a mix of sessions including technical advice on statistical analysis, data visualization, and intellectual property and technology transfer. Fellows also received training in research communications skills, project management dos and don'ts, and how to balance personal and professional lives. Additional discussions focused on connecting with different kinds of stakeholders and on making research relevant to policy.

“
I was grateful for the opportunity to learn about new concepts and to visit tech transfer facilities, and I also got to know potential collaborators and formed ideas for collaborations.

”
- Prativa Pandey,
2019 Early Career Fellow



2018 Early Career Fellows at the regional workshop in Tanzania



2018 Early Career Fellows
Siana Nkya and Maryse
Nkoua Ngavouka



2018 Early Career Fellow Pendo Bigambo describing her research for the "Solutions for Gender Equality" series at IDRC, Canada, in June 2019.

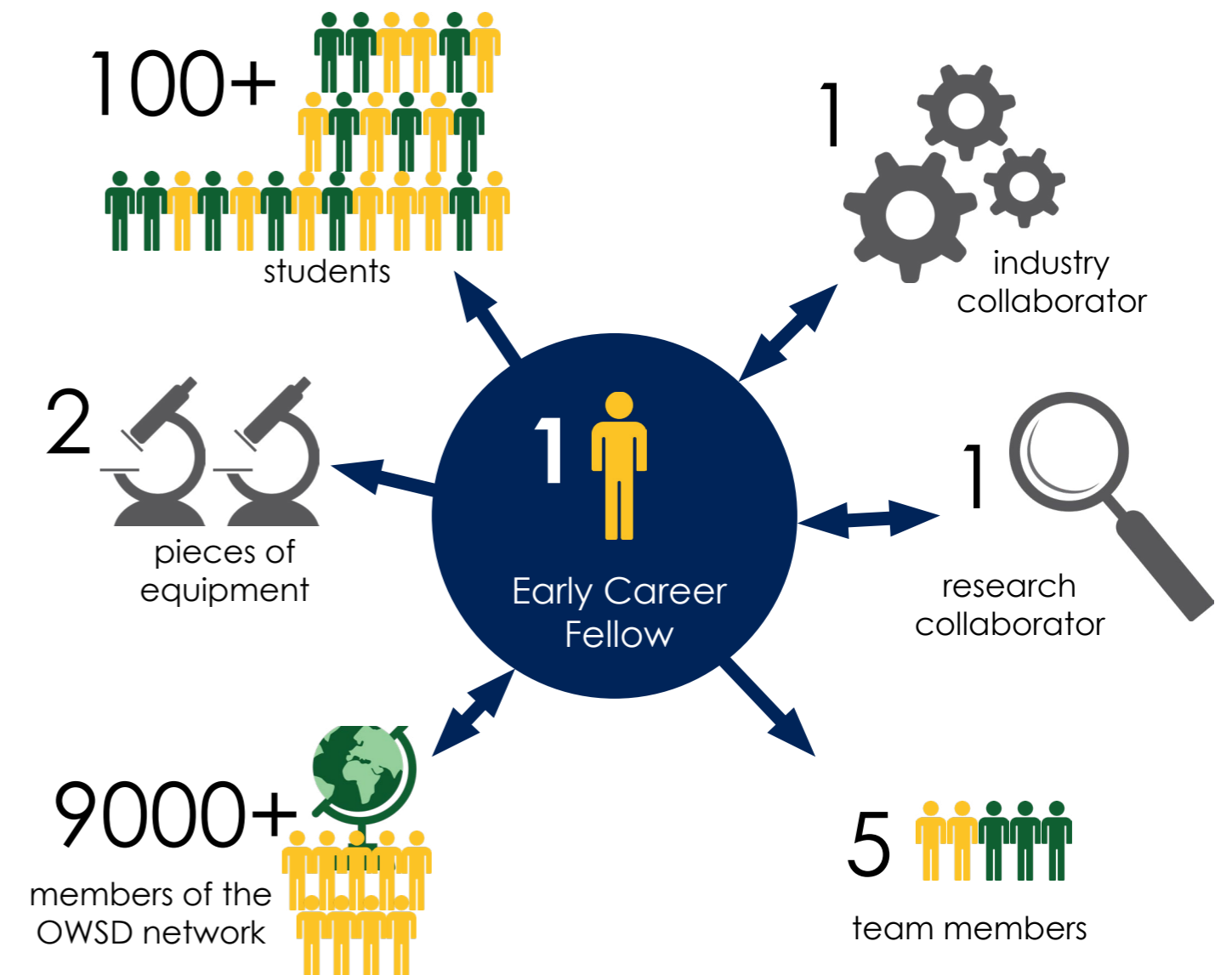
ONGOING EARLY CAREER FELLOWS

The 19 women who were awarded the first Early Career fellowships in 2018 received their first advance funding in February 2019 and were well underway with their research projects by the end of the year. Equipment and research staff were two of the Fellows' biggest expenses. The majority of the Fellows (70%) acquired new equipment with their grant funding; 38 equipment orders were processed by OWSD in total. The 2018 Fellows also hired 56 research assistants between them, and were engaged in supervising 19 students and 20 lab technicians. On average, each fellow could be shown to have had a direct impact on at least five team members within their institute.

The 2018 Fellows had begun already in 2019 to prepare articles related to their OWSD-funded research projects, with one publication published, one accepted, and two submitted. The fellows also produced an additional three articles indirectly linked to their research projects. Nine fellows reported a positive change in their H-index (or similar publication impact factor) following the OWSD fellowship award. The results of the Fellows' collaborations with industry were also visible, with two fellows submitting a total of four patent applications based on their research findings. Ten fellows reported initiating links with industry partners.

Wider impact of one Early Career fellowship award

The below figures are based on data collected from the 2018-2019 Progress Reports of the 2018 Early Career Fellows. The figures are calculated based on average reported numbers. ♀ symbolises female and ♂ symbolises male, according to the reported ratio.



SPOTLIGHT ON: MAVIS OWUREKU-ASARE



Photo credit: Glitz Africa

While she was working towards her PhD in food science at the Kwame Nkrumah University of Science and Technology (KNUST) in Ghana, Mavis Owureku-Asare was bothered by a strange paradox: Ghana, despite producing around 400,000 tons of tomatoes annually, actually relies on imports of tomato paste and many other tomato products. Tomatoes are one of the staples of Ghanaian diets, responsible for around 40% of vegetable consumption in the country. But demand for the food exceeds supply, largely because of the instability of tomatoes once they've been picked; because of their high water content, tomatoes perish quickly, causing post-harvest losses of up to 50%.

Dr. Owureku-Asare traveled to Louisiana State University in the United States on a fellowship, where she learned about many technologies to extend the shelf life of tomatoes, including vacuum and convection dryers to dehydrate them. When she returned to Ghana, however, she discovered that these methods were often either prohibitively expensive or overly complicated for farmers to use. She set her sights

on developing an affordable and effective solution more suitable to the conditions in her country—and landed on solar drying. With an abundance of sunlight, tomato farmers already practiced traditional sun-drying in many places, but Dr. Owureku-Asare wanted to optimize the solar drying process in a systematic way while also enhancing the quality of the foods produced. By the end of her PhD, she had developed a prototype passive solar dryer that could dry about 5 kg of tomatoes in a single batch.

While the solar dryer prototype held great promise, it needed to be upscaled in order to be commercially viable, capable of processing closer to 30 kg of tomatoes in one batch. Dr. Owureku-Asare applied for the OWSD Early Career fellowship for funding to produce larger scale versions of the device and to test their application in producing high quality tomato paste, tomato puree and other products. She was awarded the fellowship in 2019. With the grant funding, she will be able not only to build the larger solar dryers, but also to purchase equipment such as colorimeters and oven dryers for moisture testing, allowing her to analyze food quality in her own lab rather than send samples out for processing.

Dr. Owureku-Asare is passionate about making sure that the improved processing technologies are passed on to micro-, small- and medium-sized enterprises along the tomato value chain, particularly to women. Her research plan includes developing protocols and training programmes for tomato processors. Additionally, the benefits of the new technologies will not stop at tomatoes; she envisions that her lab will be well positioned to help farmers with post-harvest management of various types of agricultural produce. She is working with networks of farmers (the majority of whom are women) to deliver resources and training that will improve their knowledge of post-harvest systems and food product development and training, enabling them to apply this knowledge in their local communities. By creating links between food research and industry, she hopes to enhance food security both in Ghana and in Africa as a whole.



OWSD

MEMBERSHIP

OWSD at its core is about connecting and supporting women scientists in the developing world, and while its fellowship and awards programmes are essential in providing the mobility, financial sustainability and visibility that women need to advance up the career ladder, the [OWSD member network](#) provides a critical factor in making sure women stay in STEM: community. With nearly 9000 members in hundreds of countries throughout the Global South, OWSD is a truly global community of women scientists who can collaborate with, support, and inspire one another. Members can connect online through the OWSD website or in person at international and regional OWSD conferences and workshops. They also gain access to frequent opportunities for training, travel, research visits and other funding through announcements shared to international and regional OWSD mailing lists. In many countries, members organize into National Chapters, local affiliations of OWSD that organize activities and events tailored to specific needs in their countries (see pages 37-42).

In 2019, OWSD membership grew from 7161 to 8960. The large majority (87%) are full members, women scientists with a master's degree or higher in the natural sciences or social sciences. Another 8.5% are affiliate members, women from developing countries who have completed a bachelor's degree or equivalent in the sciences. The remaining 4.5% are Friends of OWSD, women and men from developed and developing countries across all disciplines who are committed to promoting the objectives of OWSD and who are not eligible for the full or affiliate membership categories. Friends of OWSD are included in the membership numbers reported here; they will be distinguished from full and affiliate members starting from 2020. 2020 will also see a preliminary reduction in membership numbers following a planned database update to reflect only active members.

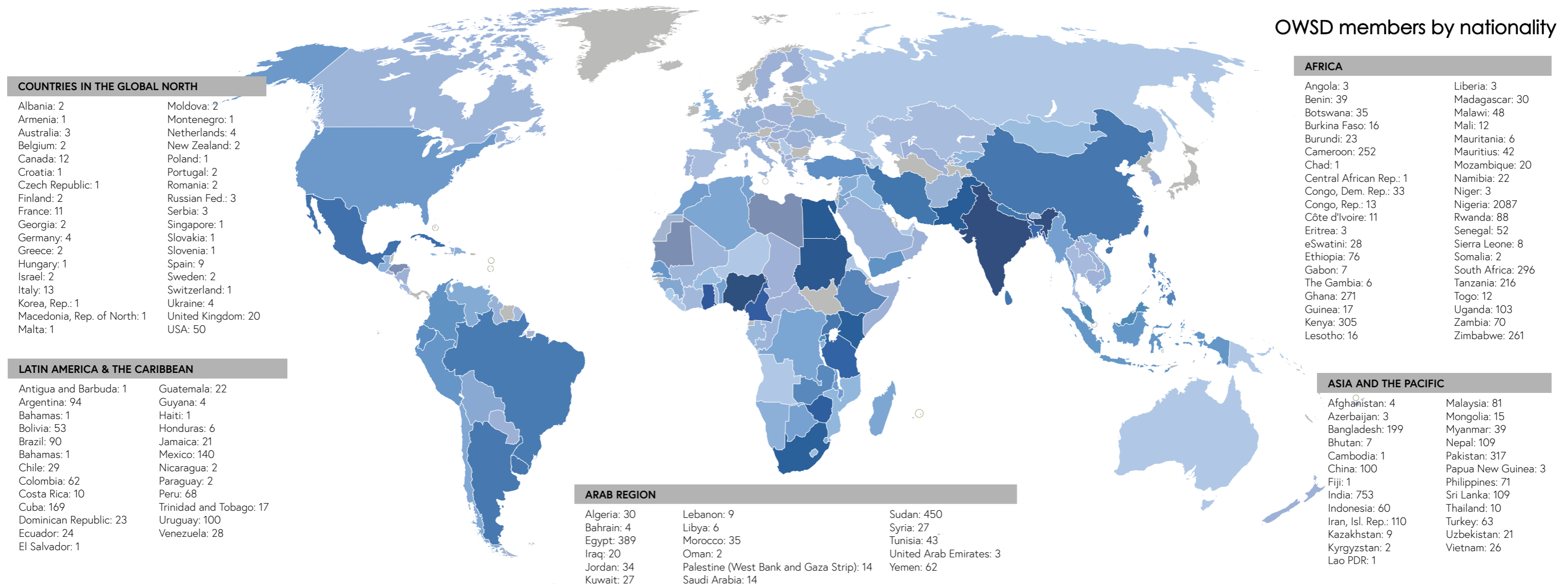
In 2019...

8960 members of OWSD

1799 new members

1564 members from least developed countries

Where from? OWSD members in 2019 come from 142 countries across six continents; 98% of members are in the Global South. Africa is home to just over half (51%) of all OWSD members, with 4535; Asia-Pacific has 2114 members (24%), followed by the Arab region with 1171 members (13%), and Latin America and the Caribbean with 968 (11%). Nigeria continues to be the country with the highest number (2087)



of OWSD members, 23% of the total. India follows with 753 members; next is Sudan (450), then Egypt (389) and Pakistan (317). Five African countries are included in the top ten: Kenya (305); South Africa (296); Ghana (271); Zimbabwe (261); and Cameroon (251). Least Developed Countries (LDCs) make up 17% of the membership, with 1564 members.

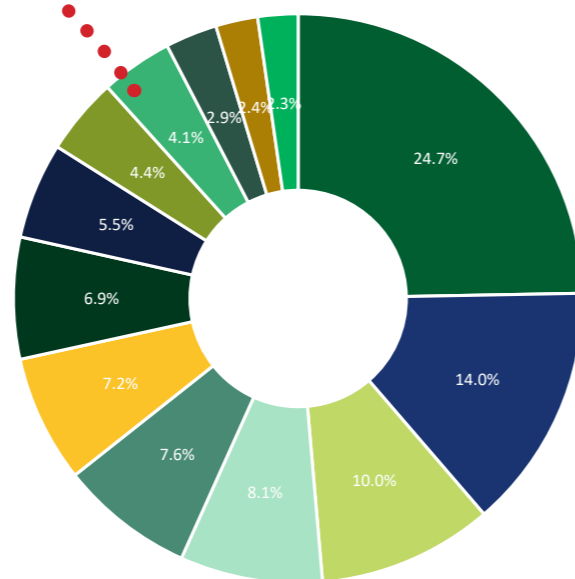
In which STEM subjects? OWSD membership is grouped into general categories of research. The most popular is biological systems and organisms (25%), then agricultural sciences (14%), followed by chemical sciences (10%), engineering sciences (8%), and medical and health sciences, including neuroscience (8%). The share of members in fields where women have historically been underrepresented (engineering, mathematics, physics, and computing and information technology) has increased slightly since 2018, from 19.8% to 21.48%. While the percentage of members in physics dropped (from 8% to 6.91%), the percentage in the other disciplines grew: from 7% to 8.1% in engineering; from 3.9% to 4.08% in mathematics; and from 0.9% to 2.28% in computing and information technology.



VERDIANA GRACE MASANJA
OWSD MEMBER, TANZANIA

Dr. Masanja, an OWSD member since 1990, is the first woman in Tanzania to hold a doctorate in mathematics. Currently Professor of Computational Mathematics at the Nelson Mandela African Institution of Science and Technology (NM-AIST), her research is concentrated in the field of fluid dynamics, specifically in mathematical modeling of coastal hydrodynamic processes and modeling and simulation of environmental hazards such as beach erosion, sediment transport and pollution. She is a dedicated supporter of women in maths, having chaired the African Mathematical Union Commission on Women in Mathematics in Africa as well as serving as National Coordinator for Female Education in Mathematics in Africa. Dr. Masanja also attended the OWSD Early Career workshop in Tanzania (see pages 27-28) as a trainer.

OWSD members by discipline



- Biological systems and organisms
- Agricultural sciences
- Chemical sciences
- Engineering sciences
- Medical and health sciences (incl. neuroscience)
- Interdisciplinary/other
- Physics
- Astronomy, space and earth sciences
- Social and economic sciences
- Mathematical sciences
- Structural, cell and molecular biology
- Computing and information technology
- Women, science and development



Members of the OWSD Kenya National Chapter at a workshop at *icipe*, the International Centre of Insect Physiology and Ecology, in Nairobi, July 2019.

OWSD NATIONAL CHAPTERS

OWSD National Chapters are groups of at least 20 OWSD members who implement OWSD's objectives at the national level. Challenges for women scientists vary largely from country to country, and so solutions must be developed with the local context in mind. National Chapters can identify the specific needs of women scientists and the barriers that prevent girls and women from embarking on STEM careers. They address these issues by organizing a range of activities, including outreach, mentoring, capacity building, and leadership training. National Chapters collaborate with the OWSD Secretariat and with other OWSD National Chapters regionally and internationally.

In 2019...
28 active OWSD National Chapters
11 new National Chapters launched

The number of National Chapters (28) has grown greatly in recent years, with more than half established in 2018 (7) and 2019 (11). These include the first two National Chapters in Latin America and the Caribbean, in Peru and Uruguay, launched in 2019. The other new National Chapters established in 2019 are in [Africa] Botswana, Cameroon, Namibia, Tanzania, and Zambia; [Asia and the Pacific] Malaysia, Pakistan, Turkey; and Jordan in the Arab region.

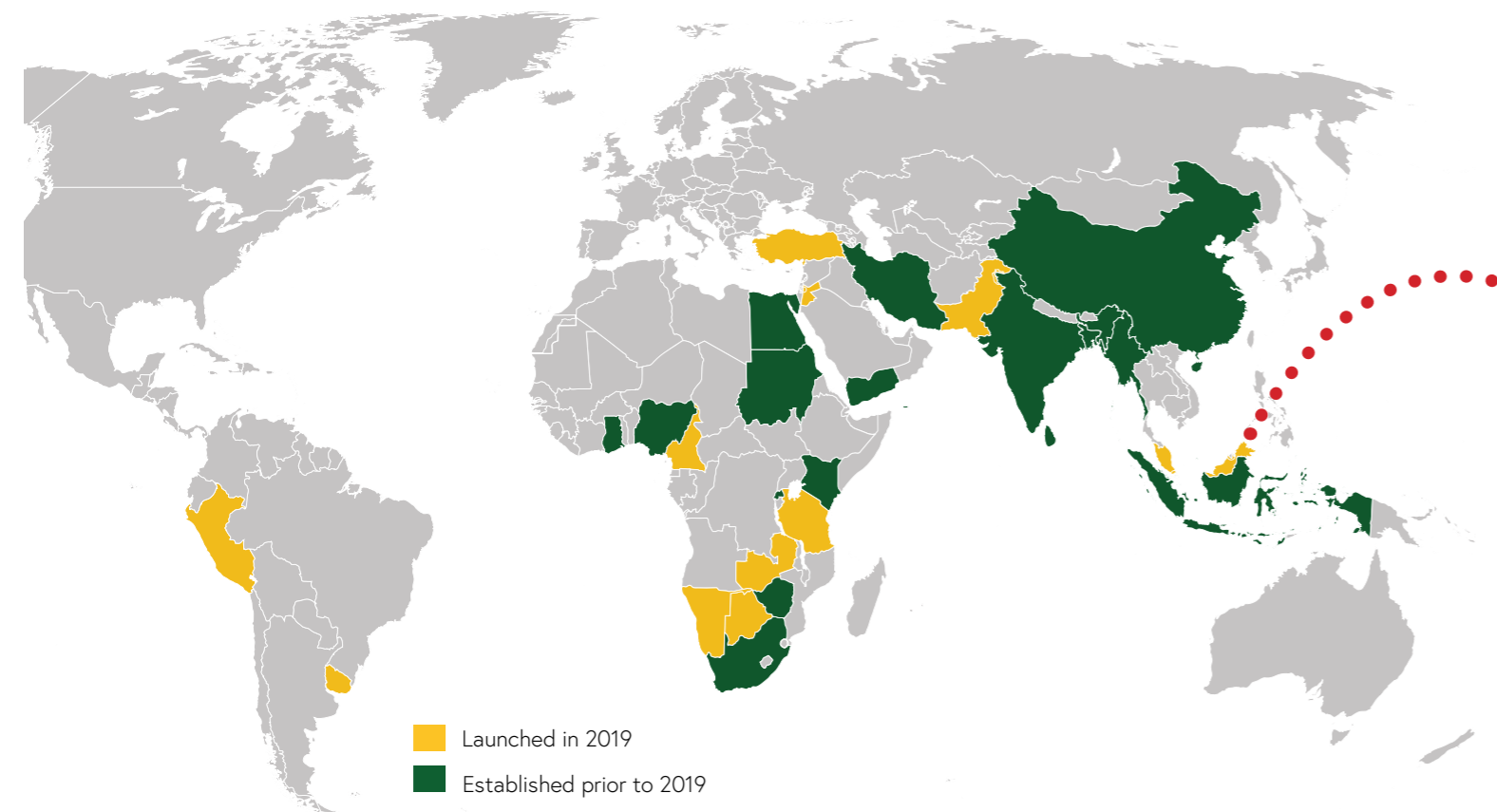
Pakistan, Turkey; and Jordan in the Arab region.

Other active National Chapters are in Bangladesh, China, Egypt, Ghana, India, Indonesia, Iran, Kenya, Mauritius, Myanmar, Nigeria, Rwanda, South Africa, Sri Lanka, Sudan, Tanzania, Yemen, and Zimbabwe.

OWSD National Chapter logos



Top row, from left to right: Bangladesh, Botswana, Cameroon, China, Egypt, Ghana, India. Second row, from left to right: Indonesia, Iran, Jordan, Kenya, Malaysia, Mauritius, Myanmar. Third row, from left to right: Namibia, Nigeria, Pakistan, Peru, Rwanda, South Africa, Sri Lanka. Bottom row, from left to right: Sudan, Tanzania, Turkey, Uruguay, Yemen, Zambia, Zimbabwe



The OWSD Malaysia National Chapter at their launch in August 2019.

The OWSD National Chapters organized dozens of activities in 2019 including workshops and training sessions, seminars and symposia, school outreach, and celebratory events or ceremonies. Here we highlight a few of their activities.

BANGLADESH

A motivational programme was organized by OWSD Bangladesh National Chapter members to encourage secondary school girls to consider STEM subjects in their future studies. Around 70 students in classes 6 to 8 at Methodist International School, Mirpur, Dhaka attended the seminar in August 2019. The school's principal and vice principal also took part. National Chapter members presented OWSD and its objectives, and National Chapter Chair Sharmin Parveen led an interactive session with the students about the importance of science in our daily lives, and career development for women in science.



EGYPT/CHINA

The Egypt and China National Chapters of OWSD collaborated in April 2019 to host a joint workshop titled 'Towards Supporting the Role of Women in Science in Developing Countries'. The one-day workshop was held at the Egyptian National Research Centre (NRC) and featured six presentations from both Egyptian and Chinese OWSD members. Mervat Foda, Chair of the OWSD Egypt National Chapter, and Farkhonda Hassan Professor at the American University in Cairo and former OWSD Vice President for the Arab region, organized the event and represented the Egypt National Chapter. The speakers from China were: Fang Xin, Chair of the OWSD China National Chapter; Fu Shuqin, the National Chapter's Coordinator; and Zhao Lanxiang and Qin Peiheng of the Chinese Academy of Science's Institute of Science and Development. The speakers covered issues including 'Creating a Favorable Environment

for the Development of Women Scientists' and 'The Transformation of Gender Policies Under the Context of Green Development'. The workshop was attended by researchers and PhD students from NRC as well as other local universities and research institutes.

KENYA

The OWSD Kenya National Chapter has been particularly active in outreach to girls in primary and secondary schools, including in rural areas. They organized sessions at Tumaini House Secondary School in the city of Nakuru, at Nairobi Chapel for recipients of

the church's Logos Scholarship Fund, and for girls from an informal settlement taking part in a one-week mentorship programme at the International Christian Centre in Imara Daima, Nai-

robi. National Chapter members spoke to the girls about the possibilities available in and through STEM careers. The Kenya National Chapter also organized a [one-day workshop](#) at *icipe*, the International Centre of Insect Physiology and Ecology, in Nairobi, which included motivational speeches, hands-on training in reference software, and poster presentations.

SRI LANKA

The Sri Lanka National Chapter of OWSD organized two workshops in 2019 to help members build critical skills for STEM careers. A workshop on "Innovative Proposals for Grant Applications" in February 2019 trained participants to develop a research question, identify appropriate methodologies to answer the question, align proposal objectives and methodologies, and finally to write a research proposal for funding. The workshop was held in collaboration with the Research Promotion and Facilitation Centre of the Faculty of Medicine, University of Colombo. A second workshop on "Empowering Scientists for Career Success" was held in March 2019, with one session focused on mentoring and networking followed by a second on effective communication and negotiation in the workplace. Around Twenty-five scientists participated in the workshop, which was organized together with US-based organization COACH, the Committee on the Advancement of Women Chemists.

TANZANIA

The OWSD Tanzania National Chapter, established in February 2019, held a two-day workshop and launch event at the University of Dar es Salaam from 22-23 November 2019, to formally launch the new Chapter and provide members with an opportunity for networking and career development training. The launch featured talks from university officials, the Tanzania Education Authority, OWSD members and Early Career fellows [Pendo Bigambo](#) and [Emilia Lyonga](#). The workshop that followed included practical sessions on writing and publishing scientific papers and on open access, delivered by AuthorAID, as well as presentations from Elaine Mungai of the Mawazo Institute and Mariam Hamisi, Senior Lecturer at the university. Seventy OWSD members participated in the launch, along with girls and boys from a local middle school class.



SPOTLIGHT ON:

OWSD MAURITIUS NATIONAL CHAPTER



OWSD Mauritius National Chapter members at the Australian High Commission for Mauritius.

Since its launch in February 2018, the OWSD Mauritius Chapter has steadily gained momentum and recognition, and is being increasingly approached by various institutions, including several NGOs, for cooperation on activities. The National Chapter works closely with the Australian High Commission for Mauritius, the Agence Universitaire de la Francophonie (AUF) and Curtin University Mauritius, among others, in addition to its host organization, the Food and Agricultural Research and Extension Institute. The National Chapter participated in a large number

of activities in 2019, including inter-university debates for students, a thesis presentation contest for PhD students, and a one-day workshop for educators held by Curtin University Mauritius.

Highlights of the year included celebrations of the National Chapter's one-year anniversary, as well as the International Day for Women and Girls in Science and International Women's Day. To mark these occasions, the National Chapter organized a series of talks for college students in April 2019 around the theme of "Youth, Science Education, Leadership and Career Perspectives," in collaboration with the Australian High Commission and the Mauritius Ministry of Education and Human Resources, Tertiary Education and Scientific Research. Speakers aimed to showcase to students the applications of science in real life situations, beyond the classical science education learned in school.

Another popular event the Chapter took part in was a series of inter-university debates organized in February-March 2019 by the Campus numérique francophone de Réduit of AUF, in collaboration with the University of Mauritius. Mauritius National Chapter members participated as members of the jury panel during the debates, and also contributed a list of questions to be debated, centered on the theme of "Education, youth and science." Both students studying science as well as those in non-scientific fields were asked to debate on the questions, with the winning team having the opportunity to take part in the regional-level finale of the competition in Madagascar. National Chapter members also participated as jury members in Mauritius's first MT180 competition. Short for "Ma these en 180 secondes," this international competition challenges PhD students to explain the essence of their doctoral thesis in 180 seconds (3 minutes), using only one PowerPoint slide.

The National Chapter also organized a workshop in November 2019 with the university Curtin Mauritius, in collaboration with the Australian High Commission, on "Using Inquiry to Create Integrated STEM: A Makerspace Project Based Approach." The workshop was aimed at primary and secondary school educators. Facilitators demonstrated and shared a number of technologies that can support teachers to help their students develop not only knowledge of STEM concepts, but also transversal competencies such as problem solving, critical and creative thinking, communication and collaboration.

The National Chapter at the end of 2019 counted 45 members and is continuing to expand its networking activities, in view of establishing additional collaborations and identifying joint projects and events for promoting scientific research and awareness in the country.



Participants in the AUF/University of Mauritius inter-university debates.



OWSD Mauritius workshop at the Mauritius Research Council on the International Day of Women and Girls in Science

OWSD AWARDS

Launched in 2012, the [OWSD-Elsevier Foundation Awards for Early Career Women Scientists](#) reward and encourage women working and living in developing countries who are in the early stages of their scientific careers, having often overcome great challenges to achieve research excellence. Awardees must have made a demonstrable impact on the research environment, both at a regional and international level, and be within ten years of receiving their PhD.

The awards are given to five scientists each year, one from each of the four OWSD regions plus one additional candidate from any of these regions. The eligible scientific disciplines rotate on a three-year cycle between the biological sciences, engineering and technology, and the physical sciences.

Each award winner receives a cash prize of USD 5,000 and is sponsored to attend the annual meeting of the American Association for the Advancement of Science (AAAS) in the USA. The winners are

presented with their awards at a special networking ceremony, and have the possibility to attend workshops and sessions at the AAAS meeting, visit local laboratories and institutions, and attend a celebratory dinner organized by the Elsevier Foundation.

The awards have an important impact on local research cultures. Previous winners say the awards have had a powerful effect, enhancing the visibility of their past work and creating new opportunities for the future. The awardees are also inspiring role models for young women in science.

2019 AWARD WINNERS

The 2019 OWSD-Elsevier Foundation Awards were given in the biological sciences: agriculture, biology and medicine. The five winners attended the AAAS annual conference in Washington, D.C., USA, from 13-17 February and presented their research to over 200 participants at the Minority and Women Scientists and Engineers Networking Breakfast on 17 February, where they received their awards. It was also announced during the award ceremony that private donors Martha Darling and Gil Omenn generously awarded each scientist an additional USD 2,500 on top of their USD 5,000 from the Elsevier Foundation. While in Washington, D.C., the awardees visited the US National Academy of Sciences and the Science and Technology Policy Institute. They were presented and celebrated at the Elsevier networking dinner where they had the opportunity to network with major scientific leaders and publishers. Three of the awardees also visited their national embassies to meet with their ambassadors. The winners developed excellent international contacts and benefitted from extensive national and international media coverage. Meet the 2019 OWSD-Elsevier Foundation Award winners below.



TABASSUM MUMTAZ
Bangladesh (Asia-Pacific)

ENVIRONMENTAL MICROBIOLOGY: For her work on the conversion of biomass and other waste materials into useful compounds using bacteria. She specializes in generating bioplastics produced by special bacteria that are cultivated from compost, food waste, and wastewater, to remove harmful materials from the environment and additionally generate renewable energy in the process.



UDUAK OKOMO
The Gambia (Africa)

PAEDIATRICS AND EPIDEMIOLOGY: For her work in defining routes of transmission of infections to neonates. Dr. Okomo's research has pointed to hospital-acquired transmission rather than maternal or community acquisition, which contributes to improved control of infections and better planning of health systems and resource distribution, thereby reducing maternal, newborn and child mortality.



NAREL PANIAGUA-ZAMBRANA
Bolivia (Latin America & Caribbean)

ETHNOBOTANY: For her work documenting and protecting traditional knowledge of plant use by indigenous populations and local communities, especially in Bolivia. She works to provide local populations with tools that allow them to make decisions about the conservation of their natural resources and associated traditional knowledge.



TISTA PRASAI JOSHI
Nepal (Asia-Pacific)

ENVIRONMENTAL MICROBIOLOGY: For her research in developing novel metal oxide adsorbents to remove harmful organic and inorganic arsenic compounds efficiently from water. Her work to create more economic and environment friendly techniques for water treatment has had a significant impact on public awareness and accountability of drinking water suppliers in Kathmandu.



AMIRA SHAHEEN
Palestine (Arab region)

EPIDEMIOLOGY: For her work investigating health care system responses to gender-based violence in primary and reproductive health services in Palestine. Her research investigates the readiness of health care systems to identify and refer women victims of violence, with the goal of improving identification and referral and bettering the women's situations.



2019 OWSD-Elsevier Foundation awardees Narel Paniagua-Zambrana, Uduak Okomo, Tabassum Mumtaz, Amira Shaheen, and Tista Prasai Joshi at the AAAS meeting in Washington, D.C., February 2019.

SPOTLIGHT ON:

NAREL PANIAGUA-ZAMBRANA



Narel Paniagua-Zambrana is dedicated to documenting and protecting traditional ways of plant use by indigenous populations and local communities, especially in her native Bolivia. But simply gaining knowledge about these uses is not her only objective: she is also a passionate advocate for providing these communities with tools that allow them to make decisions about the conservation of their natural resources and associated traditional knowledge.

Dr. Paniagua-Zambrana's research has mostly focused on native palms of the Andes and the Amazon. She has worked consistently to disseminate the results of her research among the local communities with which she works. Her research has been incorporated into educational materials in local schools and has also served as important documentation protecting these communities' traditional knowledge, ensuring that it can be passed on to future generations. Indigenous

communities are enabled to elaborate strategies to conserve their natural resources, and encouraged to share and expand their knowledge regarding their use and maintenance. She is also a strong advocate for directly involving communities in performing research projects, following the Nagoya Protocol established by the Convention on Biological Diversity which calls for fair and equitable sharing of benefits arising from the utilization of genetic resources.

Dr. Paniagua-Zambrana was born in La Paz, Bolivia, and became interested in science from an early age; she credits her father, a geologist, for sparking this interest, teaching his young daughter about the rocks and natural world in the high mountain areas where they lived. Having also witnessed the difficult lives of miners in the tin mines where her father worked as an engineering supervisor, she saw education and science as the keys to improving peoples' lives and livelihoods. She went on to pursue a PhD in Biological Sciences, which she received from the Autonomous University of Madrid in Spain in 2016. She now works as an Associate Researcher at Bolivia's National Herbarium at the Institute of Ecology, Universidad Mayor de San Andrés. She additionally works with undergraduate, Masters and PhD students around the globe who are interested in ethnobotanical studies, many of them young women scientists.

Winning the OWSD-Elsevier Foundation Award for Early Career Scientists in 2019 brought important recognition to Dr. Paniagua-Zambrana's work in her country and abroad. Upon returning to Bolivia after

the award ceremony, she was invited to meet individually with then-President Evo Morales. In addition to discussing the importance of investing in science generally and in protecting indigenous knowledge, the President also agreed with Dr. Paniagua-Zambrana's suggestion to declare a special day to celebrate Bolivian women in science. She also gained the attention of the World Food Programme, who honored her with a street mural in her likeness in La Paz, completed in March 2019; the mural is intended to inspire young girls who might be interested in following her path into the sciences.



FINANCIAL SUMMARY

OWSD is funded by three donors. Sida, the Swedish International Development Cooperation Agency, has funded the PhD programme since 1998. In 2018, Canada's International Development Research Center (IDRC) became OWSD's second major donor, with the commitment to fund the Early Career Fellowship programme. The Elsevier Foundation has funded the OWSD Awards programme since 2012.

Financial income and expenditure for the year 2019 are reported in the tables below.* Expenditure is organized according to programme areas.

INCOME	AMOUNT (USD)
Balance brought forward from 2018	979,006.28
International Development Research Centre (IDRC), Canada	1,500,393.23
Swedish International Development Agency (Sida)	1,338,046.90
Elsevier Foundation, USA	112,350.00
Contributions from OWSD members	385.71
Interest	161,128.00
TOTAL INCOME	4,091,310.12

EXPENDITURE	AMOUNT (USD)		
	APPROVED BUDGET	REVISED BUDGET	SPENT
(1) Increasing women's participation, leadership and influence in science, technology and innovation in low and middle income countries (PhD fellowship programme)			
1.1 Fellowships (PhD)	707,000.00	717,785.00	713,537.22
1.2 Travel (PhD fellows)	75,000.00	75,497.00	75,496.80
1.3 Regional workshop	51,000.00	73,250.00	47,914.61
1.4 Monitoring	45,000.00	41,445.00	1,067.46
1.5 Travel - Executive Board and staff	20,000.00	20,440.00	10,290.17
1.6 Website/communications	15,000.00	14,479.00	8,952.84
1.7 Staff and office space	325,000.00	308,574.00	314,153.40
1.8 Additional funds received in previous year	214,510.00	214,601.00	205,907.62
1.8.1 PhD	69,010.00	69,010.00	69,010.00
1.8.2 Travel (PhD fellows)	34,430.00	34,430.00	34,430.00
1.8.3 Monitoring	13,750.00	13,750.00	13,313.83
1.8.4 Travel - Executive Board and staff	43,370.00	43,370.00	36,336.01
1.8.5 Website/communications	2,830.00	2,830.00	2,829.53
1.8.6 Staff and office space	51,120.00	51,211.00	49,988.25
Subtotal for (1)	1,452,510.00	1,466,071.00	1,377,320.12

*The budget shown also contains income and expenditure for GenderInSITE, a partner programme of OWSD that is budgeted under the OWSD programme for administrative purposes.

EXPENDITURE	AMOUNT (USD)		
	APPROVED BUDGET	REVISED BUDGET	SPENT
(2) Supporting women's leadership in science, technology and innovation in scientifically and technologically-lagging countries (2017-2021) (Early Career Fellowship programme)			
2.1 Personnel	259,000.00	259,000.00	182,013.29
2.2 Consultants	10,000	10,000	0
2.3 Evaluation	45,000.00	45,000.00	0
2.4 Research and equipment	769,000.00	951,842.00	849,500.49
2.5 International travel	15,000.00	15,000.00	3,452.44
2.6 Training	90,000.00	96,894.00	110,380.64
2.7 Indirect costs	154,440.00	154,596.00	65,233.34
2.8 Additional funds received from IDRC in previous year	355,990.00	355,990.00	299,896.71.00
2.8.1 Personnel	45,590.00	45,590.00	35,296.89
2.8.2 Consultants	15,500.00	15,500.00	9,363.45
2.8.3 Evaluation	28,400.00	28,400.00	10,612.21
2.8.4 Research and equipment	158,100.00	158,100.00	155,442.80
2.8.5 International travel	7,600.00	7,600.00	7,459.70
2.8.6 Training	25,800.00	25,800.00	13,736.32
2.8.8 Indirect costs	75,000.00	75,000.00	67,985.34
Subtotal for (2)	1,698,430.00	1,888,322.00	1,510,476.91
(3) Gender in Science, Innovation, Technology and Engineering (GenderInSITE)			
3.1 Steering Committee	20,000.00	18,370.00	16,918.03
3.2. Regional Focal Points	50,000.00	48,584.00	41,245.00
3.3 Workshops/activities	32,000.00	33,321.00	1,443.10
3.4 Communications	10,000.00	15,862.00	1,167.42
3.5 Travel	10,000.00	9,185.00	9,184.85
3.6 Staff costs	110,000.00	113,678.00	42,915.43
3.7 Additional GenderInSITE funds received in previous year	82,820.00	82,820.00	76,085.47
3.7.1 Workshops	45,690.00	45,690.00	42,519.31
3.7.2 Steering Committee	5,000.00	5,000.00	5,000.00
3.7.3 Regional Focal Points	7,510.00	7,510.00	7,510.00
3.7.4 Communications	3,090.00	3,090.00	1,716.75
3.7.5 Travel	6,150.00	6,150.00	4,754.00
3.7.6 Staff costs	15,380.00	15,380.00	14,585.41
Subtotal for (3)	314,820.00	321,820.00	188,959.30
(4) OWSD-Elsevier Foundation Awards for Early Career Women Scientists in the Developing World			
4.1 Awards	50,000.00	50,000.00	70,649.77
4.2 Alumnae Programme	15,000.00	46,350.00	11,131.48
4.3 Community building	5,000.00	0	0
4.4. Staff costs	10,000	10,000	10,000
Subtotal for (4)	80,000.00	106,350.00	91,781.25
(5) Additional core activities			
5.1 Fellowships PhD funds	305,500.00	530,355.00	346,334.00
5.2 Staff costs	80,000.00	147,103.00	59,678.75
Subtotal for (5)	385,500.00	677,458.00	406,012.75
Management costs	32,585.00	54,867.00	34,845.58
TOTAL EXPENDITURE	3,963,845.00	4,514,888.00	3,609,395.91
Savings on prior years' obligations			675,459.59
Excess (shortfall) of income over expenditure			1,157,373.80

OPERATIONAL STRUCTURE

OWSD is a programme unit of UNESCO, the United Nations Educational, Scientific and Cultural Organization, and is administered under TWAS, the World Academy of Sciences.

EXECUTIVE BOARD

OWSD is governed by an Executive Board which is elected at each General Assembly, held every four years. In 2019 the Executive Board meeting was hosted by the Chinese Academy of Sciences in Beijing, China, and linked to a one-day International Symposium on Women Scientists in Innovation and Entrepreneurship with EB members as guest speakers. The Executive Board includes a President (from any of the four OWSD regions in the developing world), four Vice Presidents (one from each region), and four Regional Members (one from each region), plus the immediate past President. The current Executive Board was elected at the 5th General Assembly in Kuwait in 2016. Currently there is no Regional Member for Latin America and the Caribbean.

PRESIDENT

Jennifer A. Thomson, South Africa

VICE PRESIDENTS

Nashwa Eassa, Sudan (*Arab region*)

Atya Kapley, India (*Asia-Pacific region*)
Olubukola Oluranti Babalola, Nigeria (*Africa region*)
Jana Rodríguez Hertz, Uruguay (*Latin America and the Caribbean region*)

REGIONAL MEMBERS

Esi Awuah, Ghana (*Africa region*)
Hasin Anupama Azhari, Bangladesh (*Asia-Pacific region*)
Huda Basaleem, Yemen (*Arab region*)

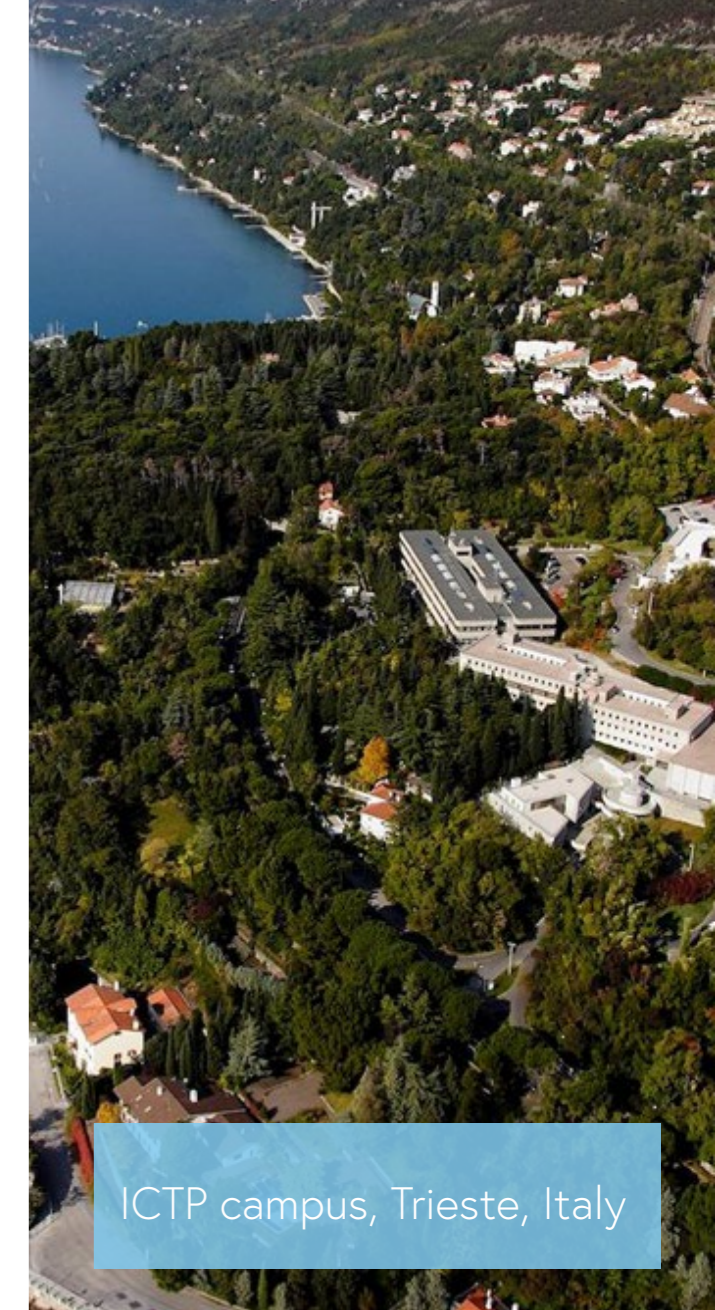
IMMEDIATE PAST PRESIDENT

Fang Xin, China

SECRETARIAT

The Secretariat of OWSD is hosted on the campus of the Abdus Salam International Centre for Theoretical Physics (ICTP) in Trieste, Italy.

Tonya Blowers - **Coordinator**
Evgenia Markvardt - **Programme Manager**
Alexandra Cussianovich - **Membership**
Fiona Dakin - **National Chapters/GenderInSITE**
Lucia Fanicchi - **External Relations**
Erin Johnson - **Communications**
Tanja Bole - **Fellowships**
Gioriga Danelon - **Fellowships**
Erika Hrvatic - **Fellowships**
Marina Juricev - **Fellowships**
Zabeeh Ullah Sahil - **Fellowships**



ICTP campus, Trieste, Italy



OWSD Executive Board members at their October 2019 meeting in Beijing

OWSD is grateful to the following donors for their generous support of OWSD programmes in 2019:

Swedish International Development Cooperation Agency (Sida)

PhD fellowship programme and Secretariat support



International Development Research Centre (IDRC) - Canada

Early Career fellowship programme and Secretariat support



The Elsevier Foundation

Awards programme



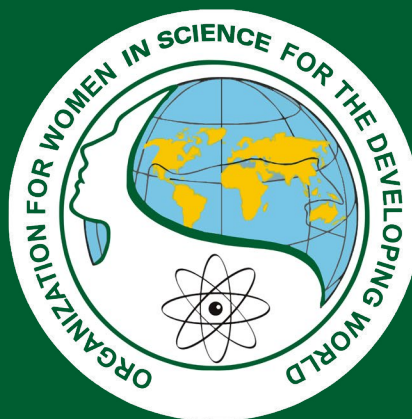
OWSD additionally thanks the following private donors who contributed to our programmes in 2019:

Prof. Dianne Jolley - Women in Chemistry NSW

This report was written and designed by Erin Johnson, OWSD Communications Administrator, with support from Tonya Blowers, Tanja Bole, Alexandra Cussianovich, Fiona Dakin, Giorgia Danelon, Lucia Fanicchi, Anamaria Golemac Powell, Erika Hrvatic, Marina Juricev, Evgenia Markvardt, and Sahil Zabeeh Ullah.



United Nations
Educational, Scientific and
Cultural Organization



The Organization for Women in Science for the Developing World

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