



International Council for Science

In the second of *International Innovation's* two-part interview with **Professor Deliang Chen**, Executive Director of ICSU, he discusses the Council's successes over the past four decades and outlines the challenges facing scientific research in coming years

How does ICSU ensure that it supports scientific networks and facilitates the participation of scientists from developing countries?

Strengthening support for developing countries is a priority for ICSU. There is need for trained and knowledgeable people in all regions, and we have to develop networks to build capacity, share experience, and move away from the problems associated with poor funding, deficient infrastructures and communities operating below a critical mass. One important development for ICSU has been the relatively recent establishment of its Regional Offices. We now have three, based in Kuala Lumpur, Pretoria and Mexico City and serving Asia and the Pacific, Africa, and Latin America and the Caribbean respectively. These Offices are able to set their own programme priorities and respond to the needs and potentials of the countries they serve, while working within the framework of ICSU's Strategic Plan. They are setting up partnerships with like-minded regional organisations and institutions, and I hope, increasingly moving towards South-South cooperation. ICSU no longer wants to be viewed as an international organisation working out of Paris.

What role did the organisation play in the International Polar Year 2007-2008 (IPY)?

I am pleased to say that ICSU's role was pivotal in the establishment and implementation of this programme. IPY was one of the most ambitious coordinated international science programmes ever attempted. Over 160 projects involving thousands of scientists, from over 60 countries and a wide range of research disciplines, set out to discover more about the Polar Regions and their critical influence on the rest of the planet. The Year, which was co-sponsored by ICSU and the World Meteorological Organization (WMO), generated enormous amounts of original research, attracted significant funding, and the results from the research will continue to become available over the coming years and will play an important role in ensuring the vitality of the Polar Regions. The collaboration among many nations and among many scientific disciplines was critical to the programme's success, and it is crucial that the energy and partnerships that converged in IPY are sustained over the long term. IPY was particularly successful in terms of its educational and outreach dimensions, and this is something that ICSU will seek to emulate in the future with its other initiatives.

To what extent are international collaboration and a holistic, multidisciplinary approach to research essential for progress? Has the consolidation of knowledge, and the interoperability of research strategies been lacking up to now?

In recent years there has been near-universal recognition that many of the major challenges facing society demand a holistic scientific approach. They are complex, do not usually respect our artificial boundaries and frontiers, and need the talents of the broad scientific research community if they are to be understood and addressed. We are

convinced that ICSU is well placed to bring these various talents together and to facilitate interdisciplinary approaches for their resolution. And here I am not just talking about fostering cooperation between the disciplines of the natural sciences. Increasingly we are working with important partners such as the International Social Science Council (ISSC) to extend and broaden the approaches we take. The ISSC is now one of our most regular and valued partners.

I would add one thing here: that to the interoperability of research strategies I would add the absolute need for interoperability where observation, data handling and information management are involved. This is of great concern to ICSU, and is set to feature in our forthcoming Strategic Plan.

Global environmental change has been a key area for ICSU for more than 40 years. What are the four main programmes that are co-sponsored by ICSU and what necessary function do they perform?

ICSU was at the heart of the planning that led to the establishment of the four main programmes: the World Climate Research Programme, WCRP (created 1980), the International Geosphere-Biosphere Programme, IGBP (1986), DIVERSITAS: an International Programme of Biodiversity Science (1991) and the International Human Dimensions Programme on Global Environmental Change, IHDP (1996). In each case the programme has benefited from co-sponsorship with other international organisations. They each have an International Programme Office responsible for their coordination, and have governing bodies made up of internationally renowned scientists serving in their personal capacity. The programmes have been hugely successful, and have succeeded in leveraging billions of dollars of new research funding over the years. I hasten to add that this is not money that flows through ICSU; rather it is awarded directly to projects and institutions that are contributing to the global programmes. ICSU for its part is content to provide the relatively modest seed funding necessary for such major initiatives to first see the light of day. The four programmes described above together launched an Earth System Science Partnership (ESSP) in 2001 to facilitate Joint Projects and Integrated Regional studies.

Two new Interdisciplinary Bodies have been set up within the last couple of years, based on our successful model; these are the Integrated

ANALYSIS

Research on Disaster Risk (IRDR) programme which addresses the challenge of natural and human-induced environmental hazards, and the Ecosystem Change and Society (PECS) programme, to foster coordinated research to better understand the dynamic relationship between humans and ecosystems.

ICSU, co-sponsors and representatives of the interdisciplinary programmes themselves have, with the help of interested scientists and institutions worldwide, been conducting what we have chosen to call a 'Visioning process'. Through this very much inclusive process, we have sought to identify the 'grand challenges' facing Earth System Science during the years and decades ahead. Behind this process is the belief that 'business as usual' in terms of international environmental science is not an option; instead, new ways of managing scientific research must be found and put into practice. This Visioning process has latterly merged with one conducted by the group of major global change funders – the so-called Belmont Forum – of which ICSU is a founding member. Together, I am confident that we can bring about a reorientation towards a new research set-up that better allows science and society to address the needs of decision makers and citizens at global, regional, national and local scales

What function does the Universality of Science Principle perform and how does it aid the freedom of movement and communication?

The Principle of the Universality of Science is laid out in our Statutes; adherence to which is a condition of ICSU membership. The Principle embodies freedom of movement, association, expression and communication for scientists as well as equitable access to data, information and research materials. By actively upholding this principle, ICSU opposes any discrimination on the basis of such factors as ethnic origin, religion, citizenship, language, political stance, gender, sexual orientation or age. At the same time, there is another side to the coin; important responsibilities at all levels for scientists are inherent in these freedoms, namely to carry out and communicate scientific work with integrity, respect, fairness, trustworthiness and transparency. ICSU's Committee on Freedom and Responsibility in the conduct of Science (CFRS) serves as the guardian of the Principle, acts as the 'corporate memory' and international reference point on these issues, and takes action as necessary in relation to breaches of Universality. I believe we can be justifiably proud of the work that has been carried out by this Committee and those preceding it over the years.

What challenges would you say the ICSU is currently facing, and what major difficulties have you overcome in the past? In what way do you anticipate the ICSU evolving?

I have described how ICSU is meeting the challenge presented by earth system science through our Visioning process. I should also mention another: a Foresight exercise that the Committee for Scientific Planning and Review (CSPR) is carrying out, assisted by the ICSU Secretariat. Using the alternative scenario approach, we are assessing how ICSU can prepare itself for the future and best serve science (and society) in doing so. It's an exciting process, and one to which we are fully committed.

Amongst the recent achievements enabled by ICSU what would you highlight for special attention?

This is always an invidious business, but I will name just three. The first is the extremely successful International Polar Year, which showed what a well supported, well targeted programme with enthusiastic champions can achieve in a relatively short time. The second is the identification of future Grand Challenges in Earth System Research for Global Sustainability through the visioning process. The process has generated a lot of momentum by engaging the international scientific community to explore options and propose steps to implement a holistic strategy for Earth system research. The implementation of the outcomes of this process will involve the full range of sciences and humanities and actively engage stakeholders and decision makers. The third is the setting up of our Regional Offices that serves to 'open up' ICSU to the many parts of the world of science that may have hitherto felt a little left out of the whole enterprise.

Finally, your thoughts on investment; do you believe there is sufficient funding to tackle the undeniably huge environmental issues we face as a global community? Is there scope for commercial enterprise to help in shifting the way we prioritise environmental objectives?

You probably would not expect me to say that I was satisfied with the level and nature of science funding, especially faced as we are with huge, complex issues such as climate change and loss of biodiversity, and I shall not do so. As I have said previously, we are discussing with the major funders, how international collaborative scientific research can best position itself to optimise the resources that are available. There is an old adage which says 'good research can always find funding', and to a great extent this is true. We, the scientific community, simply need to be better organised.

You raise the issue of private sector funding. ICSU is probably not alone in believing that it could do more in this area, so long as the obvious safeguards are put in place. We are certainly seeking to develop our links with foundations, and major national and international enterprises regarding research funding.

