ATOMS FOR PEACE AND DEVELOPMENT

How the IAEA supports the Sustainable Development Goals

IAEA

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The IAEA makes peaceful nuclear technology available to its Member States in many fields including energy, human health, food production, water management and environmental protection — all important areas recognized under the Sustainable Development Goals (SDGs).

This is why I particularly welcome the adoption of the SDGs. I am especially pleased that explicit recognition has been given to the importance of science and technology for development.

Through its technical cooperation programme, the IAEA transfers nuclear technology to developing countries to help them achieve their development objectives. I expect this work to intensify in light of the SDGs, helping to bring the world closer to achieving the targets.

While our work touches on most of the SDGs, in this brochure we have focused on areas where nuclear and isotopic techniques make a direct contribution either to the achievement of the targets, or to tracking progress by providing data and thus facilitating decision making.

Development is an extremely important part of our work. The impact of our technical cooperation programme in the daily lives of millions of people around the world is extraordinary.

For example, we enable farmers to grow more abundant crops of rice and barley that thrive in difficult conditions. We help countries to monitor and respond to marine pollution that threatens the livelihood of fishermen. And we assist countries in providing life-saving access to radiotherapy for cancer patients.

The IAEA's 167 Member States set their own development goals and decide in which areas they would like our assistance. Our approach focuses on capacity building and empowerment. We help countries to master peaceful nuclear techniques and use them effectively for their own benefit, and that of other countries.

I look forward to continuing to work with our Member States and assisting them in the achievement of the SDGs.

— *Yukiya Amano, Director General, IAEA*

End hunger, achieve food security and improved nutrition and promote sustainable agriculture

Hunger and malnutrition are often rooted in food insecurity and agricultural challenges, causing well-being to suffer and economies to grow strained. Through the IAEA, and its partnership with the Food and Agriculture Organization of the United Nations (FAO), several countries around the world are improving food security and agriculture by using nuclear and isotopic techniques to protect plants from insect pests and to breed new plant varieties that show improved crop yields, disease resistance and/or drought tolerance. Others use these techniques to protect the health of their livestock and enhance reproduction. For example, the IAEA assists countries like Senegal in eradicating tsetse flies, which used to decimate livestock, with the sterile insect technique.

As foodstuffs are prepared for consumption, irradiation helps to ensure quality and safety. With IAEA assistance, some countries use irradiation to eliminate potentially harmful bacteria and unwanted insect pests, while others benefit from their use in extending food shelf life.

Food insecurity and agricultural challenges often lead to hunger and malnutrition. Using stable isotope techniques, health professionals can monitor body composition and food intake and absorption to better understand the complexities of malnutrition and whether treatment and prevention measures are effective.

(Photo: IAEA)

"We hope our success with eradicating tsetse flies in the Niayes area continues and can be a source of scientific solutions and inspiration for Senegal and other African countries to achieve their sustainable development goals."

— Baba M. Sall, Senegal's Directorate of Veterinary Services

Ensure healthy lives and promote well-being for all at all ages

Achieving sustainable development is not possible if health suffers due to debilitating diseases and health conditions. To help achieve the target of reducing deaths from non-communicable diseases by one third, the IAEA is well-positioned to assist countries in tackling cancer by helping them to devise comprehensive cancer control programmes, establishing nuclear medicine, radiation oncology and radiology facilities, as well as supporting education and training for specialized health professionals.

The IAEA also works to improve the utilization and reliability of facilities, including research reactors, that produce life-saving radioisotopes and to support countries in limiting patients' overexposure to radiation during medical procedures. The Agency's work contributes to improved cancer management and access to care worldwide.

With greater access to radiation and nuclear medicine technologies, countries are also able to more precisely diagnose and manage diseases, like cardiovascular disease, as well as monitor and evaluate health conditions, such as tuberculosis and other infections.

With the help of nuclear techniques, for example, scientists and health workers in Guatemala are now able to identify the causes and consequences of malnutrition in the country's children, enabling policymakers to devise strategies to combat obesity and stunting. The IAEA also supports countries in developing capabilities for the early detection of diseases that spread from animals to humans, such as Ebola.

(Photo: CIIPEC)

"Nuclear science and technology gave us the tools to understand and associate body composition with physiological changes, which can help to prevent disease later in life."

— Manuel Ramirez, Coordinator, Research Centre for the Prevention of Chronic Diseases, Institute of Nutrition of Central America and Panama (INCAP), Guatemala

Ensure availability and sustainable management of water and sanitation for all

Water is essential to life. As populations grow and economies expand, access to clean and safe water is imperative. Isotopic techniques shed light on the age and quality of water. Some countries, such as Brazil, use this to implement integrated water resource management plans to sustainably use resources and to protect water and water-related ecosystems, while others use the data to address scarcity and improve freshwater supplies.

The IAEA's work includes helping farmers in Africa to use their scarce water resources efficiently through nuclear and isotopic techniques, establishing isotope laboratories in the Middle East for studying groundwater resources, and assisting in the development of water use and management policies in the Sahel region.

As society leaves its mark, water pollution is also a challenge. With IAEA support, some countries are now turning to radiation technology to treat industrial wastewater, reducing contaminants and improving water quality, making water safer for reuse.

(Photo: IUCNweb/flickr.com/CC BY 2.0)

"Water is a key bottleneck for the economic development of our country. We need to find a reliable supply of fresh water for the dry season."

— Mohamed Matthew Blango, Researcher, Njala University, Sierra Leone

7 AFFORDABLE AND CLEAN ENERGY

Ensure access to affordable, reliable, sustainable and modern energy for all

Access to clean, reliable and affordable energy is a precondition for sustainable economic growth and improved human well-being, affecting health, education and job opportunities. The IAEA fosters the efficient and safe use of nuclear power by supporting existing and new nuclear programmes around the world, catalyzing innovation and building capacity in energy planning, analysis, and in nuclear information and knowledge management. The IAEA helps countries meet growing energy demand for development, while improving energy security, reducing environmental and health impacts, and mitigating climate change.

The IAEA supports countries considering and planning the introduction or expansion of their nuclear power generation capacities, assisting and guiding them through all stages of the process towards the safe and secure use of nuclear power.

"We need affordable, reliable, competitive and safe electricity. At the Third IAEA Regional Conference on Energy and Nuclear Power in Africa 35 African Member States discussed the need to undertake sustainable energy planning, and many expressed an interest in nuclear power."

— Ochilo Ayacko, Executive Chairman of the Kenya Nuclear Electricity Board

Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation

Cutting-edge industrial technologies underpin the success of strong economies, in developed and developing countries alike. Nuclear science and technology, in particular, can make a major contribution to economic growth, and have an important role to play in support of sustainable development.

With the IAEA's help, some countries have increased the competitiveness of their industries by using these technologies for non-destructive testing in safety and quality tests, and irradiation techniques for improving product durability, from car tyres to pipelines and medical devices to cables.

Industrial testing using nuclear technology has contributed to the competitiveness of Malaysia's manufacturing sector, for example. The country has built itself a niche in South-East Asia, offering non-destructive testing (NDT) with nuclear devices to manufacturers in neighbouring countries.

Irradiation also improves industrial sustainability by helping to lower environmental impact through treatment of flue gases at coal-fired power plants and through the identification of pollution pathways in the air.

(Photo: A. Nassir Ibrahim/Madani NDT Training Centre)

"The Malaysian example shows that it is possible to build an internationally recognized testing system from scratch."

— Patrick Brisset, industrial technologist, IAEA

Take urgent action to combat climate change and its impacts

Nuclear science, including nuclear power, can play a significant role in both climate change mitigation and adaptation. Nuclear power, along with wind and hydro, is one of the lowest-carbon technologies available to generate electricity. The IAEA works to increase global awareness of the role of nuclear power in relation to climate change, in particular to try to ensure that the role that nuclear power can and does play in assisting countries to reduce their greenhouse gas emissions is properly recognized.

Nuclear power forms an important pillar of many countries' climate change mitigation strategies, and an increasing number of countries are considering nuclear power within their national energy portfolios.

Nuclear science and technology can play a vital role in assisting countries to adapt to the consequences of climate change. Working with the IAEA's support, the use of nuclear techniques has led to better flood control in the Philippines, to the development of new irrigation techniques in increasingly arid regions of Kenya, and to the creation of new wheat seed varieties in Afghanistan that thrive in harsh environmental conditions.

(Photo: FAO/IAEA)

"Picking mutants that fit the climate and using the new varieties are very important for Afghanistan and for farmers' livelihoods. Having plants with good yields and resistance to diseases and that are able to thrive in the changing climate is very important."

— Sekander Hussaini, Head, Chemistry, Biology and Agriculture Research Centre, Academy of Sciences, Afghanistan

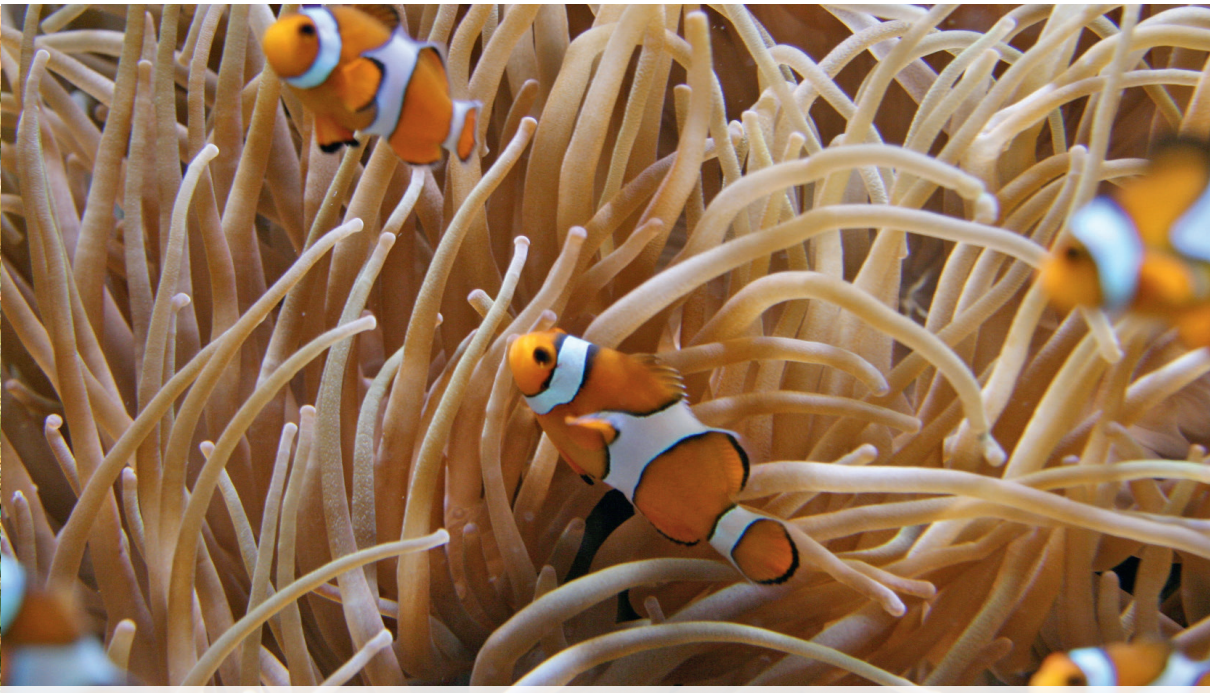
Conserve and sustainably use the oceans, seas and marine resources for sustainable development

Oceans contain vast ecosystems brimming with marine life, and are a vital resource for people that rely on the sea for their livelihood, day-to-day nutrition, or both. To sustainably manage and protect oceans and, in turn, support coastal communities, many countries are using nuclear and isotopic techniques, with support from the IAEA, to better understand and monitor ocean health and marine phenomena like ocean acidification and harmful algal blooms.

The IAEA assists Member States in the use of nuclear techniques to measure ocean acidification, and provides objective information to scientists, economists, and policymakers to make informed decisions.

National, regional and international laboratory networks established through IAEA coordination also offer several countries an avenue for scientific collaboration, and are key resources for analyzing and monitoring marine contaminants and pollutants.

(Photo: M. Madsen/IAEA)



"Radiotracers are unique tools to study pollution and its transport in coasts and oceans. The IAEA and its partners work to make available these nuclear technologies to improve understanding of the health of the oceans, encouraging countries to take practical steps to prevent any further deterioration."

— Catherine Hughes, senior research scientist, Institute for Environmental Research, Australian Nuclear Science and Technology Organisation, Australia

Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

Desertification, land degradation and soil erosion can jeopardize lives and livelihoods. Isotopic techniques provide accurate assessments of soil erosion and help to identify and trace erosion hot spots, providing an important tool to reverse land degradation and restore soils. These include using fallout radionuclides, which help to assess soil erosion rates, and the compound specific stable isotope analysis, used to identify where eroded soil originated. Furthermore, the IAEA is supporting Member States to fulfill their obligations to combat desertification.

The IAEA's support in these areas helps many countries to gather information using these techniques to shape agricultural practices for more sustainable land use. This contributes to higher incomes, while also improving conservation methods and protection of resources, ecosystems and biodiversity.

Farmers in developing countries such as Viet Nam use these tools to identify the source of soil erosion afflicting their plantations, allowing them to save their farms and earn extra income.

(Photo: P. S. Hai, Centre for Environmental Research and Monitoring, Dalat Nuclear Research Institute)

"I no longer worry about the erosion of my land. My income has stabilized and I am determined to offer my children the education I could never get."

— Dao Thanh Canh, farmer, central Viet Nam

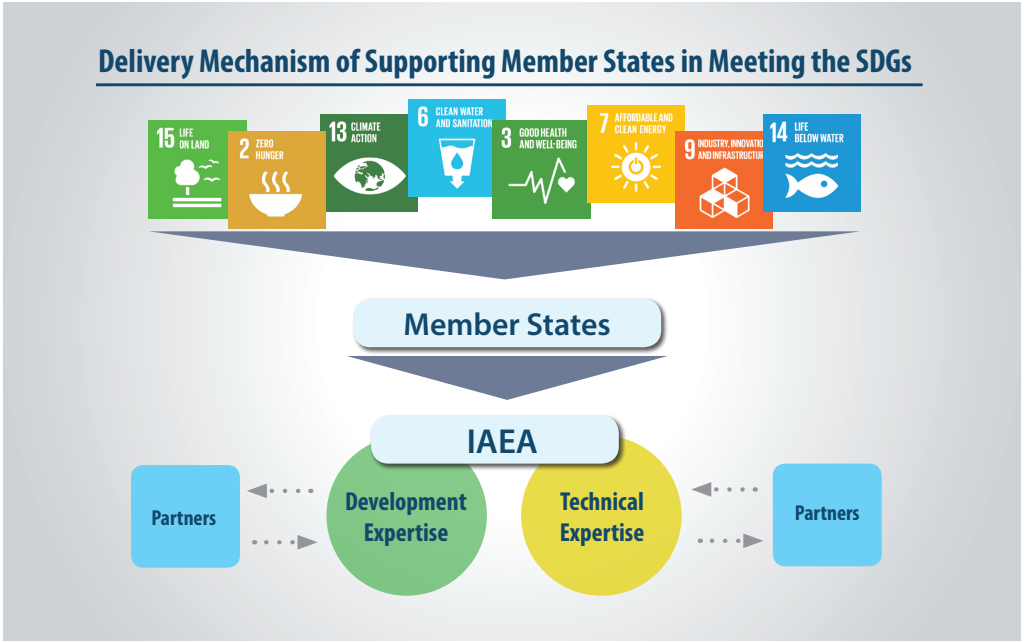
Strengthen the means of implementation and revitalize the global partnership for sustainable development

Partnerships are at the heart of the IAEA's technical cooperation activities. Close collaboration between the IAEA, its Member States, United Nations organizations and other international and civil society organizations helps to maximize the impact of the IAEA's support towards the achievement of development priorities.

In 2014, the IAEA provided support to 131 countries and territories through its technical cooperation programme. With the help of its multi-stakeholder partnerships, including a global network of centres of excellence and IAEA collaborating centres, the IAEA promotes science-based policy making and access to technology and innovation.

To ensure that our assistance is tailored to the specific needs and priorities of our clients and is sustainable in the long term, all IAEA assistance activities are based on consultations with Member States. Over 90 Member States already have in place country programme frameworks that link IAEA support to national development priorities. IAEA technical cooperation integrates results-based management approaches for effective monitoring and management of all projects.

The IAEA has been encouraging Member States to move from smaller, national projects to interventions with larger scope, scale and duration, with potential for more robust, longer-term development impact. IAEA Member States also share their knowledge, technologies and best practices through regional projects. The IAEA promotes and facilitates bilateral, South-South, sub-regional and topical collaboration among countries, regulators and institutions.



The 17 Sustainable Development Goals are a range of objectives agreed on by the United Nations General Assembly on 25 September 2015. They aim at stimulating action over the next 15 years in areas of critical importance for humanity and the planet. They are integrated and indivisible and balance the three dimensions of sustainable development: the economic, social and environmental.

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