However, the present financial crisis has compromised the advances made by burgeoning start-ups and investments have most likely stalled.

The Beirut Digital District, which provides co-working spaces, concentrates many of the country’s start-ups. As of 2017, the district reportedly hosted 70 companies employing 1,200 people (Les Échos, 2017) and had begun a process of expansion (Daoud, 2017) that has likely stalled in 2020.23

A survey conducted over 2017–2018 of tech start-up founders, co-founders or partners found that navigating the regulatory framework and accessing local talent were the two greatest impediments to entrepreneurship (ABI, 2018). With regard to the wider innovation system, the main barriers identified were a weak collaborative culture, a lack of funding for researchers at the prototyping stage, an insufficient number of incentives and reward mechanisms and poor intellectual property protection at the national level (Berytech, 2020).

**Research expenditure likely to fall**

Lebanon’s *Science, Technology and Innovation Policy* (2006) continues to serve as the country’s main strategic plan in related areas (Zou‘bi et al., 2015).

Through its Grant Research Programme, the CNRS-L allocated an estimated US$ 2.5 million to support 249 projects over 2014–2016. The number of projects varied little for the call covering 2018–2019 (239) but the amount of funding doubled to US$ 5 million. The bulk of the budget allocation was evenly distributed between basic sciences and engineering, on the one hand, and medical sciences, on the other (Figure 17.7).

This growth in expenditure followed a restructuring of the Grant Research Programme in 2017. Project costs are now shared by the CNRS-L with one of the 16 participating universities. There had been plans to raise funding for 2019–2020, with a focus on: applied AI and data analytics; crisis and emergency management; environment and waste management; and the social sciences and humanities. However, officials told the CNRS-L forecast a steep decline in expenditure over this period.

**National charter for research ethics**

In July 2016, Lebanon became one of the first Arab countries to adopt a national charter for research ethics, when the CNRS-L released the *Charter of Ethics and Guiding Principles of Scientific Research in Lebanon*.

The charter states that research should comply with international standard-setting instruments like the *Helsinki Declaration* on medical research. It also calls upon institutions to ensure that research projects targeting human subjects directly receive special approval from the host institution’s ethical committee.

The CNRS-L also contributed to drafting the *Charter of Ethics of Science and Technology in the Arab Region* (2019), the result of an 18-month multistakeholder consultation process (Box 17.4).

In March 2019, the CNRS-L and the Lebanese National Commission for UNESCO launched the National Observatory for Women in Research to boost women’s participation in scientific research and, thereby, help build a knowledge society (Al Akhbar, 2019).24

**LIBYA**

**Void has been filled by budding entrepreneurs**

Armed conflict reignited in 2015 in Libya. With minimal governance and broken public institutions (World Bank, 2019b), Libya counts among the world’s most fragile states; in 2017, approximately 1.3 million people were in need of humanitarian assistance, according to the United Nations High Commissioner for Refugees.

Libyan research institutes have endured immense structural damage and university laboratories have experienced a shortage of spare parts and consumables. There have been some improvements, though, as concerns the exercise of intellectual freedom and internal academic mobility (LOOPS, 2019).

*Libya 2020 Vision*, released in 2014 by the Libyan Institute for Advanced Studies, identified STI as being fundamental to the country’s development agenda, alongside openness, human rights, gender empowerment and six other elements. *Libya 2020 Vision* foresaw developing a strategy for STI and technology transfer, dedicating more resources to R&D and improving the quality of science teaching.

The *National Strategy for Science, Technology and Innovation* was duly approved by the National Planning Council in 2014 but the present authors have been unable to confirm the status of implementation.

Within the Ministry of Economy and Industry, the Permanent Technical Committee for Measuring Innovation plans to develop indicators and standards against which to...