

Advancing toward a sustainable future with nuclear science and technology

By Yukiya Amano, Director General, IAEA

Breakthroughs in computing, engineering and physics in recent decades have greatly increased the contribution of nuclear science and technology in areas as diverse as health care, energy and environmental protection. The growing versatility of nuclear applications is helping countries to tackle a host of existing and emerging challenges.

With its Atoms for Peace and Development mandate, the IAEA helps countries to take full advantage of nuclear science and technology to improve the lives of their people and care for the environment. The Agency is uniquely equipped to assist countries in building their capacity, knowledge and expertise, as well as in tapping into the latest developments in nuclear applications. The IAEA Ministerial Conference on Nuclear Science and Technology: Addressing Current and Emerging Development Challenges in November 2018 is part of our continuing efforts to bring together leading thinkers and decision-makers to assess the state of play today and consider what the future might bring.

In this edition of the *IAEA Bulletin*, you can gain an insight into some of the innovative ways in which nuclear science and technology are being used throughout the world.

Learn how the latest developments in radiotherapy are making cancer treatment more effective, safer and gentler on patients than ever before (page 4). Discover the ways in which isotopic techniques reveal valuable nutrition information to help counteract the rise in unhealthy lifestyles often associated with growing prosperity (page 6). Other isotopic techniques are helping farmers to optimize fertilizer use to boost food production for the world's growing population

and to reduce the negative impact of fertilizer as an environmental contaminant and source of greenhouse gas emissions (page 11).

Many countries have turned to nuclear science to help them monitor, mitigate and adapt to climate change, widely seen as the biggest environmental challenge of our time. Experts at the IAEA's 2018 Scientific Forum agreed that solutions to the problems of climate change must include nuclear technology (page 17). This technology has also shed light on what is sometimes called 'the other CO₂ problem' — ocean acidification — and helped scientists to find ways to combat its effects on the oceans and on the livelihoods of coastal communities (page 14).

The impact of nuclear techniques has grown significantly over the years. They are being used in new and diverse fields, from space exploration to conserving valuable works of art and historical artefacts (page 9). To maintain this positive momentum, there is a need to educate and train new generations of nuclear specialists and ensure that knowledge is shared across disciplines. Our story of a young chemist in the Philippines illustrates how empowering a non-nuclear specialist to use nuclear techniques can bridge scientific gaps and break new ground in research (page 19). Countries increasingly recognize the need to increase the proportion of women working in nuclear sciences in order to ensure that we make the most of all the brightest minds in the world (page 21).

The IAEA is committed to supporting all countries in the peaceful use of nuclear applications in order to derive maximum benefit for their people.



"The IAEA helps countries to take full advantage of nuclear science and technology to improve the lives of their people and care for the environment."

—Yukiya Amano,
Director General, IAEA



(Photos: C. Brady/IAEA)

