



# Nuclear Sciences and Applications



## Securing A Better Future For All **Nuclear Techniques for Global Development and Environmental Protection**

# Nuclear Sciences and Applications Partnerships

## Making A Difference Together

The IAEA has a long history of cooperation with other international organizations, regional agencies, non-governmental organizations (NGOs), local and national governments, research and academic institutions. These cooperative efforts make it possible for the IAEA to implement many of its projects undertaken in the area of nuclear applications for peaceful purposes.

### Conserving the Earth's Oceans

The Intergovernmental Oceanographic Commission of the United Nations Educational, Scientific and Cultural Organization (UNESCO/IOC), the IAEA and the United Nations Environment Programme (UNEP) have pooled their resources to facilitate capacity building in Member States in order to improve their ability to assess, manage and protect marine environments, including oceans, semi-enclosed seas and coastal zones. More specifically, their joint efforts assist Member States to:

- Develop capacities to conduct coastal and marine environmental assessments;
- Improve national and regional capacity to monitor and manage harmful algal events and eutrophication of coastal waters due to nutrient overenrichment;
- Support and promote the Global Partnership on Nutrient Management to address nutrient management challenges;
- Improve capacities to identify sources and sinks of carbon in coastal and oceanic waters and ecosystems;
- Train scientists from Member States in experimental and observational techniques to study ocean acidification, harmful algal blooms and eutrophication and their impacts on coastal and marine biodiversity.

### Promoting Science in the Developing World

The Abdus Salam International Centre for Theoretical Physics (ICTP) in Trieste, Italy, was founded in 1964 under the patronage of the IAEA. Today, it operates under a tripartite agreement between the IAEA, the Italian Government and UNESCO.

The IAEA and ICTP cooperate on many levels and through a large variety of projects. Topics range from materials science and nuclear energy management to computer simulations and plasma physics. The IAEA-ICTP Sandwich Training Educational Programme offers PhD fellowships to candidates from IAEA Member States supported by the IAEA Technical Cooperation Fund. The programme allows students to receive part of their training at the ICTP, at other institutes in the Trieste area, or at the IAEA laboratories in Seibersdorf and Monaco, while remaining enrolled in their home institutes.

For nearly 50 years, the ICTP has been ensuring that scientists from the developing world have access to the same resources and opportunities enjoyed by their wealthier counterparts. The ICTP is a focal point of cooperation between developed and developing countries, and it has been a major force in countering the scientific brain drain from the developing world.

## Alleviating the Cancer Epidemic

Through its Programme of Action for Cancer Therapy, the IAEA has sought to forge partnerships with international organizations, national cancer institutes, NGOs and private companies, in order to fight cancer in the developing world. These partnerships help Member States to develop their national plans for cancer prevention and control and to raise funds to improve conditions and outcomes for cancer patients. As a result, limited resources can be used in the most cost effective way and millions of unnecessary deaths may be prevented. IAEA partnerships also contribute to the global effort to include cancer and other non-communicable diseases within the framework of the Millennium Development Goals.

In light of growing international concern for the global cancer epidemic and its projected increase, in July 2009 the World Health Organization (WHO) and the IAEA launched a Joint Programme on Cancer Control to strengthen and accelerate efforts to fight cancer in the developing world. The WHO's National Cancer Control Programme seeks to address cancer control through a public health approach and within the context of non-communicable diseases. The National Cancer Control Programme includes the equitable implementation of evidence based interventions for prevention, early detection, diagnosis and treatment and palliative care. The IAEA, with its mandate to assist in, and coordinate, the practical application of atomic energy for peaceful uses worldwide, has over 40 years of experience in providing radiation medicine expertise and technology to low and middle income countries. Thus, the WHO-IAEA Joint Programme provides the framework for the two organizations to combine their work, building on their areas of expertise to create a more coordinated and robust approach to combating cancer.



## Building Better Agriculture

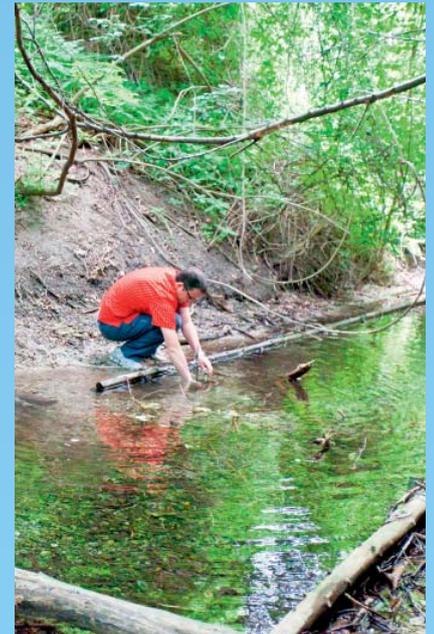
The link between atomic energy and agriculture has proven to be extremely valuable and unique in agricultural research and development. In 1964, the FAO's atomic energy branch and the IAEA's agriculture unit came together to become the Joint FAO-IAEA Division of Nuclear Techniques in Food and Agriculture. Since then, the Joint Division has made critical contributions to global efforts to combat hunger and attain food security.

It operates with a staff of 100 scientists, technical experts and support personnel divided between offices and laboratories. It oversees an annual budget of approximately US \$17.5 million, plus an additional US \$10–14 million in technical cooperation projects, all geared to helping Member States solve practical agricultural problems with nuclear technology. Its research and development activities are broken into five separate but interrelated work areas: soil and water management and crop nutrition, plant breeding and genetics, animal production and health, insect pest control, and food and environmental protection.

The Joint Division fosters extensive cooperation and networking with national and international institutions and organizations. Its potential to secure extrabudgetary contributions is exemplified by current research and development projects funded by external partners, including the EU, UNFIP, UNTFS, USAID, USDA and the Wellcome Foundation.

## Managing Water Resources

The IAEA currently works with UNESCO on the Joint International Isotopes in Hydrology Programme, launched to foster cooperation between hydrologists and isotope professionals at the national level. It also cooperates with other United Nations, international and national organizations to facilitate programmes and technology transfer, and is an active member of the United Nations interagency group, UN Water.



The Global Network of Isotopes in Precipitation, undertaken in collaboration with the World Meteorological Organization, has been in existence since 1961. The IAEA's Isotope Hydrology Laboratory works together with partner laboratories to provide access to laboratory services for analysis, for quality assurance and in support of global isotope databases.

Another example of a successful joint programme is the Global Environment Facility/World Bank/IAEA partnership on the Nubian Sandstone Aquifer system. An essential first step in developing management strategies for the system has been to understand both the transboundary and local effects of recovering water from the aquifer now and in the future. This has been achieved through the creation of an IAEA model, which relied extensively on collaborative efforts between organizations and the countries themselves.