

(Physics, 1979) and Ahmed Zewail, an Egyptian (Chemistry, 1999). Both carried out their research outside Islamic countries. Today's Muslim societies have generated few scientists of international repute.

Take science education. Many of the Arab OIC member countries, including Malaysia, have fairly good undergraduate education systems, but are weak at the postgraduate level. Of the world's top 500 universities, only two are in OIC member states (both in Turkey). The OIC's 1.3 billion inhabitants are served by less than 600 universities, most of low standard.

Making way

But progress is being made. Turkey, for example, ranked 46th in the world in terms of output of scientific papers seven years ago; it jumped to 22nd place in 2002, according to Philadelphia-based science information specialist, Thomson ISI. The international isolation of Iran over the past two decades has generated a strong sense of self-reliance and autonomy from the West — and a resulting increase in investment in science and technology.

Since 1999, Pakistan has increased science spending 60-fold, and funding of higher education 12-fold. Funds have been released for 1,500 PhD students to be trained annually at home, and a further 300 abroad. As a result, the annual PhD output should increase from about 200 this year to 1,200–1,500 by 2009.

A nationwide digital library of 20,000 journals has been launched, providing free access for all educational and research institutions. There is also a new scheme to attract 1,500 top researchers back from overseas to work in Pakistan during the next five years. In addition, the cabinet has launched plans to reinforce research and make science a priority of long-term policy at cabinet level.

Turkey leads OIC states in terms of annual output of research papers with 6,393 in 2001, then Egypt at 2,498, followed by Iran² — which has tripled its output from 501 in 1996 to 1,830 in 2002. During the period 2001 to 2003, the sharpest increase has come from Pakistan, with a 40% increase from 636 to 890. This is a result of a system introduced in 2002 that provides researchers with an opportunity to more than quadruple their earnings if they increase the numbers of their papers published in peer-reviewed journals.

Global effort needed

These pockets of improvement are encouraging. But the fact remains that OIC countries are home to three-quarters of the world's fuel reserves and a quarter of its other natural resources. How do we reconcile this richness in resources with our lack of socio-economic development? Our backwardness in science and technology and higher education is part of the answer.



Standing up for science: Abdus Salam (above, left) and Ahmed Zewail (above), are the only Nobel laureates to come from Islamic countries. Ekmeleddin Ihsanoglu (left) has vowed to improve relations in international research. Pakistani president, Pervez Musharraf has revitalized spending on science.



So, apart from initiatives by individual countries, what can be done by Islamic nations as a group to improve the situation? Two bodies exist to promote science in Islamic states: the Islamic Educational, Scientific and Cultural Organization (ISESCO), and the OIC Standing Committee on Scientific and Technological Cooperation (COMSTEC).

At the COMSTEC general assembly in February 2002, Atta-ur-Rahman proposed the creation of a multi-billion dollar Pan-Islamic Fund for the development of science and technology in OIC states. The decision was referred to the Islamic Summit Conference for authorization, who, in Kuala Lumpur in 2003, deferred their decision for further deliberations and consultations. The proposal is now expected to go before a subcommittee before its resubmission to the next Summit meeting, to be held in Senegal, 2006.

In May 2002, COMSTEC proposed that the Islamic Development Bank come forward with at least US\$1 million annually to upgrade some selected research institutes in the OIC member states to international standards of excellence. The proposal envisaged enabling bright young scientists from OIC regions to train in key areas, such as biotechnology, material sciences, pharmaceuticals

and bioinformatics. Due to the paucity of funds, the bank has agreed to earmark only US\$450,000 at present.

How can the West help to strengthen science in Islamic countries? The Inter-Academy Panel on International Issues — an alliance of 90 scientific academies — organized a workshop in 2003 in Trieste, Italy. This brought together research ministers and heads of scientific societies to promote the creation of more independent scientific academies in Muslim countries, with the goal of boosting both research and independent scientific advice available to governments³.

A follow-up meeting in Islamabad in March this year resulted in the creation of the Network of Academies of Science in countries of the OIC.

To the future

Science is a truly global activity, and although the OIC and COMSTEC have their role to play, encouraging bilateral and international cooperation is the key to progressing towards enlightened moderation in the Islamic world.

This is just a beginning in the task of redressing centuries of neglect by our political leaders. For the policy-makers, the writing is on the wall — there is a need to develop a knowledge economy, face the challenges of the new world order and spend at least 1% of GNP on strengthening science and technology. The OIC member states must respond to all these challenges.

Encouragingly, Ekmeleddin Ihsanoglu — appointed last June to head the OIC for four years — has pledged to improve cooperation between researchers from Muslim countries and others worldwide. Ihsanoglu is also president of the International Union for the History and Philosophy of Science. He needs to muster the necessary political and financial support to revitalize science and technology for socio-economic development in OIC member countries.

As we continue to dream, struggle and search for a happier and more prosperous future, we share this new awareness among Islamic states with the global scientific community. We urgently seek your much-needed cooperation and interaction. In the place of the clash of civilizations, our collective wisdom and efforts can help heal wounds and guarantee a safer and better world for those who will follow us.

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1. Human Development Report (UN Development Programme, New York, 2004); <http://hdr.undp.org/reports/global/2004>.
2. Science Watch 14, (2003); www.sciencewatch.com/nov-dec2003/sw_nov-dec2003_page1.htm.
3. Butler, D. *Nature* 422, 101–102 (2003).