

Pillars of Peace

The Evolution of Nuclear Technical Cooperation

“Preceding generations have presented us with a highly developed science and technology, a most valuable gift which carries with it possibilities of making our life free and beautiful to an extent such as no previous generation has enjoyed. But this gift also brings with it dangers to our existence as great as any that have ever threatened it.”

—Albert Einstein, 1930

“The discovery of nuclear chain reactions need not bring about the destruction of mankind any more than did the discovery of matches. We only must do everything in our power to safeguard against its abuse. Only a supranational organization, equipped with a sufficiently strong executive power, can protect us.”

—Albert Einstein, 1953

by Ana Maria Cetto

The twentieth century witnessed unprecedented scientific and technological progress, unfortunately paralleled by the development of weapons of mass destruction. And with this progress came an incredible amount of responsibility for scientists and governments. The creation of the IAEA and its technical cooperation programme brought together scientists and governments to use nuclear technology for the “peaceful pursuits of mankind.” The programme supports application of nuclear techniques to solve socio-economic and human development problems in areas as diverse as agriculture, health, natural resource management, and radiation protection.

Fifty years after President Eisenhower’s famous “Atoms for Peace” speech, the IAEA technical cooperation programme provides more than \$70 million worth of experts, training, and procurement services each year to approximately 75% of its 137 Member States. But as development budgets shrink, the programme is seeking to make more meaningful use of resources at hand (national capacities, regional resources, development partners and the voluntary Technical Cooperation Fund), targeting specific problems of Member States and partnering with other sustainable development organizations. At the same time, efforts continue to overcome the past legacy that necessitated the “Atoms for Peace” proposal in the first place.

Even as development challenges are addressed, the IAEA, its partners and governments face other challenges along the way, including public opinion for a technology that had a devastating global introduction.



The IAEA’s technical cooperation and related activities are supporting national development strategies and plans. The scene is Palmyra in Syria.

The TC Planning Toolbox

“It is not enough to take this weapon out of the hands of the soldiers. It must be put into the hands of those who will know how to strip its military casing and adapt it to the arts of peace.”—President Eisenhower, 1953

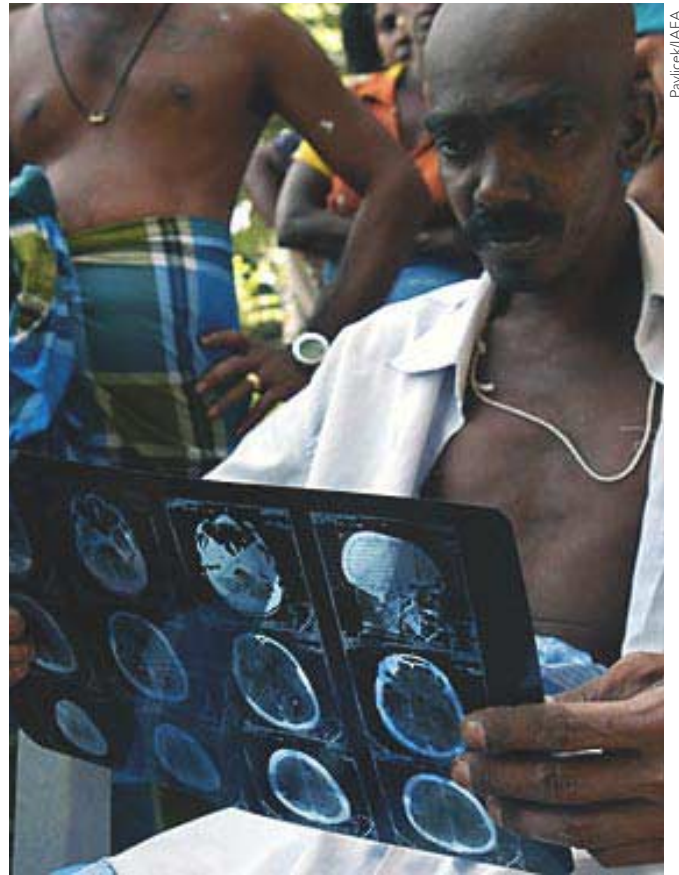
In the early stage of the IAEA Technical Cooperation, or “TC” programme, few Member States had nuclear activities. The Agency focused its programme on capacity building, with strong emphasis on nuclear power. But, as years passed, the field of nuclear technology expanded and the scientific atomic pillars “of peace” began to display themselves: nuclear techniques in medicine were saving lives and providing hope for cancer patients; drought and pest resistant varieties of plants were being developed by speeding up the mutation process. At the same time, years of expansion and experience in nuclear technology gave rise to environmental and waste concerns. The Agency thus became an important promoter of nuclear science-based technology while at the same time working to ensure that a national radiation protection infrastructure existed to protect the public and environment.

More than 40 years later, the focus has turned from promoting nuclear technology to overcoming obstacles in development with the help of such technology. But how does the Agency know the development needs of a country or region? How does the Agency work with Member States and regions to develop a plan for the next year, two years, five years or a decade?

Among the tools in the TC planning process are thematic plans, country programme frameworks (CPF), and upstream work, all of which are used to garner the greatest impact in support of development.

Thematic plans provide programmatic guidance on the application of nuclear techniques, drawing on the IAEA’s best practices and experiences. Part of this guidance is comparing conventional non-nuclear techniques with nuclear technology, ensuring the cost/benefit of the latter. Thematic plans also define the IAEA role and responsibility in relation to other stakeholders, identifying resource requirements and outlining a course of action. In developing them, the IAEA calls upon experts in the thematic field, technology experts, and counterparts from regions trying to overcome developmental obstacles where nuclear technology plays a role.

Thematic plans then feed into a CPF, folding in a global planning tool into a national planning tool. Once the impact of a nuclear technique on a developmental problem is proven and guidance on the application of that technique in technical cooperation defined, a specific plan on a national scale can be formulated geared to the country’s nuclear capacity and available resources. The CPF provides a clear focus for technical cooperation with a Member State



A patient in Sri Lanka views an X-ray of a brain tumour treated with radiotherapy.

by examining the broader context of problems experienced in that country.

Whereas thematic plans are facilitated and more wholly and developmentally owned by the Agency, CPFs are a product of a country’s effort to make the most of and sustain the achievements from the technical cooperation programme. In fact, the process of developing a CPF has often shown to yield the greatest benefit, as its goal is to ensure that IAEA activities are linked to well-defined national development objectives and priorities. This looks to engage all stakeholders in project planning, formulation and implementation. Though the IAEA primary counterpart in a Member State could be the ministry of energy or the atomic energy authority, input from other sectors is necessary—such as the ministries of health, environment, or agriculture. This also leads to building partnerships between counterpart organizations and other national authorities involved in national social and economic development in order to ensure the sustainability and impact of technical cooperation activities.

Taking the planning process further, upstream work with counterpart organizations, supported by IAEA’s technical departments, develops specific projects for a given work cycle. Missions to Member States and regional coordination meetings take place during the year before the biennial



A technician in the entomology unit at the IAEA's Seibersdorf Laboratories, which supports countries seeking to control and eradicate insect pests hurting their agricultural economies.

technical cooperation programme is proposed to the IAEA's Board of Governors for approval. These interactions with counterparts review past technical cooperation as well as resource growth and expectations, to develop a project work plan that is achievable and to identify expected results that are measurable.

The Power of Partnerships

An important part of the planning process includes identifying additional partners for technical cooperation. Previously, other national organizations or ministries acted as sole partners—today “partners” refer also to development partners, funding agencies and expert organizations.

The IAEA's role in offering solutions that promote sustainable national development can be small, yet vital. Referencing a popular advertising campaign, the IAEA does not make the water flow, it helps ensure that the water will continue to flow; it does not treat cancer, it ensures the safety of the patients and workers at the cancer treatment centre; it does not fight malnutrition, it transfers the technology to ensure that fortified food is relieving micronutrient deficiencies.

For the IAEA to be effective, clearly its partners in development should be those organizations that have the responsibility or mission to manage water resources, cure cancer, feed the world's starving, and care for the world's malnourished. For example, certainly the leading global role for combating the resurgence of tuberculosis (TB) in Africa lies with the World Health Organisation. As in other developing

countries, diagnosis of TB there has been based on the acid-fast smear test, a time-consuming test that was inadequate in cases of primary drug-resistant TB and inefficient in preventing further spread of the disease. To support national efforts, the IAEA worked with universities and hospitals to develop isotope molecular methodologies for accurate and rapid detection of multi-drug-resistant strains of TB. As a result, resistance was identified and patients treated accordingly—this shortened the strain identification time and saved costs associated with the use of medications that would not help patients.

Examples in East Asia and the Pacific, where the IAEA has been involved in reducing micronutrient malnutrition, offer other glimpses of successful partnerships. The Agency transferred technology to national nuclear institutions to verify that the minerals in fortified food were being absorbed by the body. This technology transfer led to a partnership with the Asian Development Bank, which is funding a major initiative to reduce micronutrient malnutrition in the region.

Issues of the security of nuclear materials has also encouraged partnerships with non-governmental organizations and governments. The costs involved in exchanging highly enriched uranium (HEU) for low-enriched uranium to fuel research reactors meant the Agency and Member States had to identify financial partners to assist with the removal and return of the HEU to the country of origin.

Today, functional relationships with partners are critical to the success of any technical cooperation programme. However, many decision-makers in international institutions that address human and sustainable development challenges ignore or are unaware of the benefits that nuclear science and technology could bring to their programmes. At the national level, few people know that nuclear science and technology are highly valuable tools to improve human health, increase agriculture production and productivity, and manage natural resources. Hence, the IAEA must invest in a stronger communication effort to obtain the desired support by new partners. A well-directed external communications approach would also contribute to helping Member States improve public understanding of the contribution nuclear science and technology can make to national development.

Drawing on Homegrown Expertise

IAEA partners for technical cooperation are not limited to outside organizations or foundations; today they may be found, first and foremost, in the countries themselves, or in neighbouring ones. After years of capacity building, an important pool of expertise now exists within IAEA Member States. In all regions, resource centres exist that have specific expertise in the peaceful use of nuclear technology, such as non-destructive testing, nuclear instru-

mentation repair and maintenance, radioactive waste management, environmental monitoring, production of radiopharmaceuticals, analytical services, radioisotope production, nutrition, irradiation for sterilization, nuclear installation operations, and radiation protection.

Using the resources developed over the years has led to varying degrees of self-reliance of national nuclear institutions and to the strategic realignment of their programmes with those of the country's development programmes. Both in East Asia and in Africa, projects have been initiated to share information between national nuclear institutions in the region on the experiences and lessons learned from taking nuclear technology to the marketplace; in some cases, nuclear institutions have achieved sizeable financial gains.

Technical cooperation among developing countries (TCDC) is also a powerful mechanism that can develop a network of partners within a region and between regions. When developing project proposals, counterpart organizations are recognizing the value of using TCDC and regional capabilities, and are looking to the IAEA to play a different role, one of facilitator and monitor of technical cooperation, rather than a provider of assistance.

Technical cooperation within and between regions can only happen if the capabilities are accurately known and recognized. To promote TCDC more effectively, the IAEA will begin construction of an information-sharing system on nuclear capacities in developing countries, based on a comprehensive, organized and updated mapping of such capacities. It is envisioned that information regarding institutions, human resources, training courses, instrumentation, and other programmes will be available for other counterpart institutions to view, inquire and utilize. This web-based system will be linked with other relevant databases and will



M. Marzof/FAO

Farmers and agricultural economies are benefitting from nuclear applications.

allow participants to update their own information. The overall objective is to strengthen South-South cooperation and networking and to enable the IAEA and other organizations to make better use of capacities in developing countries for international cooperation.

It is with this sense of greater South-South networking and support that the nomenclature of participants in technical cooperation is changing. After more than 40 years, the idea of Member States being strictly recipients or donors is certainly out of date due to the wide range of resources and capacities that the countries put to the disposal of technical cooperation. In the IAEA programme, all countries receive something, all have something to give or share. This is true cooperation.

As IAEA technical cooperation evolves and the capabilities of the countries grow, a different role lies ahead, one that calls for the IAEA to be more of an advisor, facilitator and collaborator in cooperation. The prospects are as challenging as they are exciting—for the role of nuclear technical cooperation and for the world's safe and peaceful development.

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Several African countries are participating in an IAEA regional project to use isotope hydrology to tap freshwater sources. Pupils in a primary school draw fresh water from a local well.