Science in the South

The International Centre for Theoretical Physics (ICTP) in Trieste, Italy, turned 40 this October. It is an occasion for some reflection. The scientists who created ICTP, notably the Nobel Laureate Abdus Salam of Pakistan, were motivated by a goal that is simple to proclaim but difficult to fulfill: to advance the level and role of science in the Southern world by overcoming the debilitating isolation of scientists who work there.

This goal is more important now than ever before. No country today can survive and prosper in isolation, and economic prosperity is tied to scientific development. The building of scientific capacity needed everywhere is thus in our collective interest and is a shared responsibility. Forty years on, however, we still live in a world in which a majority of scientists, scientific discoveries, publications, and patents come from developed countries. So, what has ICTP accomplished?

ICTP has been involved, to different degrees, with the careers of some 100,000 visiting scientists. They have come from nearly every country in the world, about half from developing countries. According to physics professor Edmund Zingu of Mangosuthu Technikon in South Africa, "Nearly every Ph.D. in East Africa has had an association with ICTP." The cadre of ICTP associates has established programs in their home countries, including Brazil, Benin, China, India, and Mexico. Some have turned to public service as ministers of science, members of parliaments, ambassadors, and in one case, the president of a republic. ICTP thus exemplifies that the best investment one can make is in human capital: the individual scientists.

Building scientific capacity worldwide is a shared responsibility.

But ICTP is keenly aware that its efforts are small relative to the needs. These needs are tremendous even in countries that have made some strides (at least progress has been spotty). Regrettably, countries in Africa and the Middle East have either stood still in scientific progress or actually regressed. The challenges remain daunting. The critical question is how to proceed.

We can draw one lesson: Among the diverse ways in which ICTP has attempted to fulfill its mission, the key ingredient for success has been the followthrough. Where we have been able to keep sustained contact with our associates, the success has been greater. Because ICTP is small, large-scale success requires similar commitment from more people and institutions. Greater exchange within the South between the more and less scientifically proficient countries is a case in point. ICTP has established such links by creating networks, cooperative programs, regional schools, and affiliate centers in the South. Recent efforts by Brazil, China, and India to provide fellowships to promising scientists under a program administered by ICTP's sister organization, the Third World Academy of Sciences (TWAS), suggest that programs for South-South cooperation are finally taking off.

The involvement of scientific institutions in the North is the next crucial element. Here the goal should not be the transfer of technology, but the creation of scientific capacity in each country for generating appropriate solutions for problems involving public health, energy sources, agriculture, ecology, the proper use of environmental resources, and basic education. Other international institutions in Trieste have been working for this goal in diligent partnership with ICTP.

Lasting changes can occur if nations, not just individual scientists, choose to embrace science as an essential part of their national agenda. We must thus move beyond the scientist-to-scientist strategy and become more involved in changing institutions in the developing world. ICTP is increasingly engaging ministries of science and technology in policy discussions, encouraging governments to provide sustainable funding for science. At the same time, we are working in partnership with science institutions in the developing world. This October, ICTP signed an agreement with Brazil's National Council for Scientific and Technological Development (CNPq) to fund four scientific workshops each year in Latin America.

Building scientific capacity is different from instilling a sense of quality. Anchoring quality by providing a well of excellence from which to draw upon will continue to be ICTP's mission and responsibility. That's a full agenda for the next 40 years.

K. R. Sreenivasan

K. R. Sreenivasan is the Abdus Salam Honorary Professor and director of the Abdus Salam International Centre for Theoretical Physics in Trieste, Italy.

Published by AAAS