A world in search of an effective growth strategy
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FOREWORD
For two decades now, the UNESCO Science Report series has been mapping science, technology and innovation (STI) around the world on a regular basis. Since STI do not evolve in a vacuum, this latest edition summarizes the evolution since 2010 against the backdrop of socio-economic, geopolitical and environmental trends that have helped to shape contemporary STI policy and governance.

More than 50 experts have contributed to the present report, each of them covering the region or country from which they hail. A quinquennial report has the advantage of being able to focus on longer-term trends, rather than becoming entrenched in descriptions of short-term annual fluctuations which, with respect to policy and science and technology indicators, rarely add much value.

KEY THEMES ON STI POLICY AND GOVERNANCE

Geopolitical events have reshaped science in many regions
The past five years have witnessed major geopolitical changes with significant implications for science and technology. To name just a few: the Arab Spring in 2011; the nuclear deal with Iran in 2015; and the creation of the Association of Southeast Asian Nations (ASEAN) Economic Community in 2015.

At first sight, many of these developments have little to do with science and technology but their indirect impact has often been significant. In Egypt, for instance, there has been a radical change in STI policy since the Arab Spring. The new government considers the pursuit of a knowledge economy as being the best way to harness an effective growth engine. The Constitution adopted in 2014 mandates the state to allocate 1% of GDP to research and development (R&D) and stipulates that the "state guarantees the freedom of scientific research and encourages its institutions as a means towards achieving national sovereignty and building a knowledge economy that supports researchers and inventors" (Chapter 17).

In Tunisia, there has been greater academic freedom in the past year and scientists have been developing closer international ties. Libya, on the other hand, is confronted with a militant insurgency, offering little hope of a rapid revival of science and technology. Syria is in the throes of a civil war. Porous political borders resulting from the political upheaval of the Arab Spring have, meanwhile, allowed opportunistic terrorist groups to prosper. These hyper-violent militias not only pose a threat to political stability, they also undermine national aspirations towards a knowledge economy, for they are inherently hostile to enlightenment, in general, and the education of girls and women, in particular. The tentacles of this obscurantism now stretch as far south as Nigeria and Kenya (Chapters 18 and 19).

Meanwhile, countries emerging from armed conflict are modernizing infrastructure (railways, ports, etc) and fostering industrial development, environmental sustainability and education to facilitate national reconciliation and revive the economy, as in Côte d'Ivoire and Sri Lanka (Chapters 18 and 21).

The nuclear deal concluded in 2015 could be a turning point for science in Iran but, as Chapter 15 observes, international sanctions have already incited the regime to accelerate the transition to a knowledge economy, in order to compensate for lost oil revenue and international isolation by developing local products and processes. The flow of revenue from the lifting of sanctions should give the government an opportunity to boost investment in R&D, which accounted for just 0.31% of GDP in 2010.

Meanwhile, the Association of South East Asian Nations (ASEAN) intends to transform this vast region into a common market and production base with the creation of the ASEAN Economic Community by the end of 2015. The planned removal of restrictions to the cross-border movement of people and services is expected to spur co-operation in science and technology and thereby reinforce the emerging Asia-Pacific knowledge hub. The greater mobility of skilled personnel should be a boon for the region and enhance the role of the ASEAN University Network, which already counts 30 members. As part of the negotiating process for the ASEAN Economic Community, each member state may express its preference for a specific research focus. The Laotian government, for instance, hopes to prioritize agriculture and renewable energy (Chapter 27).

In sub-Saharan Africa, too, regional economic communities are playing a growing role in the region's scientific integration, as the continent prepares the groundwork for its own African Economic Community by 2028. Both the Economic Community of West African States and the Southern African Development Community (SADC) have adopted regional strategies for STI in recent years that
It is worth noting that several oil-rent economies expressed interest in developing renewable energy before global oil prices began falling in mid-2014, including Algeria, Gabon, the United Arab Emirates and Saudi Arabia. The UNESCO Science Report 2010 had observed a paradigm shift towards green growth. It is evident from the current report that this trend has since accelerated and is seducing an ever-greater number of countries, even if levels of public investment may not always be commensurate with ambitions.

The emphasis is often on developing coping strategies to protect agriculture, reduce disaster risk and/or diversify the national energy mix, in order to ensure long-term food, water and energy security. Countries are also becoming increasingly aware of the value of their natural capital, as illustrated by the recommendation in the Gabon Declaration on Sustainability (2012) for African countries to integrate the value of natural capital into national accounting and corporate planning. Among high-income economies (EU, Republic of Korea, Japan, etc), a firm commitment to sustainable development is often coupled with the desire to maintain competitiveness in global markets that are increasingly leaning towards green technologies: global investment in renewable energy technologies increased by 16% in 2014, triggered by an 80% decrease in the manufacturing costs of solar energy systems. It is to be expected that the trend towards green growth will accentuate, as countries strive to implement the new Sustainable Development Goals.

Looking ahead: Agenda 2030

On 25 September 2015, the United Nations adopted the 2030 Agenda for Sustainable Development. This ambitious new phase transitions from the Millennium Development Goals (2000–2015) to a new set of integrated Sustainable Development Goals (2015–2030). The new agenda is universal and, thus, applies to developing and developed countries alike. It comprises no fewer than 17 goals and 169 targets. Progress towards these goals over the next 15 years will need to be informed by evidence, which is why a series of indicators will be identified by March 2016 to help countries monitor their progress towards each target. The goals balance the three economic, environmental and social pillars of sustainable development, while embracing other pillars of the United Nations’ mission related to human rights, peace and security. STI is woven into the fabric of Agenda 2030, since it will be essential for achieving many of these goals.

Although the Sustainable Development Goals have been adopted by governments, it is evident that they will only be reached if all stakeholder groups take ownership of them. The scientific community is already on board. As we have seen from the UNESCO Science Report: towards 2030, the focus of scientific discovery has shifted towards problem-solving, in order to tackle pressing developmental challenges.

This shift in research priorities is evident in the amount of research funds currently being allocated to applied science. In parallel, both governments and businesses are increasingly investing in the development of ‘green technologies’ and ‘green cities’. At the same time, we should not forget that ‘basic science and applied science are two sides of the same coin’, as recalled by the Scientific Advisory Board to the Secretary General of the United Nations. They are ‘interconnected and interdependent’ (and, thus, complement each in providing innovative solutions to the challenges humanity faces on the pathway to sustainable development.’ An adequate investment in both basic sciences and applied research and development will be critical to reaching the goals of Agenda 2030.

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