

# Management of Technical Cooperation for Development

## Objective

To develop and implement a need-based, responsive technical cooperation programme in an effective and efficient manner, and thus to strengthen technical capacities of Member States in the peaceful application and safe use of nuclear technologies for sustainable development.

## The Technical Cooperation Programme

### Programme delivery

The technical cooperation programme is the Agency's major vehicle for transferring nuclear technology and building capacity in nuclear applications in Member States. It supports national efforts to achieve development priorities, including targets underpinning the Sustainable Development Goals (SDGs), and encourages cooperation between Member States and with partners.

The main areas of technical cooperation in 2020 were nuclear knowledge development and management, health and nutrition, and food and agriculture (Fig. 1).

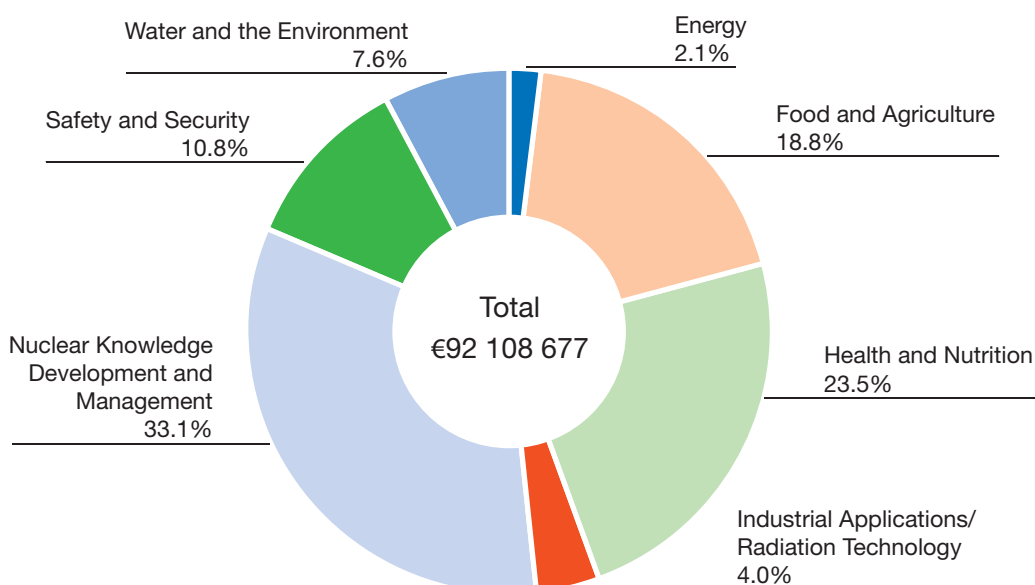


FIG. 1. Technical cooperation programme disbursements (actuals) by technical field for 2020. (Percentages do not add up to 100% owing to rounding.)

## Financial highlights

Payments to the 2020 Technical Cooperation Fund totalled €84.5 million (including National Participation Costs and miscellaneous income; no assessed programme cost arrears were received in 2020), against the target of €88.1 million. The rate of attainment on payments at the end of 2020 was 91.1% (Fig. 2). The Technical Cooperation Fund implementation rate was 80.4%.

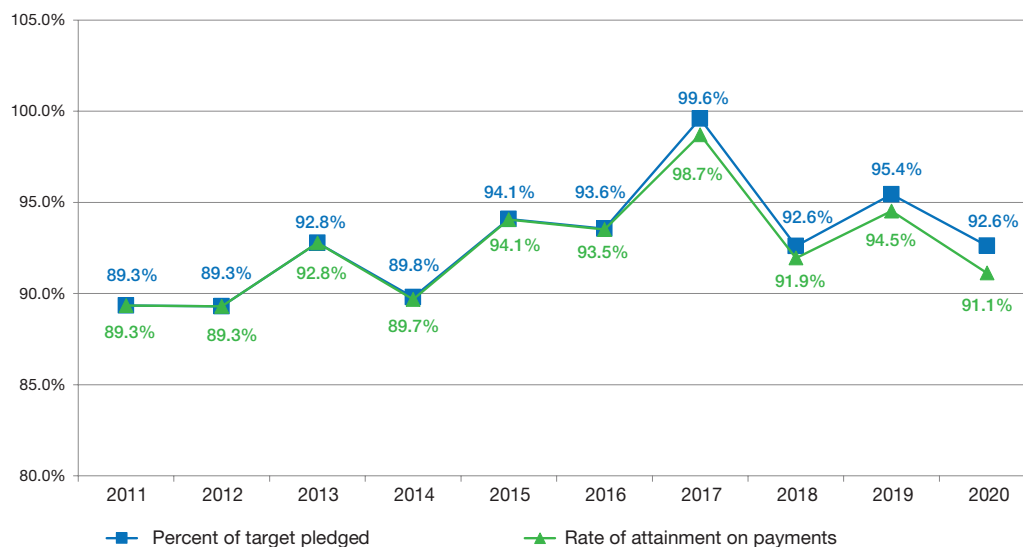


FIG. 2. Trends in the rate of attainment, 2011–2020.

## Country Programme Frameworks and Revised Supplementary Agreements

The number of valid Country Programme Frameworks (CPFs) stood at 113 at the end of 2020.

The total number of Revised Supplementary Agreements Concerning the Provision of Technical Assistance by the International Atomic Energy Agency (RSAs) was 141.

### CPFs signed in 2020

Chad	Indonesia	Mauritania	Republic of
Chile	Lao People's	Mauritius	Moldova
Croatia	Democratic	Panama	Sudan
Georgia	Republic		Togo

## Regional Cooperative Agreements and Regional Programming

### Africa

The programme of the African Regional Co-operative Agreement for Research, Development and Training Related to Nuclear Science and Technology (AFRA) contributes significantly to training a new generation of African scientists who will foster nuclear science and technology for African development. In 2020, for example, ten candidates pursued master's degrees in nuclear science and technology at Alexandria University (Egypt) and the University of Ghana through the two year AFRA master's programme

in nuclear science and technology, while seven regional training courses and 16 meetings were conducted within the framework of AFRA projects.

AFRA State Parties conducted a mid-term review of the AFRA Regional Strategic Cooperative Framework for 2019–2023, considering emerging priority areas such as climate change adaptation, sustainable energy development and human nutrition. These areas will be addressed in the 2022–2023 AFRA programme.

### *Asia and the Pacific*

Following publication of the socioeconomic impact assessment of its mutation breeding programme, the Regional Cooperative Agreement for Research, Development and Training Related to Nuclear Science and Technology for Asia and the Pacific (RCA) initiated a socioeconomic impact assessment of the RCA radiotherapy and industrial application programmes. Development of the RCA Medium Term Strategy 2024–2029 and the regional programming framework began, and preparations for the commemoration of RCA's 50th anniversary, to be held in Hanoi, got under way.

The Co-operative Agreement for Arab States in Asia for Research, Development and Training related to Nuclear Science and Technology (ARASIA) named five new resource centres in secondary standards dosimetry, expanding the ARASIA resource centres in human health and enhancing access across the region to science and technology for development.



FIG. 3. The Agency dispatched equipment to countries around the world to enable them to use real-time reverse transcription–polymerase chain reaction, a nuclear derived technique, to rapidly detect the coronavirus that causes COVID-19. Here, equipment donated by the Agency is delivered to the Nuclear Medicine School Foundation (FUESMEN) in Mendoza, Argentina. (Photograph courtesy of FUESMEN.)

## *Europe*

The technical cooperation programme continued to strengthen human resources and institutional capacity in countries in Europe and Central Asia in 2020, in line with CPFs, the Europe Regional Profile 2018–2021 and the Strategic Framework for the Technical Cooperation Programme in the Europe Region 2019–2025. Consultation with traditional donors in the region on expanding partnerships continued, including hosting of technical cooperation events and financial contributions. Participation in the Global Mountain Sustainability Forum 2020 and in a conference organized by the International Water Resources Association enabled outreach on Agency work on climate change in high mountain areas and on enhancing capacity for isotope based assessment of water resources in the context of adapting to climate change.

To further strengthen collaborative efforts to implement technical cooperation projects during the pandemic, five interactive webinars (delivered in English and Russian) were held for Member States in Europe and Central Asia to give a comprehensive overview of technical cooperation projects. The webinars also highlighted the roles and responsibilities of the Secretariat and technical cooperation stakeholders in Member States.

At a virtual meeting with representatives and National Liaison Officers from Member States in Europe and Central Asia on the margins of the 64th regular session of the General Conference, participants were given an overview of the implementation of the 2020–2021 technical cooperation programme, and of regional project proposals under development for the 2022–2023 cycle. It was agreed that the Europe Regional Profile 2018–2021 would be reviewed and updated.

## *Latin America and the Caribbean*

The Regional Strategic Profile of the Regional Co-operation Agreement for the Promotion of Nuclear Science and Technology in Latin America and the Caribbean (ARCAL), 'Agenda ARCAL 2030', was finalized in 2020. Designed to align closely with the SDG targets, the document establishes common needs and priorities in the region that can be addressed using nuclear applications and will guide the development and implementation of regional projects for the coming decade.

Cooperative actions under the 2020–2026 Regional Strategic Framework for technical cooperation with Caribbean Community member countries began in the fields of radiation safety, marine environment, food safety and radiation medicine.

## **Programme of Action for Cancer Therapy (PACT)**

Six imPACT (integrated missions of PACT) Review missions were initiated, with three completed (Central African Republic, Mali and Senegal), using a virtual modality. Thirteen Member States received support in reviewing their progress in implementing cancer control efforts and imPACT Review recommendations through the PACT partnership. Targeted outreach to traditional and non-traditional donors was conducted to mobilize direct and indirect resources for unfunded cancer related activities in Member States, totalling nearly €1 million. Over thirty virtual briefing sessions were held with donor countries and others to present opportunities for contributions to the Agency's cancer related efforts.

Burkina Faso, the Islamic Republic of Iran, Lebanon, Nigeria and Sri Lanka received support in cancer control assessment and planning, and Bangladesh, Chad, Mozambique, Sierra Leone and Uzbekistan received support in developing bankable documents.

Key partners in cancer control, including representatives of the International Agency for Research on Cancer and the World Health Organization, met with the Agency to strengthen the planning and delivery of joint activities and improve country level coordination.



Collaboration with the City Cancer Challenge foundation and the Union for International Cancer Control was strengthened in the areas of impACT Reviews and national cancer planning.

## Strengthening the Quality of the Technical Cooperation Programme

Guidelines for the Planning and Design of the IAEA 2022–2023 Technical Cooperation Programme were issued in January. The TC Programme Quality Criteria — the foundations of the results based management of the technical cooperation programme — were updated.

The technical cooperation project report processing system platform now includes a cumulative reporting towards target feature. This facilitates evidence based tracking of progress and allows for aggregated portfolio reporting at the outcome and output level. The submission rate of Project Progress Assessment Reports for the 2019 reporting period was 71%.

Training materials on the results based management of the technical cooperation programme were made available on the Programme Cycle Management Framework IT platform, covering the technical cooperation project document template, the logical framework approach (in English and Spanish) and the technical cooperation project workplan and budget. The new on-line tutorial on using the logical framework approach had more than 2300 views by the end of 2020.

## Outreach and Communication

A new information product — a series of country overviews — was launched and is being made available on-line. The Agency's COVID-19 assistance was covered extensively in outreach efforts. In December, the Agency was profiled as Partner of the Month on the South–South Galaxy platform of the United Nations Office for South–South Cooperation.

The annual seminar on technical cooperation for the Vienna diplomatic corps attracted 100 participants.

The Agency supported the establishment of the Women in Nuclear (WiN) regional chapter in Africa (WiN Africa), and ARCAL and the Agency launched a project to support the establishment of a new regional WiN chapter in Latin America and the Caribbean. National WiN chapters were established with Agency support in Africa (Ghana, Lesotho, Nigeria and Tunisia) and in Latin America (Chile, Ecuador and Peru).

### Technical Cooperation outreach in 2020

**145+** IAEA web articles on technical cooperation

**6441** @IAEATC Twitter followers (17% increase),  
**over 322** @IAEATC tweets

**1882** @iaeapact Twitter followers (36% increase),  
**286** tweets (since June)

**1686** LinkedIn TC Alumni Group members

## Cooperation with the United Nations System

The Agency participated in the preparation of the annual Financing for Sustainable Development Report, a joint product of the Inter-Agency Task Force on Financing for Development. The 2020 Report highlighted results obtained via the use of the sterile insect technique (SIT) — an environmentally friendly method of pest control — in animal and human health, and in food production and trade.

Practical Arrangements were signed with the United Nations Industrial Development Organization allowing common Member States increased access to nuclear science and technology to support their sustainable industrial development efforts. The Arrangements address agricultural value chains for increased food security, better management of environmental stressors such as plastics, and energy planning tools and services.

The Agency signed a Memorandum of Understanding with the Joint United Nations Programme on HIV/AIDS (UNAIDS) to tackle cervical cancer in HIV-positive women in low and middle income countries.

## Partnership Agreements and Practical Arrangements

The Agency concluded 12 new and extended 2 existing partnerships related to technical cooperation, focused mainly on expanding collaboration with various partners for the achievement of the SDGs and on tackling the COVID-19 pandemic.

Takeda pharmaceutical company committed to donating 500 million yen (around €4.1 million) to support the Agency's global initiative to help countries combat the COVID-19 pandemic.

The new partnership between the Agency and the Global Access to Cancer Care Foundation focuses on oncology training in low and middle income countries to tackle the shortage of cancer care professionals. Practical Arrangements with the Union for International Cancer Control were also concluded, to enhance the quality of and access to radiation medicine services.

The Agency and the Sovereign Military Order of Malta signed Practical Arrangements to collaborate on outreach and resource mobilization for Agency activities in nuclear medicine, radiation medicine, radiation oncology, radiotherapy and palliative care.

Practical Arrangements between the Agency and the French Society of Nuclear Medicine were signed, providing a framework for enhanced collaboration on capacity building in the areas of nuclear medicine, molecular imaging and allied disciplines, particularly for professionals from French speaking countries.

### *Activities and actions under existing agreements*

The 9th project review meeting between the Agency and the European Union under the 2016 Delegation Agreement reviewed the implementation of the Agency's six ongoing European Union funded projects, three of which are technical cooperation projects. Implementation of the 2019 Delegation Agreement began.

The Agency presented the uses of nuclear science and technology in Africa at the African Union Commission meeting for ministers in charge of science, technology and innovation. The Agency continued to support the African Union's Pan African Tsetse and Trypanosomosis Eradication Campaign, with virtual platforms used to maintain the network of participating countries.

Under the Practical Arrangements signed with the Association of Southeast Asian Nations in 2019, cooperative activities continued under an existing regional project on emergency preparedness and response. In 2020, the Agency strengthened existing collaboration with the European Society for Radiotherapy and Oncology and Inholland Academy. A total of

111 medical practitioners (61% female) participated in virtual training courses offered by the two organizations in areas including brachytherapy, image guided radiotherapy and volumetric modulated arc therapy.

The Practical Arrangements with the University of the West Indies at Mona, Jamaica, focus on training professionals in medical radiation physics and radiation safety. In 2020, the University collaborated with national stakeholders to develop an action plan for the formulation of a national education and training strategy in radiation safety.

The Agency continued its collaboration with the Latin American Network for Education in Nuclear Technology (LANENT) and the Spanish Nuclear Industry Forum on implementation of the 'NUCLEANDO' project, which supports STEM (science, technology, engineering and mathematics) education by promoting nuclear science to high school students in the region, offering a series of interactive materials.

The Women's Cancers Partnership Initiative with the Islamic Development Bank (IsDB) advanced, with 17 countries preparing funding proposals for support to address women's cancers. The Agency and IsDB jointly held several events to mobilize additional resources for the Initiative.

## Legislative Assistance

The Agency continued to provide legislative assistance to Member States through workshops, missions and meetings to raise awareness, advise and train on developing and revising national legislation and adhering to and implementing the relevant international legal instruments. Twelve Member States received country specific bilateral legislative assistance through written comments and advice on drafting national nuclear legislation. As an on-line alternative to some in-person activities, four virtual activities on different aspects of nuclear law were held for Bahrain, Costa Rica, Turkmenistan and Viet Nam. Further, one regional workshop on harmonizing national nuclear law with international and European law was held in person. Belize, Djibouti, Nepal and Togo enacted nuclear legislation, having benefitted from bilateral legislative drafting assistance from the Agency.

Owing to COVID-19 related restrictions, the 2020 session of the annual Nuclear Law Institute (NLI) interregional training event had to be postponed until 2021. A video celebrating the tenth anniversary of the NLI was launched on the margins of the 64th regular session of the General Conference. The video highlighted the impact of the NLI programme over the past decade in helping Member States to acquire a solid understanding of nuclear law and to develop the necessary skills to draft, amend and review national nuclear legislation.

A new series of interactive webinars on nuclear law amassed over 2500 streams, with participation from officials from over 100 countries. Given the success of this series and in response to expressed interest from industry, law firms, non-governmental organizations, civil society and academia, a webinar was held for the general public entitled 'Nuclear Law in Practice: The IAEA Perspective'.

## Treaty Event

The annual Treaty Event took place during the 64th regular session of the General Conference, providing Member States with an additional opportunity to deposit their instruments of ratification, acceptance, or approval of, or of accession to, the multilateral treaties deposited with the Director General. The event focused on the multilateral treaties relating to nuclear safety and security and to civil liability for nuclear damage.



## CASE STUDY

## Nuclear Techniques Help Madagascar Villagers Access Clean Drinking Water

Amid the penetrating smells of rotting and burning garbage, constantly chased by thousands of flies, live the 4000 residents of Ambaniala, a village built right on the edge of the Andralanitra municipal waste site of Antananarivo, Madagascar's capital. But — thanks to the use of nuclear and isotopic techniques — at least the villagers now know which wells in the settlement can be used for getting drinking water and which are contaminated from effluent from the adjacent open air landfill, which provides their livelihood.

"It is much easier now, and nobody gets sick," said Josiane Ranoroosa, a member of the village council. "Some of us need to walk farther for water, but it is at least drinkable." A few of the wells in the contaminated area are used to draw water for washing and cleaning, she added.

Madagascar is one of the countries that uses nuclear techniques to help ensure that the water people drink is clean. Whether the water in a well is clean or contaminated can be determined using conventional chemical analysis, but such an analysis would need to be repeated constantly to provide reassurance that the water remains safe. Understanding the flow and dynamics of the groundwater, and knowing whether it could contain surface water that is potentially contaminated, is only possible with the help of isotopes.

Isotopes are versions of 'ordinary' atoms, containing the same number of protons and electrons but one or more additional neutrons. Chemically they exhibit the same behaviour, but they have a different atomic weight and some are unstable, emitting a tiny amount of

*The main street of Ambaniala, with Madagascar's largest landfill at the end of the street. Groundwater contamination from the landfill is polluting some of the village's wells. Scientists using isotopic techniques have helped to show the villagers which well is safe to use.*





radiation, which can be measured. This way the isotopes are used as tracers by scientists known as isotope hydrologists.

“We determined that a 300 meter wide strip of the ground underneath the settlement contains contaminated or potentially contaminated groundwater, while the effluent from the garbage disposal site does not reach the rest of the water under ground in the area,” said Joël Rajaobelison, an isotope hydrologist and Director General of Madagascar’s National Institute for Nuclear Science and Technology (INSTN), which has received equipment and training for its staff from the Agency to use isotopic techniques for water analysis. “It is therefore safe to use.”

The sensitive equipment that Rajaobelison’s team uses, donated by the Agency through its technical cooperation programme, is able to detect the difference in the isotopic makeup of surface water and groundwater, and thus identify infiltration. To further increase the capacity of INSTN’s isotope hydrology lab, the Agency in 2020 initiated the procurement of a laser machine. “If the groundwater contains surface water, it may easily get polluted from the effluent even if it is clean now,” he explained.

Using another isotopic technique, the team can tell whether any body of water is coming from the landfill site or flowing toward it.

When his office was initially alerted to the problem in Ambaniala by a private citizen, who heard about the use of isotopic techniques through a national outreach campaign, his staff knew right away that INSTN could help. “For us it is a simple, routine analysis performed over a number of weeks,” Rajaobelison said. “For them it is a lifesaver.”



## CASE STUDY

## Bosnia and Herzegovina, Serbia Succeed in COVID-19 Virus Characterization with Agency/FAO Support

Veterinary laboratories in Bosnia and Herzegovina and Serbia where scientists have been trained by the Agency and the Food and Agriculture Organization of the United Nations (FAO) are able to use genome sequencing to characterize the virus that causes COVID-19. This technology allows them to see where the virus originated and support contact tracing efforts and transmission analysis. The veterinary laboratories are helping health authorities in their efforts to localize and contain outbreaks.

The real-time reverse transcription–polymerase chain reaction (real-time RT–PCR) is a nuclear derived technology that has been widely used in the detection of the virus that causes COVID-19. With this method, fluorescent dyes are used to detect the presence of specific genetic material and provide scientists with almost immediate results on the presence of a virus. Building on this technology, whole genome sequencing is used to find out more about the virus, which enables experts to understand when it was contracted and where.

“Through genome sequencing, we are able to understand more about the virus, how virulent it is and if there are any changes in the virus over time,” said Goran Čerkez, Assistant Minister at the Federal Ministry of Health in Bosnia and Herzegovina.

Tanja Jovanovic, a virologist and professor at the University of Belgrade’s Faculty of Medicine, said, “It is very important to have collaboration while assisting public health authorities in order to evaluate effective intervention and how this will change according to changes in the virus. By comparing the sequences obtained in Serbia with neighbouring

*Real-time RT–PCR is the most accurate method to detect the COVID-19 virus.*

*The FAO/IAEA Animal Production and Health Laboratory has been helping countries use this technique to detect zoonotic (animal to human) diseases like COVID-19 and Ebola for decades.*





countries, we are better able to navigate the virus and predict which containment measures should be in place.”

The Agency’s assistance, delivered through its Veterinary Diagnostic Laboratory (VETLAB) Network and technical cooperation programme, included webinars and advisory services, as well as equipment and consumables for the detection of COVID-19.

“At the beginning of the pandemic, veterinary laboratories were somewhat better prepared than human health laboratories, because we had experience in animal and zoonotic diseases and massive testing,” said Teufik Goletic, a professor in the Department for Avian Diseases and Management and Head of the Molecular Diagnostics and Research Laboratory at the University of Sarajevo. “By exchanging information and working under a One Health approach, we can collaborate with decision making bodies and better plan control measures and estimate the impact of COVID-19.”

At the Veterinary Specialist Institute in Kraljevo, Serbia, more than 13 000 human samples were tested for the COVID-19 virus. RNA was taken and analysed using whole genome sequencing at the beginning of the COVID-19 pandemic. So far, 150 whole genomes have been obtained. Using these samples, scientists found that there were multiple lines of COVID-19 viruses in Serbia, originating from several countries.

Data from whole genome sequencing are uploaded to the National Center for Biotechnology Information database, a bioinformatics web site, allowing further research by scientists around the world. When scientists perform whole genome sequencing and upload this information to the database, connections can be made globally, resulting in more in-depth and accurate phylogenetic trees. This way, the introduction of a virus can be traced to a certain place and strain.

