Box 3.4: Access to finance biggest obstacle for women tech entrepreneurs in Africa

In order to understand how African women entrepreneurs are using science and technology, UNESCO commissioned a survey in 2019 of 459 women from ten African countries: Benin, the Democratic Republic of Congo, Djibouti, Ghana, Madagascar, Morocco, Mozambique, Senegal, South Africa and Tunisia.

Both rural and urban women were interviewed across different fields of industry. The majority of women had started a business in the food sector (30%) or in clothing and other textiles (14%), followed by web platforms (8%), beauty and personal care (7%) and digital marketing and services (4%).

Although engineers (less than 1%) and web designers (8%) made up a small share of the group surveyed, over 80% of respondents said that they used science or technology on a daily basis. About 25% had innovated by developing a new process or product.

Patenting was well understood but not always sought after, usually due to the cost or administrative burden. On average, 12% of entrepreneurs held a patent. Ghanaian women were the most likely to have patented their process or product, with over half reporting an invention and 19% having registered a patent.

Women from the Democratic Republic of Congo were most likely (91%) to have heard of a local innovation hub and to have been assisted by one (69%). They were followed by Ghanaians, with 57% and 25%, respectively. On average, 41% of the entrepreneurs knew of the existence of a local innovation hub but only 26% had been assisted by a start-up incubator in launching their business. It was common for the entrepreneurs to assume that they did not qualify for this form of support.

Access to finance was the most commonly identified barrier to starting a new business, faced by 67% of respondents. Only 18% reported having obtained a bank loan and less than 2% had accessed microfinance. Banks remain reluctant to finance start-ups, which they consider a risky investment, and women often lack sufficient financial guarantees; their home may be registered in their husband’s name, for instance. Some respondents have also hesitated to invest in their own company over concerns about political instability in their country.

Some 17% of the women had faced challenges in obtaining premises or land for their business, the second-greatest barrier reported after lack of access to finance. Being able to rent office space was considered vital for both practical and societal reasons, because ‘people are sensitive to appearances and therefore [if we] make an appointment [with a client] in a cafe, they do not take us seriously’.

Only 10% of respondents cited social or family resistance to their project, although many recalled their determination to turn a blind eye to criticism. Encouragingly, 84% said that their partner was either supportive or very supportive of their project.


Israel considers computer science to be an essential subject and has allocated funds to augmenting the 32% share of women among students of mathematics, statistics and computer sciences in 2017. According to data from the Israeli Council for Higher Education, the number of women studying computer science at tertiary level has already almost doubled in eight years, from 2,658 (2009) to 5,237 (2017) (see chapter 16).

Many of the countries displaying gender parity among graduates in ITCs and other STEM fields have majority-Muslim populations (Table 3.1). Azerbaijan, Kuwait and Malaysia have some of the highest ratios of female engineers in the world (Table 3.2). At the Mohammed bin Rashid Space Centre in the United Arab Emirates, four in ten employees are women. The lead scientist is 33-year-old Dr Sarah Al Amiri, who served as deputy manager of the project which sent the Hope Probe into Mars’ orbit on 14 July 2020 from a launch site in Japan. The country’s youthful space industry – the average age of staff at the centre is 27 years – is one outcome of the government’s drive to ‘emiratize’ the country’s skilled workforce, in order to reduce reliance on foreign expatriates (see chapter 17).

In the Republic of Korea, more women are enrolling in engineering programmes than ever before; they accounted...