MOBILIZING THE SCI-TECH EDGE

CAN NUCLEAR TECHNOLOGIES DO MORE TO CUT POVERTY?

Experts are finding that faster progress against world poverty rests upon tools that most people view with a sceptical eye, and billions never get the chance to see.

These products and applications of science and technology can be more frightening than enlightening to people whose lives they benefit or seek to improve.

"People all over the world have high hopes that ...new technologies will lead to healthier lives, greater social freedoms, increased knowledge, and more productive livelihoods," states the *Human Development Report for 2001* of the United Nations Development Programme (UNDP). "At the same time, there is a great fear of the unknown. Technological change, like all change, poses risks."

The report sees a general public mistrust of "scientists, private corporations and governments -- indeed the whole technology establishment". The attitude is partly tied to visions of mad scientists or technological disasters. Yet even moreso, the fear is that new technologies will widen, not narrow, the gap between rich and poor, advantaged and disadvantaged.

Hasn't that been the story so far? Not exactly, the report finds.

A Hidden Story. The world is making progress against poverty, and science and technology have been keys to solutions along the way. Technological breakthroughs over the past century have led to unprecedented gains in advancing human development and fighting poverty. New medicines improved health and extended lifespans in Asia, Africa, and Latin America, for example. Breakthroughs in plant breeding and farming practices doubled world cereal yields over the past 40 years. And despite the lingering "digital divide" of communications technology, computers and the Internet have raised levels of education and access to information in significant ways just over the past decade.

But the "sci-tech edge" has yet to cut into poverty at its deeper levels -- billions of the world's poorest people have never seen direct benefits from science and technology.

Attacking Poverty. The situation is prompting urgent calls for more broad-based and concerted action to attack poverty.

More effective transfer of technologies to developing countries is needed, supported by sound policies for their safe and effective management, the *Human Development Report* states. Right now, few developing countries are on track to meet anti-poverty goals set at the United Nations Millennium Summit on development and poverty that science and technology can help them to achieve. The majority are far behind or slipping.

The depth of problems and challenges is sobering. In updating its *World Development Report* in April 2001, the World Bank reported that almost half of the world's population, or 2.8 billion people, live on less than two dollars a day, with more than one billion living on less than a dollar a day. Children starkly bear the consequences. Five times as many children die before the age of five in the poorest countries than in richer ones. Up to half of all poor children suffer from eating too little food.

"This destitution persists even though human conditions have improved more in the past century than in the rest of history," the report notes. "Global wealth, global connections, and technological capabilities have never been greater. But the distribution of these global gains is extraordinarily unequal."

In proposing a broader, more comprehensive attack on poverty, the World Bank stressed the need for urgent cooperative action at all levels to give more people the opportunities to lift themselves from deprivation.

Mobilizing the Sci-Tech Edge. Among those advocating more innovative solutions to help the world's poorest countries is Prof. Jeffrey Sachs, Director of the Center for International Development at Harvard University in the

USA, and an invited speaker at the IAEA's Scientific Forum in September 2001 on nuclear technologies for development. *(See box.)* Along with Center colleagues and the World Economic Forum, he regularly tracks development trends through the *Global Competitiveness Report* series and other publications.

Writing for a wide audience in *The Economist* in August 1999, he strongly urged the mobilization of global science and technology in the fight against poverty, especially in the poorest countries. Conditions in these Highly Indebted Poor Countries (HIPCs) -- predominately in Africa and home to more than 700 million of the world's poorest people -- are worsening dramatically, he says. For myriad reasons, he points out, the technological gains in wealthy countries "do not readily diffuse to the poorest ones." Political and economic barriers stand in the way, but the bigger obstacle, he argues, is that technological research and development (R&D) are largely geared to solving problems of richer countries.

"We urgently need new creativity and a new partnership between rich and poor," he says. The overriding need is to mobilize science and technology against the crises of public health, agricultural productivity, environmental degradation and demographic stress confronting these countries. International organizations need to do better, he says, in the vital roles of identifying global priorities in health and agriculture, and of mobilizing R&D towards globally desired goals.

SCIENTIFIC FORUM ON NUCLEAR TECHNOLOGIES AT IAEA GENERAL CONFERENCE

The 45th regular session of the IAEA General Conference opens in Vienna on Monday, 17 September, to review the Agency's programmes and set future directions for global nuclear cooperation. Items on the provisional agenda include measures for further strengthening activities related to technical cooperation, safeguards, safety, and nuclear science, technology and applications.

A Scientific Forum on 18-19 September will bring together leading international experts in fields of science, technology, and human development. Entitled "Serving Human Needs: Nuclear Technology for Sustainable Development", the Forum features five topical sessions, including a panel discussion of leading experts. The other four sessions will focus on science, technology, and development; the promotion of food security; the management of water resources; and the improvement of human health.

Specific subjects include campaigns against the tsetse fly in Africa; the global impact of induced mutations in plant breeding; national strategies for improving water resources management; arsenic contamination of groundwater; neonatal screening for treatable congenital disorders; radiotherapy for cancer treatment; and the use of isotopes for improving human nutrition. IAEA Director General Mohamed ElBaradei will deliver an opening statement, and keynote addresses are scheduled from Mr. Jeffrey Sachs, Professor of International Trade at Harvard University; and Mr. Jose Vargas, former Brazilian Minister of Science and Technology. A concluding panel discussion summing up the Forum will be moderated by Ms. Margaret Catley-Carlson, Chair of the Global Water Partnership and past President of the Canadian International Development Agency and Population Council.

The Nuclear Challenge. For the IAEA -- at its core a science and technology agency -- the growing recognition of the sci-tech edge could open new opportunities in applying nuclear technologies to serve human needs. Many of these technologies already make distinct and valuable contributions. Just how much they can contribute to economic growth and development is most evident in rich countries that have developed them. A 1997 study in the United States, for instance, found that peaceful nuclear technologies in medicine, industry, energy, agriculture, and other fields generated $421 billion annually for the US economy, including more than four million jobs.

Many of these technologies go unnoticed in their applications around the world. Some have been key pieces of technological breakthroughs behind the recorded progress in development. They have been instrumental components, for example, of the "green revolution" in agriculture through more productive crop varieties that plant breeders developed using radiation technologies, and in raising standards of health care through nuclear medicine and radiation techniques benefiting physicians and patients. They keep contributing -- in fields ranging from child nutrition to clean energy production -- to Agenda 21's plan of sustainable development, which comes up for review at the Earth Summit in South Africa in September 2002. *(See related articles and the supplement inside this edition of the IAEA Bulletin.)*

Like other sci-tech applications, however, nuclear technologies have made too

WEB LINKS

- Organization of African Unity, Summit Documents, http://www.oau-oua.org
- United Nations Economic and Social Council, July 2001 High-Level Session http://www.un.org/esa/ coordination/ecosoc
- Center for International Development, Harvard University, USA http://www.cid.harvard.edu
- *World Development Report 2000/2001*, World Bank http://www.worldbank.org
- *Human Development Report 2001*, United Nations Development Programme http:// www.undp.org
- *IAEA Annual Report for 2000*, International Atomic Energy Agency http://www.iaea.org/worldatom
- "*Helping the World's Poorest*", Jeffrey Sachs article in *The Economist* http://www.cid.harvard.edu/cidsocialpolicy/sf9108.html

little headway in the poorest countries to help single out and attack the roots of poverty.

Supporting Initiatives. Some hopeful signs point to new directions. They could lead to more success for anti-poverty initiatives to which nuclear and other technologies can significantly contribute.

One far-reaching initiative, in Africa, aims to cut one of the most devastating lifelines of rural poverty, one responsible for regional losses estimated at $4.5 billion a year.

Leading the initiative is the Organization of African Unity (OAU). At the OAU's July 2000 Summit in Togo, Africa's leaders agreed on a plan of action to free the continent from deadly human and animal diseases transmitted by tsetse flies. For as long as anyone remembers, they have infested agricultural areas in countries of sub-Sahara Africa, placing more than 60 million people in 37 countries at risk of "sleeping sickness". As importantly, they infect cattle herds with the disease of trypanosomosis, so severely cutting livestock populations that farming families must keep working the fields by hand. Not surprisingly, agricultural productivity on these otherwise fertile lands is the lowest in the world, and people living there are among the poorest.

Technologies exist to make a sizeable difference. They include tools to suppress fly populations and a radiation-based technology called the sterile insect technique designed to eradicate them. The integrated technologies have a solid track record against many pests, including the Mediterranean fruit fly in North America and the tsetse fly on Zanzibar Island, gained through control and eradication campaigns supported by the IAEA and Food and Agriculture Organization (FAO) of the United Nations. Efforts now have intensified to create tsetse-free zones in other countries, including Ethiopia.

The challenge on mainland Africa is stiff, demanding long-term commitment and support. Is it out of reach?

"Freeing Africa from the grip of tsetse is an achievable goal," says Mr. Qian Jihui, IAEA Deputy Director for Technical Cooperation and a strong proponent of applying nuclear technologies against poverty. "We urgently need to bring together the resources to support African countries in their efforts. The sooner the tsetse threat is removed, the sooner we can cut a major root of rural poverty."

Recognition is growing. The United Nations Economic and Social Council (ECOSOC) in July 2001 called for international organizations and the world community to fully support the OAU tsetse campaign. In his report to the Council, UN Secretary-General Kofi Annan emphasized the importance of mobilizing support for the initiative, and the joint work of organizations to bring together technologies and expertise.

"Agriculture is fundamental to sustainable development in Africa because of the size of the agricultural sector and the extent of rural poverty, hunger, and malnutrition," the Secretary-General said. In singling out the FAO/IAEA's efforts for tsetse-free zones in sub-Sahara Africa, he pointed out that such collaborative work "could make a difference to food security and poverty reduction."

Will more support be garnered? If it is, proven technologies could lead to a pioneering breakthrough -- one that enables the most needy countries to cut poverty with a sci-tech edge they have long been missing.--*Lothar Wedekind, IAEA Division of Public Information.*