



science by women

Programme For Women, Science,
Technology and Innovation in Africa

8th Edition



Overview

The Women for Africa Foundation (FMxA), in line with its mission of contributing to the development of Africa through the drive of its women, launched in 2014 the SCIENCE BY WOMEN program to promote African women's leadership in scientific research and technology transfer. The main goal is to enable women scientists to tackle the great challenges faced by Africa through research in health, agriculture and food security, water, energy and climate change, which can be transferred into products and technologies of great impact on people's lives.

The program's ultimate goal is to enable women to play a leading role in the transition of Africa to a knowledge-based and innovation-led economy.

To achieve this ambitious goal, FMxA collaborates with the Spanish 'Severo Ochoa' and other Centers of Excellence, whose prestige is unanimously recognized throughout Spain and internationally, thereby ensuring the excellence of scientific research in various fields. For the 1st Edition, the associated funding centers were the Spanish National Cancer Research Center, the Institute of Photonic Sciences, the Spanish National Center for Biotechnology, the Carlos III Health Institute, and the Institute of Mathematical Sciences.

After the success of the 1st Edition, a total of 29 Centers of Excellence from different regions of Spain have joined the program in the subsequent eight editions, and more than 120 African researchers have benefitted from it.



The programme

Justification

The growth of African economy has proven constant and has not collapsed despite the fall in the prices of cherished commodities. Indeed, the 2023 African Economic Outlook from the African Development Bank shows that the continent's general economic performance has improved. Its Gross Domestic Product (GDP) will average around 4% in 2023 and 2024, which is higher than projected global averages of 2.7% and 3.2%. This also shows that all the continent's five regions remain resilient with a steady outlook in the medium-term even though Africa's GDP slowed to 3.8% in 2022, from 4.8% in 2021, in the context of the COVID-19 crisis. What is more, according to International Monetary Fund's most recent World Economic Outlook, Libya (17.5), Senegal (8.3) and Congo Democratic Republic (6.3) are the three African countries with the highest GDP growth.

This vitality is not going to fade, since the generation of 15-29-year-olds, which accounts for 60% of the population, needs consumer goods, lodging, financial services, technology and telecommunications. This population includes superb women and men, engineers, scientists and biotechnologists, with the ability to produce those goods and to play an active role in an industrial revolution.

Moreover, Africa's alleged shortages are also opportunities: the use of surgical robotics is developing quickly, telemedicine is proving to be an optimal solution in isolated places, and the use of renewable energies is already benefiting the rural communities of the Sahel region. Therefore, the investors that are wagering on these opportunities and on the vitality

of the markets will largely benefit from their investment in the long term.

Despite this growth, the African Union estimates that around 70.000 qualified African professionals leave the continent each year. In 2015, 86% of all African-educated physicians working in the U.S. were trained in Egypt, Ghana, Nigeria, and South Africa. According to African Union estimates, it costs \$21,000 to \$59,000 to train each of these professional physicians, who then migrate to seek better opportunities elsewhere. This means Africa loses billions of dollars in education and training costs.



Many factors contribute to this trend. Some extreme factors include war and political instability. However, while both men and women mention the lack of mentoring, resources and funding as key issues, women mostly point to gender inequality and the lack of role models, managerial support and work-life balance.

The Science by Women program is built around the ability of African women scientists to innovate. In this model, science, research and innovation must play a key role in accordance with the standards of the globalized world. This should be done so that, firstly, African people may be able to live better lives, and also to achieve the transition of Africa from a receiver to a generator of development. And African women wish to be and should be involved since they suffer most from unstructured development. Thus, they have a strong desire and full right to be part of the solution based on human welfare, social inclusion and environmental sustainability.

Although in Africa the gender gap in technological and scientific fields remains wide, the latest UIS (UNESCO Institute for Statistics) data on research and experimental development (R&D) reveals variation across countries. The percentage of female researchers relative to the total number of researchers in a country is an important indicator of progress and development. Compared to a global average of 30%, UIS data shows over 54% of researchers in Tunisia are women, 42% in Egypt and 31,4% in sub-Saharan Africa. However, other countries like Mali and Togo do not even reach 12%.

Foto: Ilustración de Precious Narotso, Nairobi, Kenia.



General Purpose

The Science by Women program aims to empower African women researchers in STEM (Science, Technology, Engineering and Mathematics) and enable them to play a leading role in the transition of Africa to a knowledge-based and innovation-led economy, especially in the following areas which respond to the priorities of Africa: Health and Biomedicine, Energy, Water and Climate Change and Agriculture and Food Security.

Direct beneficiaries of the 6-month fellowships in associated Spanish centers are selected from senior African women researchers with at least 3 years of postdoctoral experience, in order to:

- ◇ Ensure the knowledge transfer from senior fellows to their junior teams and doctoral students.
- ◇ Minimize the risks of brain drain, which could reduce the impact of the program.

Specific objectives are

- 1.** To strengthen the skills and capabilities of the selected African scientists.
- 2.** To make the African researchers and their findings visible in the international scientific community.
- 3.** To empower African scientists so that they can be role models for other young girls and encourage them to get into STEM careers.
- 4.** To enhance scientific cooperation between Spanish and African centres and promote exchange programs in order to foster better mutual knowledge.
- 5.** To build a network of African women researchers who both exhibit and provide professional development, mentorship and support to new participants.



In order to achieve the mentioned objectives, FMxA carries on different activities, such as:

- ◇ Drafting Rules and Guidelines and publishing the call for fellowships for each edition after approval of the Governing Board.
- ◇ Shortlisting candidates.
- ◇ Supporting selected fellows with their visa applications and liaising with Spanish consulates and embassies.
- ◇ Supporting the participation of fellows in international conferences as well as the publication of their findings in scientific reviews.
- ◇ Supporting and following up on the social integration of fellows.
- ◇ Enhancing the visibility of fellows, associated centers and sponsors in social networks and media.



Methodology

The Women for Africa Foundation organises and manages the Science by Women programme in close collaboration with the associated research centres.

The **Governing Board**, formed by the representatives of the Spanish centres, oversees the technical and operational aspects of the fellowship programme. It is headed by María Blasco, Director of the Spanish National Cancer Research Centre.

A **Scientific Committee**, chaired by María Teresa Fernández de la Vega, **President of FMxA**. Its members are prestigious Spanish, African and American luminaries from different research areas.

The program has also widened its geographical outreach. In fact, while only centers in Barcelona and Madrid were included in the consortium the first year, currently most Spanish regions are represented in the consortium.



Direct and indirect beneficiaries

The direct beneficiaries of the program are the fellows selected by the host centers.

The indirect beneficiaries are the students, doctoral researchers and junior members on the fellows' teams.

So far, the impact is highly significant. Most fellows have published their findings in or submitted them to international scientific journals (Elsevier, Royal Society, NOVA Publishers...), participated in prestigious conferences (Academy of Science of France, American Society of Tropical Medicine and Hygiene, Baltimore)

and Massive Open Online Courses (SDG Academy...). They have acquired leadership skills, enabling them to be promoted to decision-making positions on their return to their centers or universities of origin.

Moreover, Women for Africa Foundation has facilitated the setting up of N.O.W. IS AFRICA (Network of Women Innovating in Science in Africa) with the aim to enhance the interaction between fellows and to offer specific training programs.

Funding

Science by Women is the flagship program of FMxA. It has grown in a spectacular fashion, from 5 associated centers to more than 30 expected in the 9th edition, from 9 beneficiaries to 120, from 6 African countries to 20, and from 30 applications to more than 300.



Science by Women in high schools

The programme has presented its first pedagogical project “Science by Women in high schools” which aims to bring science closer to the everyday lives of young people through various activities from a feminist and anti-colonialist perspective.

The general objectives of this initiative, in which the fellows are the leaders, are:

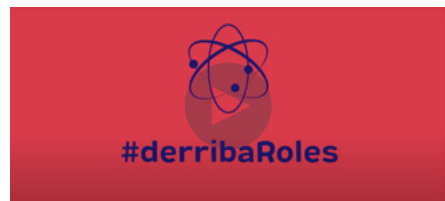
- ◇ To learn about and recognize the importance of science in our daily lives.
- ◇ To make women scientists and science by women more visible in Spain and on the African continent.
- ◇ To break sexist and racist stereotypes.
- ◇ To encourage the study of STEM careers among girls and young women.

According to UNESCO, the gender gap in STEM becomes particularly apparent in upper secondary education, when girls frequently elect to pursue other career paths rather than advancing their studies in mathematics and science. Only 35% of higher education STEM students are women. Studies also indicate that women in STEM are paid less, publish less and progress less than male peers. This is a loss for the science, technology and innovation field - and for society. While women represent 33.3% of all I researchers, women comprise only 12% of national science academies’ members.

This is the reason why the programme has decided to carry out pedagogical activities in schools, where students can participate and interact with our fellows.

By breaking gender stereotypes embedded in learning and socialization processes, women in STEM, especially African women, will gain recognition and representation, and young women and girls will be encouraged to pursue science.

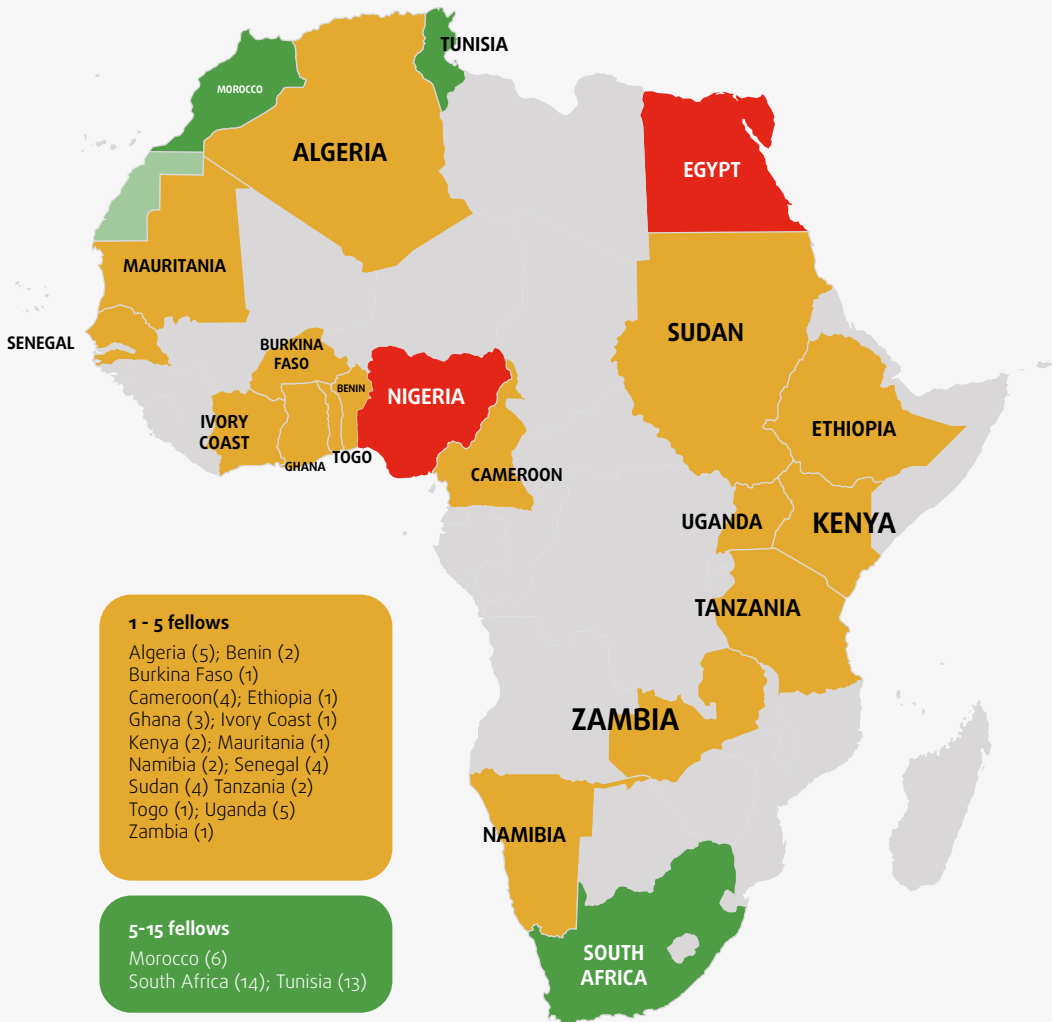
You can watch the videos introducing the activities here:





Beneficiaries

To meet the fellows click
THE MAP



1 - 5 fellows

Algeria (5); Benin (2)
Burkina Faso (1)
Cameroon(4); Ethiopia (1)
Ghana (3); Ivory Coast (1)
Kenya (2); Mauritania (1)
Namibia (2); Senegal (4)
Sudan (4) Tanzania (2)
Togo (1); Uganda (5)
Zambia (1)

5-15 fellows

Morocco (6)
South Africa (14); Tunisia (13)

15-25 fellows

Egypt (25); Nigeria (24)

Associated Research

Centres

BioCruces Bizkaia Health Research Institute (BC)

Kronikgune Research Center

Deusto Institute of Technology (DeustoTech)

Basque Center for Climate Change (BC₃)

Donostia International Physics Center (DIPC)

Biodonostia Health Research Institute (Biodonostia HRI)

Basque Center for Applied Mathematics (BCAM)

Basque Center for Macromolecular Design and Engineering POLYMAT Fundazioa

Vall d'Hebron Institut de Recerca (VHIR)

Institute of Photonic Sciences (ICFO)

Institute of Materials Science of Barcelona (ICMAB-CSIC)

Centre for Genomic Regulation (CRG)

Barcelona School of Economics (GSE)

Institute of Science and Food Technologies (ICTA)

Prince Felipe Research Center (CIPF)

Fundación para la Investigación del Hospital Cínico de la Comunidad Valenciana - INCLIVA

Institute for Sustainable Agriculture (IAS)

Oceanic Platform of the Canary Islands (PLOCAN)

Institute of Astrophysics of the Canary Islands (IAC)

Biomedical and Health Research Institute (IUIBS)

Spanish National Cancer Research Centre (CNIO)

Spanish National Centre for Biotechnology (CNB)

Carlos III Health Institute (ISCIII)

Institute of Mathematical Sciences (ICMAT)

Center for Research in Agricultural Genomics

Institute for Neuroscience (IN)

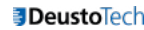
Material Physics Center (CFM)

Repsol Technology Center Campus of International Excellence in Agrifood

Instituto de Ciencias y Tecnología Ambientales (ICTA-UAB)

Associated Research Centres

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Sponsors



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