



## Key achievements in Oman

- 2017: Enhanced detection and screening capabilities decrease rates of malaria by 95 per cent across the country.
- 2017: A laboratory is established at the Marine Science and Fisheries Centre in Muscat which uses nuclear techniques to identify the presence of toxins and monitors and addresses their effects on the marine ecosystem.

## Atoms for peace and development

Widely known as the world's 'Atoms for Peace and Development' organization within the United Nations family, the IAEA is the international centre for cooperation in the nuclear field. The Agency works with its Member States and multiple partners worldwide to promote the safe, secure and peaceful use of nuclear technologies.

The IAEA's technical cooperation (TC) programme helps countries to use nuclear science and technology to address key development priorities in areas including health, agriculture, water, the environment and industry. The programme also helps countries to identify and meet future energy needs. It supports greater radiation safety and nuclear security, and provides legislative assistance.



## Recent project successes

### Human health

The once major problem of malaria in Oman has been significantly curtailed in the last two decades due to the use of nuclear detection techniques. The more usual methods of detection, such as microscopy, have not been effective in identifying most of the existing malaria cases.

The IAEA, in collaboration with the Biochemistry Department of the College of Medicine and Health Sciences of Sultan Qaboos University and the Central Health Laboratory of the Ministry of Health in Muscat, have introduced a radionuclide-based molecular method and DNA sequencing technique to detect malaria parasites.

With this long term enhanced capacity and the ability to screen possible carriers, the number of diagnosed cases has reduced from over 500 a year in the first decade of the project, to less than 25 annually in the last 10 years.

### Environmental monitoring

The rapid increase and accumulation of algae on Oman's coasts pose a serious threat to the marine ecosystem and the local fishing industry. In 2014, algal blooms even led to human fatalities when harmful toxins were found in contaminated fish for sale at the local markets.

Through a series of projects, the IAEA worked with Oman to develop a reference laboratory at the Marine Science and Fisheries Centre of the Ministry of Agriculture and Fisheries (renamed to Ministry of Agriculture, Fisheries and Water Resources in 2020) in Muscat, to monitor the presence of biotoxins and algae. This included the introduction of a nuclear technique which uses a biochemical substance – or 'radioligand' – to identify the presence of toxins, and the development of a geographic information system to map the locations of the algal blooms and share the data with the fishing community.

With IAEA assistance, technical staff at the laboratory of the Biochemistry Department, College of Medicine and Health Sciences, Sultan Qaboos University, are now able to perform quantitative polymerase chain reactions to detect genes associated with drug resistance in the malaria parasite *Plasmodium vivax*. (Photo: Sultan Qaboos University)

## Active national projects

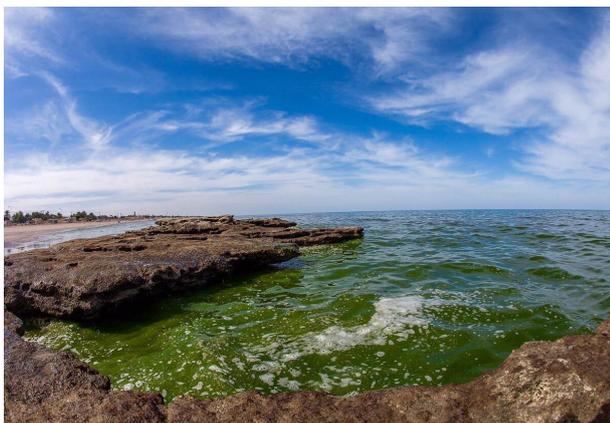
- Using Isotopes and Nuclear Techniques in Integrated Water, Soil and Nutrients Management to Optimize Crop Productivity (OMA5006)
- Strengthening Sterile Insect Technique Based Area-Wide Integrated Management of Date Palm Pests (OMA5007)
- Enhancing National Capabilities in Food Safety and Traceability (OMA5008)
- Enhancing Quality Management Systems for Positron Emission Tomography–Computed Tomography Centers and a Cyclotron Facility (OMA6008)
- Assessing and Monitoring Radioactive and Non-Radioactive Pollutants in the Marine Environment and Coastal Zones (OMA7004)
- Strengthening the Radiation Safety Infrastructure and its Supportive Technical Capabilities (OMA9005)
- Implementing Safe Management for Radioactive Waste and Naturally Occurring Radioactive Materials from the Oil and Gas Industries (OMA9006)

Oman also participates in 34 regional and 2 interregional projects, mostly in the area of health and nutrition.

## Previous IAEA support to Oman

In recent years, support has mainly focused on the areas of human health, and food and agriculture. The IAEA trained staff and provided quality control measures to upgrade Oman's diagnostic, radiotherapy, medical physics and radiobiology capacities.

Further attention was placed on strengthening regulations and the radiation safety infrastructure to ensure the protection of workers, patients, the public and the environment. The IAEA also helped improve the productivity of major crops in the country through mutation and breeding, the management of nutrients and the eradication of pests, such as palm insects, through the use of the sterile insect technique.



## IAEA support to Oman, 2009–2019



**336** trained  
(including 132 women)

**144** international experts provided

**49** attended specialist meetings  
(including 17 women)

## Priority areas of support

- Improving the food and agriculture sector
- Strengthening human health
- Supporting the management of water resources
- Protecting the environment
- Strengthening the national legal and regulatory framework
- Supporting radiation safety and nuclear security infrastructure

## Oman's contribution to South-South and triangular cooperation, 2009–2019

**7** expert and lecturer assignments provided by Oman

**28** training course participants

**6** fellows or scientific visitors hosted

Based on data available as of April 2020

## Cancer control iMFACT Review conducted: January 2013

## Strategic documents supported

- Country Programme Framework 2018–2023, signed in September 2016

IAEA support helped Oman to establish capacity for the effective management of algal blooms that are harmful to the marine environment. The country is now better able to understand the causes of harmful algal blooms, predict occurrences and mitigate their effects on public health, food safety and the environment.  
(Photo: M. al Marzouqi/Marine Science and Fisheries Centre)

[www.iaea.org/technicalcooperation](http://www.iaea.org/technicalcooperation)

The IAEA collaborates with National Liaison Officers and Permanent Missions to deliver its TC programme.