# Experts without frontiers: Building expertise for the transfer of nuclear technolgies

## *National and international experts recruited by the IAEA share their experience to strengthen skills in developing countries*

**by Robert Lauerbach and Alicia Reynaud**

*Arriving at Kenyatta airport, the physician was set for a relaxing flight back to Vienna. It had been an intensive two weeks of work in Kenya, finalizing procedures for an IAEA cancer radiotherapy project at the country's Institute of Nuclear Medicine. His Kenyan counterparts had organized a thorough work programme — they had even met in the evenings and on the weekend. The project — which was designed to strengthen the skills and practices in Kenya for the treatment of cancer — was now into its second year and nearing completion. He had been involved from the start, in the capacity of an expert recruited for a temporary assignment. His permanent job back home in Germany was to head the Institute of Nuclear Medicine at the University of Heidelberg.*

*Now, as he waited out a flight delay, his thoughts turned to his mission report. He was pleased by both the project's progress and support. Recommendations from his last mission had been well received at IAEA headquarters in Vienna, including financial support for a cobalt-60 radiotherapy unit that Kenya acutely needed to treat patients. As a radiotherapist, he knew the field well, the problems and pitfalls — and the benefits and rewards. This was his fifth assignment as an expert on a specific project of the IAEA's technical co-operation programme. Not all missions went as well as this one, but then no one ever said it would be easy...*

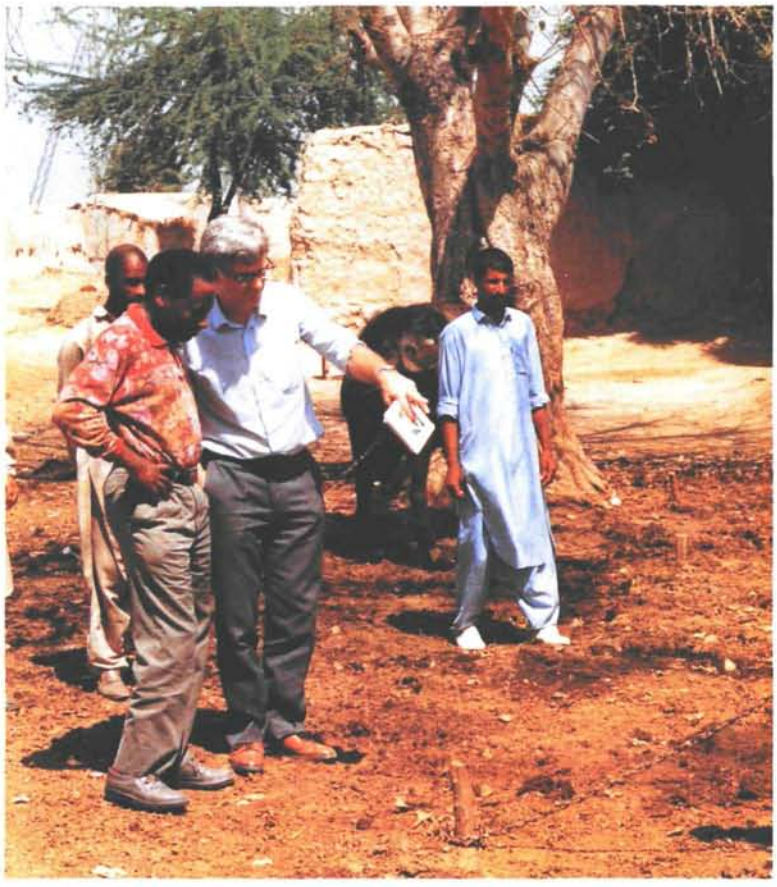
This short description of an expert assignment is a snapshot of the day-to-day life of hundreds of experts recruited by the IAEA each year. Over the last decade, the IAEA has planned and carried out nearly 18 000 expert assignments within the framework of its technical co-operation programme. The programme functions as the turntable for the transfer of nuclear technology to the developing world, assisting countries in achieving self reliance for the many applications of nuclear science and technology.

As the snapshot illustrates, the transfer of nuclear technology is more than the generation of energy in nuclear power plants. The IAEA's technical co-operation programme focuses on the safe application of radioisotopes and radiation technologies in food and agriculture, human health, hydrology and industry, and various other fields. These technologies are used, for example, to improve food crops, eradicate pests, determine groundwater resources, sterilize medical supplies, check airplane structures, monitor environmental pollution — and treat the ill.

There is a growing need to transfer these established technologies, still concentrated in certain countries, to countries where such resources remain in short supply. The major vehicles for technology transfer to the developing world are technical co-operation projects. Right now, there are more than 1000 such projects operational within the IAEA. Within them, the development of human resources is a key element for helping countries achieve scientific and technological self-reliance. The carriers of nuclear technologies are scientists and engineers who are ready to share their expertise with their colleagues in developing countries. Their missions take them across national boundaries, making them, in a real sense, "experts without frontiers".

Experts work within the institutional framework of nuclear energy's peaceful development. In practice, this means that special attention is devoted to safety and safeguard aspects. Nuclear technology's peaceful uses are

Mr. Lauerbach and Ms. Reynaud are staff members in the Experts Section of the IAEA Division of Technical Co-operation Implementation.



**On assignment near the Pakistan and Indian border for a joint IAEA/FAO animal health inspection, an expert talks with local livestock owners.**
*(Credit: Feldman, IAEA)*

monitored throughout the world by means of international agreements, such as the Treaty on the Non-Proliferation of Nuclear Weapons (NPT), and international guidelines and regulations on the basic safety standards for radiation protection, for example. This has led to close interaction between the donors of the technology, the experts, financial contributors, recipient countries, and the IAEA.

In this article, the role that experts play within the context of IAEA technical-co-operation programmes is featured. Also reviewed is the provision of expert services, including the types of assignments, and the process of recruitment. Expert services have become one of the pillars of technical co-operation at the IAEA, alongside the provision of equipment and fellowships and the organization of training courses and workshops.

## The provision of expert services

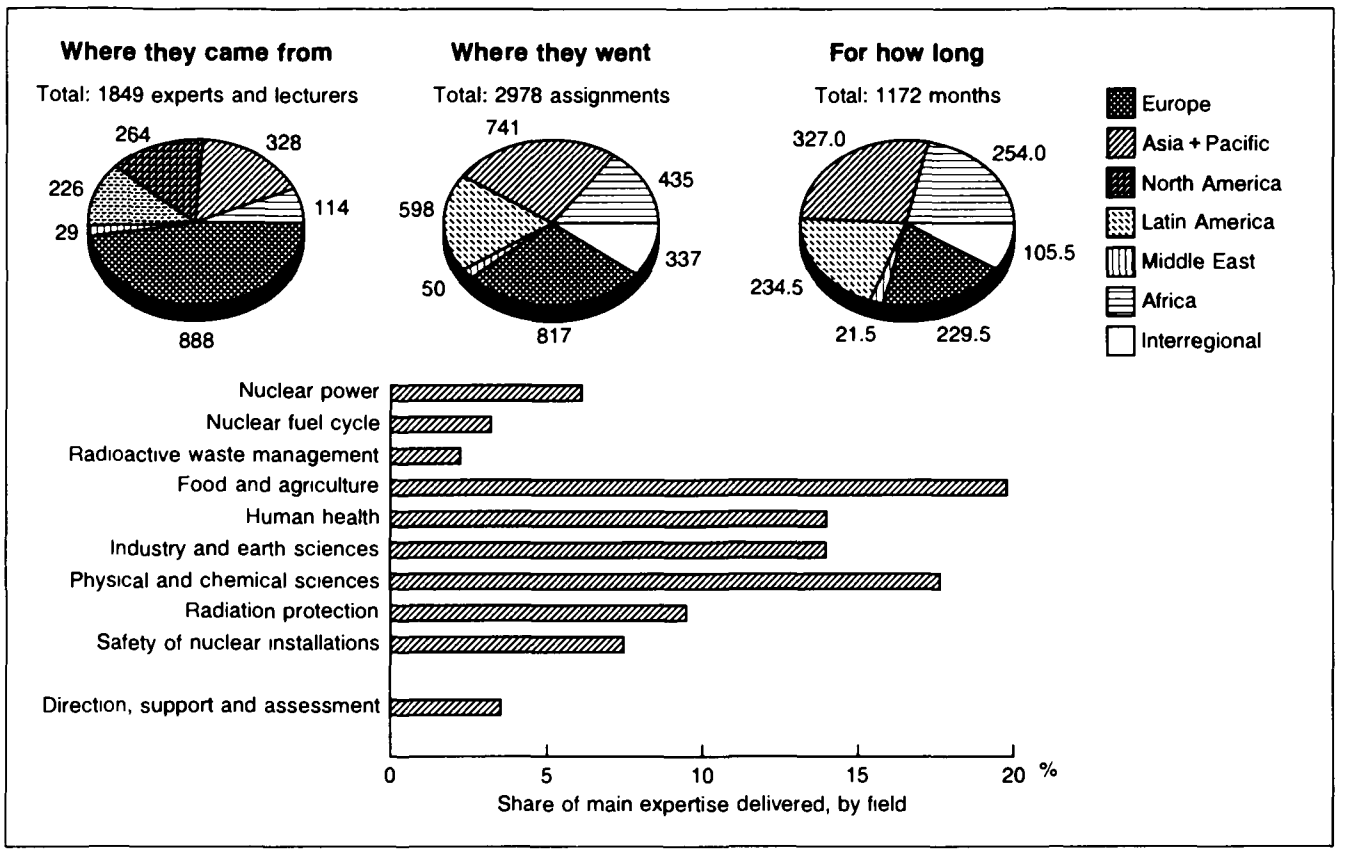
The IAEA has been providing technology transfer services through expert assignments since 1958. Typically, experts work on projects of their expertise and function as advisors, lecturers, or workshop participants. Recruited for a limited period only and ready to travel to other countries and continents, an expert is a special kind of person. He or she possesses the knowledge of a sophisticated technology, and has the ability to share it effectively with others.

Applied nuclear science and technology covers a wide range of subjects and requires a multitude of different specializations. *(See graphs.)* Five areas stand out. The applications of isotopes and radiation technology in food and agriculture have for a number of years been the single most important expert activity. They are followed by applications of physical and chemical sciences; human health activities, including the production of radiopharmaceuticals; earth sciences, covering activities such as the development of water resources; and industrial development, with emphasis on non-destructive testing techniques. For all these applications and technologies, safety-related activities in the field of radiation protection account for a large share of expert services. They are prerequisites for technology transfer and help ensure that an adequate infrastructure exists or is established in the recipient countries.

Who are the experts and where do they come from? The typical IAEA expert is a man, between 35 and 60 years old, with at least 10 years' relevant experience in the application of isotopes and radiation after his postgraduate degree in science or engineering. He is fully aware of the radiation protection rules and procedures within his specialization. His career is frequently related to national or international development and he is member of professional societies. He masters at least one or two of the United Nations languages and last, but not least, he is interested and enthusiastic to share his experience with others in the developing world.

But what about the women? Experience shows that they can easily match the standards of their male colleagues. However, there are not enough women who apply for expert posts. Only 6% of the IAEA's expert roster — a computerized list of expert candidates which comprises more than 5000 candidates — are women. It is one of the goals of the IAEA's technical co-operation programme to increase the participation of women. For this it relies heavily on the promotion of women at the national level and the encouragement of women by national authorities to apply for international posts.

The IAEA distinguishes between two major types of experts financed by its technical co-operation programme — those who work for projects other than those of their own country (who are called international experts) and those who work for their own country's projects (national experts). Depending on the project's scope and required work, the same person can serve as




**IAEA expert assignments in 1993**

a national or international expert. In recent years, the component of national experts has increased steadily. In 1993, it reached a level of 25% of all assignments. Such assignments are playing an increasingly important role in technology transfer.

Experts come from all parts of the world. In 1993 alone, the IAEA recruited experts from more than 100 countries and practically all IAEA Member States contributed to the exchange of expert services. During that year, the number of experts recruited and sent on mission reached a peak of nearly 1900. While the majority of the expert assignments is carried out by persons not belonging to the staff of the IAEA, about 20% are staff members. Normally, external staff obtain leave of absence from their employer to work for a limited time for an IAEA technical co-operation project.

About two of every three experts come from industrialized countries. The IAEA is encouraging experts from developing countries to play a larger role in providing expertise to other developing countries, preferably within the same geographical region. This is especially applicable for the Middle East and African regions, which do not yet supply a substantive number of expert services. On the other hand, Europe as a region, supplies nearly half of all expert services. Among individual States, the major providers are the United States and United Kingdom, followed by Germany and Canada. Among developing countries, India, Argentina, Brazil, and Hungary take the lead in the number of experts they provide. *(See graphs.)*

Where do the experts go and how long are they assigned? Most IAEA technical co-operation projects include what is called an "expert component" in their implementation plan. Currently, expert missions take place in some 80 countries in all parts of the world. The geographical scope is likely to increase, as experts are assigned to new IAEA Member States, notably to countries that have emerged from the former Soviet Union. Currently, the highest numbers of experts are recruited for assignments in Europe, followed by the Asia and the Pacific region, and Latin America. Recruitment for assignments to the Middle East and African regions is lower than one would expect.

Over the past 10 years, the average length of an expert mission has fallen from one month to two weeks. At the same time, the number of missions has more than doubled. This reflects the increasing self-reliance of developing countries, enabling the scheduling of shorter and more specialized missions. It is also reflects greater international co-operation, including more workshops, training courses, and co-ordination meetings, during implementation of technical co-operation projects.

## The process for recruiting experts

The recruitment and fielding of experts for the IAEA technical co-operation programme is a complex task, entailing numerous administrative steps which involve multiple partners. These partners include the IAEA, the recipient and the donor countries, and often other international agencies such as the Food and Agriculture Organization (FAO), World Health Organization (WHO), and United Nations Development Programme (UNDP). In order to recruit and field the right expert at the right time, close interaction is required with governments, recruitment sources, project counterparts, UNDP offices, and most importantly, the expert.

The terms of reference for an expert assignment are summarized in a job description which serves as the base for recruitment. Upon receipt of a job description from the responsible project officer, the IAEA Experts Section approaches suitable candidates. This is done in accordance with the various procedures requested by the sending and receiving governments and based on the nature of the assignment. The sources involved in locating expert candidates to undertake assignments in technical co-operation projects may differ from case to case. Main contributors are the recipient country itself which has specific experts in mind; the IAEA technical officer responsible for a specific project, suggesting experts or institutions in which experts could be located; and the Experts Section's own roster of experts, a computerized file of more than 5000 expert names and their field of expertise.

In the case of a candidate who has never served on an IAEA project before, his or her curriculum vitae is sent to the relevant technical officer for evaluation and classification for the experts roster. Suitable candidates are then submitted to recipient countries for their approval, according to UNDP and government procedures. It is usually at this stage that the Experts Section informs the recipient government of the dates on which the expert would be available to carry out the proposed assignment.

Subject to official clearance by the governmental authorities concerned, or after receipt of such a clearance, depending on time available to complete recruitment arrangements, the Experts Section makes an offer to the expert. This might include a modest honorarium for the services to be delivered, as well as per diem rates and travel expenses. At this stage, the expert receives relevant information regarding visa and medical requirements, as well as briefing and reporting instructions.

Once appropriate clearances have been received and the offer is accepted by the expert, a contract is prepared between the expert, or the expert's permanent employer or sponsoring organization, and the IAEA. There are several types of contracts, depending on the function of the expert and the duty station. The average duration of a contract is two weeks; few contracts are longer than one month. For projects of a more lasting nature, 1-year contracts, with possibility of extension, might be offered to some experts.

Once the Experts Section has informed the local UNDP office and the counterparts of the expert's travel and related itinerary, its major work is done. Now it is up to the expert and the counterpart organization to make the mission a success. Due to the short contractual time, work typically begins at once. Direct communication between the expert and national counterparts usually clarifies the objectives and work plan before the trip begins. Both sides then can concentrate on the work at hand as soon as the expert arrives. Often, one expert assignment can only cover a small aspect of a technical co-operation project. Team and follow-up missions are characteristic for larger projects which, in the end, might have a stronger impact on national development.

At the end of a mission, experts file a detailed report with the IAEA. This helps assess the project's progress, identifies problem areas, and recommends action that needs to be considered.

## Future directions

The IAEA's technical co-operation programme continually endeavors to strengthen its role as a catalyst and a vehicle for innovation in the provision of technical assistance, and to increase its responsiveness to the evolving needs of the developing world. During the past 2 years, it has been focusing on a policy review to stress nuclear technology transfer at the national level. From past work, basic infrastructures have been created in many countries upon which national development can now build. In this context, the further development and strengthening of radiation protection laws and procedures will play a major role. Additionally, model projects have been launched that are more closely oriented towards national development plans and the practical needs of end users.

Through these avenues and others for effective technical co-operation, "experts without frontiers" will continue to play a key role. They stand to remain a basic component for the transfer of nuclear science and technology to developing countries. ❐