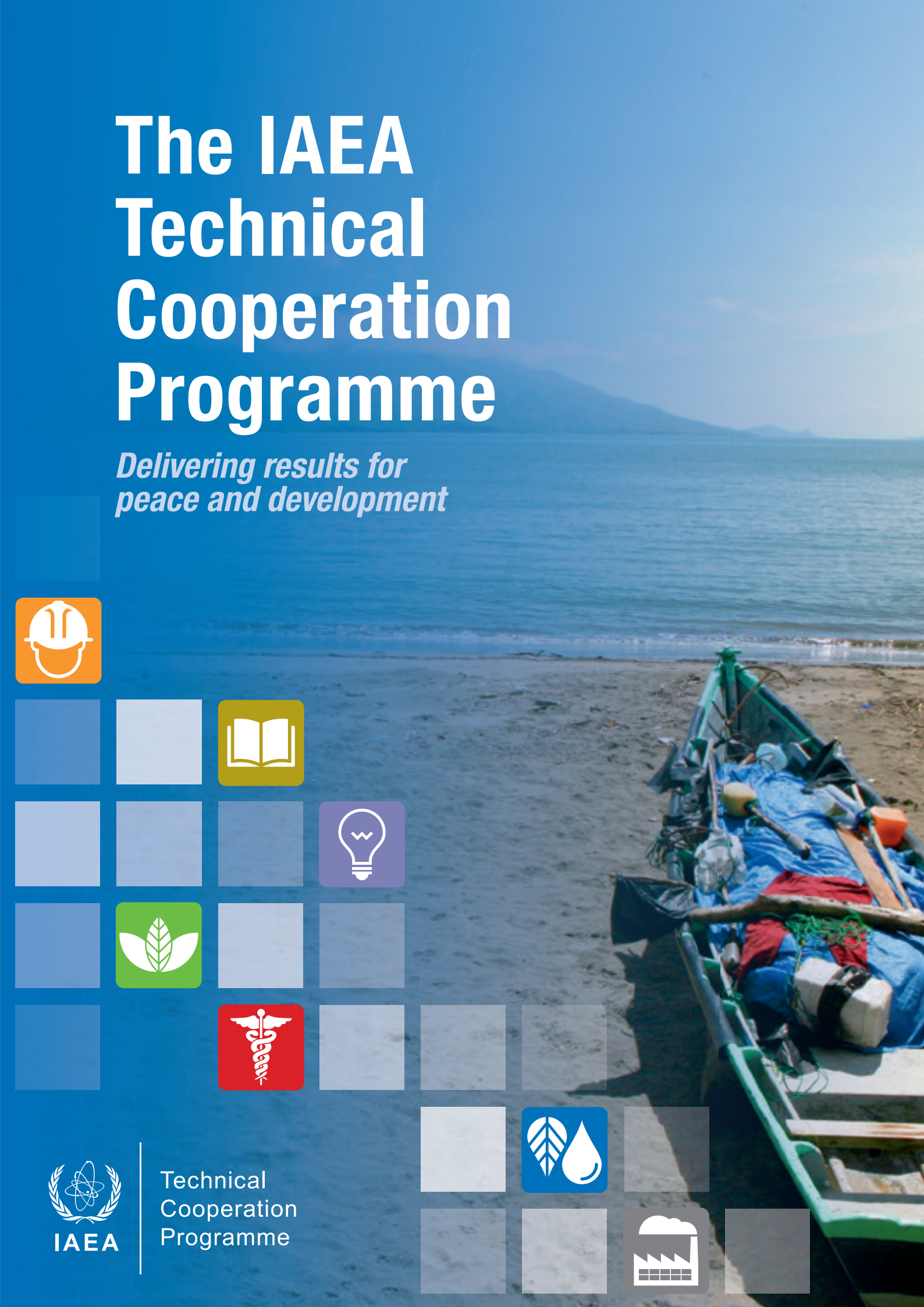
The IAEA Technical Cooperation Programme

Delivering results for peace and development



IAEA

Technical Cooperation Programme

Foreword by the IAEA Director General

The technical cooperation (TC) programme has been providing IAEA Member States with support in the peaceful application of nuclear science and technology for sixty years. During this time country capacities have increased significantly, and countries have moved from developing basic nuclear knowledge to applying it in a broad range of fields to improve daily life and wellbeing, and to achieve national development priorities. Many Member States can now offer nuclear expertise and facilities, supporting each other and making the programme a true example of effective south-south cooperation.

Today, around 138 countries and territories receive IAEA technical cooperation support in areas that include agriculture and food security, human health and nutrition, environmental resource management, energy planning and nuclear power, industrial development and safety. In general, the programme concentrates on building capacity in less developed countries, where innovative methods to address national development challenges are most needed. Alongside capacity building, the programme supports networking, knowledge sharing and the development of partnerships.

Through technical cooperation, the IAEA contributes to national, regional and international development, and to the achievement of the Sustainable Development Goals. As science and technology will make an important contribution to the achievement of the 2030 Agenda, we expect the role of the IAEA and the TC programme to further expand in the coming years.

Yukiya Amano
Director General, IAEA

Foreword by the Head of the Department of Technical Cooperation

The IAEA has been supporting cooperation among Member States through our technical cooperation programme for six decades. The programme focuses on cooperation for sustainable socioeconomic development, and builds on the skills and infrastructure that countries have acquired through working with us. Other important goals are to strengthen the linkages between science, technology and development, and to build and reinforce cooperative networks. Technical cooperation among developing countries is a key vehicle for addressing the diverse science and technology needs of countries participating in the TC programme, as it draws on regionally available skills and facilities, and strengthens links between institutions in a region.

The IAEA's technical cooperation programme demonstrates how targeted support in a specialized field at the national and regional level has contributed to the establishment of solid, institutionalized capacities in nuclear science and technology in our Member States. Around the world today, countries are sharing their own experience and know-how at many levels. I look forward to our continued work with Member States in the peaceful application of nuclear science and technology, and in contributing to efforts to address development priorities, including the relevant Sustainable Development Goals.

Dazhu Yang
IAEA Deputy Director General and Head of the Department of Technical Cooperation

What is the IAEA technical cooperation programme?

The technical cooperation (TC) programme is the main mechanism through which the International Atomic Energy Agency (IAEA) delivers services to its Member States. Through the programme, the IAEA helps Member States to build, strengthen and maintain human and institutional capacities for the safe, peaceful and secure use of nuclear technology in support of national development priorities. Initially a 'technical assistance' programme oriented towards the introduction of nuclear science and technology to Member States, the TC programme today concentrates on helping countries use nuclear technology for sustainable socioeconomic development.

The TC programme draws its mandate from Article II of the IAEA Statute, which states: "The Agency shall seek to accelerate and enlarge the contribution of atomic energy to peace, health and prosperity throughout the world". The programme's strategic goal is to promote tangible socioeconomic impact in IAEA Member States, by contributing in a cost-effective way to the achievement of the major sustainable development priorities of each country.

Contributing to sustainable development

Technical cooperation projects contribute to the attainment of national development goals by providing expertise in fields where nuclear techniques offer advantages over other approaches, or where nuclear techniques can usefully supplement conventional means.

The programme focuses on health and nutrition, food and agriculture, water and the environment, radiation technology and industrial applications, energy planning and nuclear power, radiation protection and nuclear safety, and nuclear knowledge development and management. Alongside capacity building, the programme offers networking, knowledge sharing and partnership facilitation, delivered through fellowships, scientific visits, meetings and workshops, the provision of expert advice and the procurement of equipment. The TC programme is unique in the United Nations system, as it combines specialized technical and development competencies.

TC activities are programmed according to the needs of four geographical regions — Africa, Asia and the Pacific, Europe (which includes Central Asia) and Latin America and the Caribbean — and take into consideration existing capacities and different operational conditions. The programme makes optimal use of the capacities of Member States in the same region by facilitating cooperation between them. For example, technically advanced countries in a region can provide expertise for projects in less advanced countries.

Programme policy framework

The policy framework for the TC programme consists of the IAEA Statute, the Guiding Principles and General Operating Rules to Govern the Provision of Technical Assistance by the Agency (INFCIRC/267), the 1997 Technical Cooperation Strategy and subsequent 2002 Review, and the IAEA Medium Term Strategy for 2012–2017. The provision of technical assistance by the IAEA is governed by Revised Supplementary Agreements with Member States (RSAs). The programme is managed according to the Management Principles for the Formulation and Implementation of the Technical Cooperation Programme.

Participating in the TC programme

All IAEA Member States can participate in the TC programme, and due consideration is given to the needs of the under-developed areas of the world. The TC programme is jointly developed through a consultative process with Member States, using a results-based approach.

The National Liaison Officer (NLO) is the IAEA's primary contact person within a country on all issues related to the planning, formulation and implementation of technical cooperation projects. NLO functions and competencies include leadership, strategic thinking, operational management, supervision, coordination and relationship building with a wide range of stakeholders.

Project counterparts (CPs) are responsible for managing and carrying out a TC project in a country. The CP is the driving force in achieving project results and takes responsibility for the overall management and direction of the TC project in collaboration with all stakeholders. Typically the project counterpart is a national institution with several staff involved in a TC project.

The Country Programme Framework

The Country Programme Framework (CPF) and its annexes define mutually agreed priority development needs and interests that are to be supported through technical cooperation activities. These activities are based on national development plans, country specific analyses and lessons learned from past cooperation.

A prerequisite of the CPF process is dialogue between Agency and all national stakeholders – this includes the national counterparts, national authorities, relevant ministries, relevant UN organizations, bilateral donors and other stakeholders. The CPF should reflect an understanding among all parties on where nuclear science and technology could contribute directly and cost-effectively to national development, observing the framework of the 2030 Development Agenda.

Country Programme Frameworks define mutually agreed development priorities that can be supported through IAEA technical cooperation activities.

Signature of the Egypt Country Programme Framework

Permanent Missions are strategic partners in the TC programme: they facilitate dialogue between key institutions involved in the TC programme in the Member State and the IAEA, and provide a channel for official communication. Permanent Missions provide guidance to the TC programme through General Conference resolutions and Board Decisions, and can play an important role in raising awareness of the TC programme and in mobilising funds. An active, engaged Permanent Mission makes a significant contribution to a strong, focused national TC programme.

The TC programme is drawn up on a biannual basis. Project concepts are developed by each participating Member State in cooperation with the IAEA Secretariat, drawing on Country Programme Frameworks (CPFs) where available, national development plans, and United Nations Development Assistance Frameworks (UNDAFs) as appropriate. These concepts are reviewed by the Secretariat for technical feasibility, and any safety issues are identified and addressed.

Projects are also assessed for proliferation risks, in accordance with the IAEA Statute, INFCIRC/267, and all other relevant decisions by the IAEA Policy Making Organs. The programme is then reviewed by the Technical Assistance and Cooperation Committee (TACC), and approved by the IAEA Board of Governors.

Fellowships and scientific visits, and participation in meetings, workshops and trainings, must be related to an on-going IAEA technical cooperation project, and must be channelled through the NLO of the applicant's country. Other forms of programme involvement include participation as a resource institution, a provider of expert services, or as a supplier of goods or services.

Areas of work

Health and nutrition

Diagnostic radiology, nuclear medicine and radiation oncology are important tools for the diagnosis, treatment and management of major illnesses, including non-communicable diseases.

The IAEA's technical cooperation programme provides countries with specialized training and infrastructure so that they can use nuclear techniques to address the challenges of cancer, malnutrition and obesity, and chronic disease. Nuclear technology can also be used to assess the immune responses of individuals infected by diseases, and to monitor the emergence of drug resistance.

The TC programme, through the Programme of Action for Cancer Therapy (PACT), helps developing countries build sustainable programmes for comprehensive cancer control. TC projects also provide training to improve cancer management.

In addition, the TC programme supports the planning and evaluation of nutrition programmes, and helps establish quality assurance programmes for nuclear medicine, radiation oncology and diagnostic radiology.

Food and agriculture

Boosting agricultural production requires enhanced crop varieties, effective pest and disease control, increased soil fertility, better soil and water management, and improved food quality and safety. The IAEA, in partnership with the Food and Agriculture Organization of the United Nations (FAO), helps Member States to produce more, better and safer food using nuclear technology, while promoting the sustainable use of agricultural resources.

Technical cooperation efforts focus on improving yield and quality by enhancing the diversification and adaptability of crops through mutation induction breeding programmes. Projects also help Member States to cut pesticide use and to reduce the crop losses caused by pests and diseases, and to overcome phytosanitary barriers to trade. Other TC projects help Member States to improve soil and agricultural water conservation, reduce pesticide residues and monitor agricultural pollutants.

The IAEA also helps Member States to improve livestock productivity. TC projects concentrate on the efficient use of locally available feed resources, and on improved reproductive techniques and breeding programmes for indigenous and advanced animal breeds. Projects also improve diagnostic capacities and prophylactic strategies for the control of important transboundary animal diseases, including zoonotic diseases, and can help Member States to track the transmission pathways of infectious diseases such as avian flu.

Water and the environment

In a world facing severe challenges to the environment and to water resource availability, nuclear science and technology can help countries to manage and make the most of their natural resources. IAEA environmental activities focus on using nuclear techniques to understand and protect the environment, and on the sustainable management of natural resources.

TC projects help Member States to measure pollutants and environmental radioactivity in air, land and oceans, and support the ability of Member States to manage and protect marine resources and coastal zones. Nuclear techniques also provide researchers with tools to study the ocean's past and predict its future, and are used to monitor and assess the effects of climate change, such as ocean acidification, and to validate global climate models and ocean circulation models.

Isotope hydrology is used to improve understanding and quantification of groundwater resources. TC projects promote the use of isotopic techniques to identify and study the sources, extent, transport, quality and interactions of the different components of the water cycle, and to support the development of comprehensive national and transboundary water resource plans for sustainable water management. Isotope hydrology is also used to enhance the efficiency of water use in agriculture.

TC projects also help Member States to manage air quality and carry out environmental monitoring. Nuclear techniques improve understanding of sources and sinks of pollutants, their transport pathways and their ultimate fate. Nuclear techniques are used to support environmental remediation, measuring changes and the impact of environmental interventions over time, and mitigating damage. Additionally, radiation processing technology, in combination with other techniques, offers improved environmental safety through effective treatment of wastewater, and supports the reuse of treated wastewater for urban irrigation and industrial purposes.

Radiation technology and industrial applications

Radioisotope and radiation technology is applied in a wide variety of fields, most importantly in medicine, industry, agriculture and environment. Technical cooperation projects strengthen Member State capacities by providing advice, assistance and capacity building support, as well as ensuring quality assurance and quality control.

Through TC projects, the IAEA provides Member States with support in the development, production and quality assurance of reactor and accelerator based medical isotopes and radiopharmaceuticals for both diagnosis and treatment of diseases, especially cancer.

Projects also support the establishment of irradiation facilities and the utilization of gamma radiation, electron beam and X-ray technology for varied applications, including tackling pollutants, wastewater treatment, sterilization of medical products and disinfestation of food grains or cultural heritage artefacts.

Other TC activities focus on the development of advanced materials and products based on synthetic and natural polymers, ranging from super water adsorbents and plant growth promoters to drug delivery and tissue engineering.

The IAEA also helps Member States to apply radiation and radioisotope tracers in industrial and environmental process assessment, optimization and management, as well as for quality control of products, utilization of non-destructive techniques to improve the quality of industrial goods and services, and operational safety in various industries.

In addition, the TC programme builds Member State capacity in nuclear physics by establishing teaching laboratories at universities, providing instrumentation training and supporting the installation of accelerators and more effective research reactor utilisation.

Energy planning and nuclear power

The IAEA, through the technical cooperation programme, helps developing countries to build comprehensive energy planning capabilities, and supports countries that are exploring the establishment of, or already have, a nuclear power programme. For countries considering the nuclear power option, the IAEA offers a broad range of supporting activities.

When a country is considering the introduction of nuclear power into its national energy mix, the IAEA advises a comprehensive step-by-step approach, the IAEA Milestones Approach, which integrates the relevant input of that country's governmental, industrial and educational institutions.

Through the TC programme, the IAEA helps Member States to build the necessary nuclear power infrastructure in an integrated manner. Upon request from a Member State, the IAEA conducts an Integrated Nuclear Infrastructure Review (INIR) mission, a holistic peer review to assist Member States in assessing the status of their national infrastructure for the introduction of nuclear power. INIR missions may later be used as the basis for comprehensive planning and finalization of Integrated Work Plans (IWP) that incorporate all relevant actions and activities required for the safe, secure and sustainable introduction of a nuclear power programme.

Radiation protection and nuclear safety

One of the IAEA's key objectives is to help countries to upgrade their radiation and nuclear safety infrastructure and to prepare for and respond to emergencies. Work is keyed to international conventions, standards and guidance, and aims to protect people and the environment from harmful exposure to radiation.

Assistance in radiation protection and nuclear safety is provided to Member States through dedicated projects covering strengthening regulatory infrastructure, occupational exposure control, medical exposure control, protection of the public and the environment from radiation practices, nuclear and radiological emergencies, education and training, and transport safety.

Nuclear knowledge development and management

Nuclear knowledge management is very important to ensure the long term sustainability of national nuclear institutions. As scientists, engineers and technicians retire, it is essential to help preserve their valuable knowledge, and to transfer it to the young professionals who will replace them.

The IAEA's technical cooperation programme supports training in managing nuclear knowledge for professionals from nuclear institutions, either through supporting their participation in specialized schools organized by the IAEA and its partners, or through distance learning. With support that includes the sharing of expertise, hands-on experience and mentoring, young professionals are better equipped to contribute to their country's use of nuclear science and technology both now and in the future.

Recently, technical cooperation projects have also offered countries resources and activities to support the teaching of nuclear science and technology in secondary schools, providing pilot countries with assistance for both teachers and students.

Technical cooperation project types

TC projects can be national, regional or interregional in scope.

National projects: National projects address the needs of a single country and focus on infrastructure building in support of national development priorities where the use of nuclear technology is essential for the achievement of national objectives or offers a cost-effective, safe and secure solution.

Regional projects: A regional project addresses the common needs of a group of Member States in a region, and provides support to ongoing national capacity strengthening efforts. A regional project provides a framework for pooling resources, sharing knowledge, experience and technology, for networking and cooperation among countries of a region or sub-region, and for facilitating interaction at the regional level between mandated national institutions. Regional projects support activities that are transnational, related to regional standard setting, capacity building or carried out jointly with a regional or interregional entity.

Interregional projects: Interregional projects deliver support across national and regional boundaries, and address the needs of several Member States in different regions. Interregional projects are categorized as transregional, related to global standard setting, capacity building, or as joint activities with an international entity.

Regional Cooperative Arrangements and Cooperative Agreements

There are four Regional and Cooperative Agreements under the auspices of the Agency. They are meant to strengthen the contribution of nuclear science and technology to socioeconomic development, and provide a framework for addressing common issues through joint activities. Regional cooperative arrangements and cooperative agreements coordinate regional collaboration among States Parties of an agreement through projects that focus on specific shared needs and priorities.

The cooperative mechanisms are the African Regional Cooperative Agreement for Research, Development and Training related to Nuclear Science and Technology (AFRA), the Regional Cooperation Agreement for the Promotion of Nuclear Science and Technology in Latin America and the Caribbean (ARCAL), the Regional Cooperative Agreement for Research, Development and Training Related to Nuclear Science and Technology for Asia and the Pacific (RCA), and the Cooperative Agreement for Arab States in Asia for Research, Development and Training related to Nuclear Science and Technology (ARASIA). Regional cooperation in Europe is guided by the ‘Strategy for the TC Programme in the Europe Region’.

Managing and funding the TC programme

Who manages the TC programme?

The TC programme is developed and managed jointly by the IAEA Member States and the IAEA Secretariat. The Department of Technical Cooperation provides structured, multidisciplinary, Agency-wide coordination of the programme, and overall management guidance and support to Member States. The IAEA's technical Departments provide scientific and technical support, and are responsible for the technical integrity of the TC programme and for safety and safeguards related issues.

How is the TC programme funded?

The TC programme is funded mainly through the Technical Cooperation Fund (TCF), to which Member States contribute on a voluntary basis according to a scale of assessed contributions. In addition, extrabudgetary funding from donors, including the Peaceful Uses Initiatives (PUI), government cost-sharing and in-kind support, is actively sought. The TC programme is managed and staffed through the IAEA regular budget.

The TC central criterion and quality

All projects must meet the TC central criterion: they must address an area of real need in which there is a national programme enjoying strong government commitment and support. Projects that meet the central criterion must produce a tangible socioeconomic benefit in an area where nuclear technology holds a comparative advantage, or must clearly support an enabling environment for the use of nuclear technologies (such as safety infrastructures, or energy planning).

All TC projects must also meet specific quality criteria that devolve from the central criterion. These criteria set and maintain standards of quality in project planning, design, implementation and evaluation throughout the project and programme lifecycles. The TC quality criteria include relevance, ownership/commitment, effectiveness, efficiency and sustainability. TC's quality based planning process lays the foundation for efficient project implementation and effective programme delivery, and ensures the sustainability of results achieved. The TC programme uses the Logical Framework Approach (LFA) as the results-based management tool.

Project Counterparts from Latin America and the Caribbean learning more about the Logical Framework Approach.

Technical cooperation, partnerships and development

IAEA and the Kuwait Institute for Scientific Research sign a Practical Arrangement for cooperation on marine environmental monitoring and protection.

Nuclear techniques provide a viable, cost effective solution to many development problems (for example, nuclear induced mutation breeding produces new crop varieties that have higher yields, are more resistant to pests and viruses, or more tolerant of climate variability). In addition, they generate credible, timely data that help countries make informed decisions on national and regional policies and plans (for example, information collected using isotope techniques support water resource management and nutritional interventions). The experience of the technical cooperation programme in contributing to the achievement of the Millennium Development Goals has demonstrated the concrete impact of science and technology interventions in addressing globally agreed development goals.

More than half of TC programme activities, however, address sectors where the IAEA —

a scientific, technical organization — does not possess the lead UN mandate, such as human health, food and agriculture, and water and the environment. In order to connect science to national development, and to maximize the contribution of nuclear science and technology to the achievement of development priorities, the IAEA works to build partnerships between national scientific, technical and regulatory institutes and developmental authorities at all levels. Strengthening the role of science and technology in national development also makes an essential contribution to addressing global problems of climate change, sustainable resource management, communicable diseases, sustainable energy and other challenges of the 21st century.

While the IAEA technical cooperation programme has no field presence, the IAEA participates actively, to the extent possible, in global joint programming initiatives such as the United Nations Development Assistance Framework (UNDAF) in order to achieve better national development outcomes and to leverage synergies among UN organizations. Through Practical Arrangements, other agreements and working relationships with partner organizations at every level from national to international, the impact and sustainability of IAEA services is extended and benefits are multiplied. Collaborative work through partnerships ensures the coordination and optimization of complementary activities and leads to a more streamlined response to development issues, strengthening project outcomes and ensuring the best possible socioeconomic impact of the TC programme.

Science and technology are vital for the full and successful achievement of the Sustainable Development Goal (SDG) targets. The IAEA can contribute directly to eight of the 17 Sustainable Development Goals (SDGs), in addition to SDG 17 on a revitalized global partnership. Working with other United Nations agencies, and with research and civil society organizations at national and international levels to maximize the contribution of nuclear science and technology to the attainment of Member State SDG targets, the TC programme contributes to ending hunger and ensuring good health and well-being, supporting the availability and sustainable management of water and access to reliable, sustainable energy, promoting industry and innovation, combatting climate change, and the conservation and sustainable use of marine resources and the environment.

TC programme services

The IAEA technical cooperation (TC) programme supports human resource capacity building activities and the procurement of equipment. Human resource capacity building is supported through the provision of fellowships and scientific visits, by expert missions and meetings, and via special workshops and training courses focusing on the safe, effective and peaceful application of nuclear technology.

Training fellowships prepare local personnel to apply nuclear techniques in the national sector. Fellows are sent abroad for comprehensive training in a suitable institution for periods up to one year, and in certain cases longer fellowships are considered.

Scientific visits broaden the scientific or managerial qualifications of senior specialists in developing countries. Scientific visits may last up to two weeks.

Training courses and workshops provided through the TC programme cover a wide range of topics related to the peaceful application of nuclear technology in various fields. They build local expertise and strengthen networking by bringing together researchers, technicians and other national practitioners from across the developing world.

Conferences, symposia and seminars are designed to support the exchange of ideas between experts and specialists from various countries.

Expert assistance makes available on-the-spot in-country training by a recognized expert.

Equipment and materials provided by the IAEA are used to establish or enhance national development activities in Member States. When complex equipment is supplied to a country, the project usually includes the visit of an expert to train the staff in the operational and technical aspects of the instrument.

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