ICSU
International Council for Science

strengthening international science for the benefit of society

Draft Strategic Plan for the International Council for Science 2006-2012

Draft of the ICSU Committee on Scientific Planning and Review (CSPR) for consultation

About ICSU (inside front cover)

Founded in 1931, the International Council for Science (ICSU; the name was changed from the International Council of Scientific Unions in 1998, but the acronym has been maintained) is a non-governmental organization representing a global membership that includes both National Scientific Bodies (103 Members) and International Scientific Unions (27 Members). Through this international network, ICSU plans and coordinates interdisciplinary research to address major issues of relevance to both science and society. To this end, a number of Interdisciplinary Bodies have been established to address major interdisciplinary and international activities relevant to the mandate of ICSU. In addition, the Council actively advocates for freedom in the conduct of science, promotes equitable access to scientific data and information, and facilitates science education and capacity building.

The Council acts as a focus for the exchange of ideas, the communication of scientific information and the development of scientific standards. The ICSU family[1] organizes scientific conferences, congresses and symposia all around the world—in excess of 600 per year—and also produce a wide range of newsletters, handbooks, learned journals and proceedings. ICSU also helps create international and regional networks of scientists with similar interests and maintains close working relationships with a number of intergovernmental and non-governmental organizations.

Because of its broad contact with thousands of scientists worldwide, ICSU is increasingly called upon to speak on behalf of the global scientific community and to act as an advisor in science matters ranging from ethics to the environment.

One of the strengths of ICSU is its governance structure, which has developed over time to ensure transparency and accountability, with a minimum of bureaucracy. The ICSU Secretariat is based in Paris, where a small professional team (12 people in 2004-05), ensures its day to day planning and operations, under the guidance of an Executive Board. The Board is made up of 14 scientists, representing different countries and disciplines, elected by the General Assembly of all Members, which is convened every three years. A small number of standing Policy Committees assist the Executive Board in its work. ICSU's activities depend to a large extent on the voluntary contributions of scientists from around the world who are brought together in these Policy Committees or in various *ad hoc* expert groups

[1] The ICSU family encompasses the ICSU National and Union Members, ICSU Associates, Interdisciplinary Bodies and Joint Initiatives. For a full listing of these, see www.icsu.org. The National and Union Members as well as the Associates are also listed on the inside back cover and the Interdisciplinary Bodies and Joint Initiatives in Box 2.

Foreword

An independent assessment of ICSU, commissioned by its members, was completed in 1996 (see www.icsu.org). This has proven to be a significant landmark in the history of ICSU. It concluded that the Council has to plan ahead, define priorities, build on its strengths, make choices on what it will and will not do. In short, it concluded that ICSU needs a strategy.

A key outcome of that assessment was the establishment of a new Committee on Scientific Planning and Review (CSPR). Following approval of its preliminary plans by the ICSU General Assembly in 2002, this committee took the lead in developing the ICSU strategy: conducting a broad foresight consultation and managing three ambitious independent assessments of specific scientific areas. These priority area assessments considered both future needs and existing activities. The CSPR efforts have been complemented by several other major strategic reviews and planning activities carried out under the *aegis* of the Executive Board. [see Box 1]. A critical aspect of this overall planning exercise has been the close consultation with the entire ICSU membership.

Box 1. Strategic planning activities 2002-2005

- Report of the CSPR Panel for Review of the Committee on Science and Technology in Developing Countries (ICSU 2002a)
- Identification of Key Emerging Issues in Science and Society: an International Perspective on National Foresight Studies (ICSU 2002b)
- Foresight Analysis: Report of the CSPR (ICSU 2004a)
- CSPR Priority Area Assessments
  - Environment and its Relation to Sustainable Development (ICSU 2003A)
  - Scientific Data and Information (ICSU 2004c)
  - Capacity Building (ICSU 2005b)
- Science and Society: Rights and Responsibilities – a Strategic Review (ICSU 2005a)
- Universality of Science in a Changing World (position statement; ICSU 2004g)
- Advisory Group report on Science and Technology for Sustainable Development (ICSU-ISTS-TWAS 2005)
- Working Group on Energy and Sustainable Societies (ICSU 2004b)
- Scientific Framework for the International Polar Year 2007-2008 (ICSU 2004d)
- Working Group on Basic Research (position statement; ICSU 2004f)
- Review of membership and structure (no formal report available)

Each of these activities has resulted in its own published report or position statement. All reports are available at www.icsu.org and include many important and detailed recommendations that are not reproduced *per se* in the current overall strategy document.

Many leading scientists from all over the world have generously contributed to these various planning activities. The strategic plan presented here cannot possibly do full justice to the wealth of knowledge and ideas that were freely given for this monumental exercise. ICSU remains indebted and the best response that we can give is to ensure that the strategy itself is implemented to the best of our ability and the benefit of both science and society.

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Executive Summary

Note To be added once the main report has been considered by the ICSU family and focussing on the key goals and new initiatives described in Part II.

Part I: A Strong Foundation in a Changing World

1. The Evolving Context for International Science

ICSU is first and foremost a scientific organization, whose unique strengths are its independence and broad coverage of scientific disciplines and nations. Strengthening science for society means being aware of the emerging developments in science and the potential of science to address societal needs. It also means being able to identify these needs as they already exist or newly arise and formulate them into scientific questions. Changes in the practice of international science and developments within society need to be considered together in defining future priorities for ICSU.

1.1 The practice of international science

The end of the 20th century has been a golden period for science with unprecedented progress in many areas. Aside from the wealth of new scientific knowledge, what are the major trends that are influencing the practice of science as a whole? What does the world of international science look like now compared to a couple of decades ago?

The large majority of financial support for science continues to be at the national level. The USA, Japan and Europe continue to dominate in terms of national investment and performance. Whilst several countries such as Brazil, China and India are making rapid progress, others such as the former Eastern block countries are struggling to maintain previous strengths. There remain a large number of poorer countries, where investment in science is negligible. These inequalities are reinforced by a net outflow of trained scientists from poorer to richer countries.

Regional initiatives, particularly the development of a transnational European Research Area, are having a significant effect on the competitive landscape for science. The New Partnership for African Development (NEPAD) may provide the impetus for a similar, and much hoped for, cooperative effort in that region. Whilst such regional alliances are largely dictated by economic interests, they are having a considerable impact on the funding and structuring of science.

Despite the predominance of national funding and strong competition among countries, science now, more than ever before, is an international endeavour; the exchange of scientific information and sharing of ideas across borders have been essential to the progress of science. However, the increasing ease of international exchange coupled with the recognition that many scientific problems, from climate change to AIDS, are inherently international in nature, also has led to a new global approach to research in many areas. Global research problems are invariably complex and require the collaboration of many disciplines as well as many countries. ICSU is uniquely positioned to challenge and prompt and organize the scientific community to address such issues and has, for example, been at the vanguard of global research on the environment.

Perhaps the most significant factor in shaping the practice of science over the past couple of decades has been the rapid development of information and communication technologies. Massive increases in computing capacity, coupled to the internet and the World Wide Web, have revolutionized science. There is more scientific data and information openly available than ever before. It is possible in principle, if not yet in practice, for any scientist anywhere in the world to access the most up-to-date scientific data and information at his or her desktop. Secondary analyses of data, and the combining of data from multiple sources, are opening up exciting new scientific horizons. Scientific publication practices are changing rapidly. However, as technology develops, so also does the need for that technology. There is a growing digital divide in science between those who do have access to digital information and data and those who do not; between poorer countries or institutions and their richer counterparts.

Scientific progress is leading to rapid innovation and development, with the result that the distinction between basic and applied research is less clear today than it was a couple of decades ago. As the industrial and commercial value of scientific applications has become more apparent, there is increasing pressure on funding agencies and individual scientists to justify their research in socio-economic terms. There is an increased emphasis on inter-disciplinary research both in response to scientific developments and the need to address complex problems. Traditional experimental approaches are being complemented, or even supplanted, by a more holistic systems approach to problem-solving in many areas of science. Complex system science is developing in many areas and this requires a new approach to both the teaching of science and the conduct of research.

At the outset of the 21st century the possibilities for science to benefit society are greater than ever before and these present many new challenges to the international science community and to ICSU.

1.2 The societal context

Science is embedded in society. Scientific knowledge and its application can lead to huge societal transformations; witness the discovery of electricity and penicillin or the development of the World Wide Web. At the same time, society itself has an enormous influence on science. Whether as a direct effect on funding decisions or policies on human stem cell research or as an indirect effect of urbanization or globalization, the agenda for science and perspectives of scientists are to a large extent determined by society.

Globalization of trade and the relative ease of international travel and information exchange have, in many ways, made the world a smaller place with shared needs and concerns. Whilst local contexts and problems are still very important and require local solutions, there is a rapidly developing global information society. There is increased awareness that what happens in one country or region cannot be considered in isolation but may have important implications for other countries. More than ever before, there is a need to establish international dialogue and consensus in many areas of scientific development, from genetically modified organisms and the conduct of clinical trials to the mitigation of natural hazards or global environmental change.

The developed world is moving from an era of industrial growth, based mainly on heavy engineering, to a new era of so called ‘knowledge-based economies’, with a premium on scientific knowledge and high technology developments in areas such as biotechnology, computing and nanotechnology. For many poorer countries the increasing emphasis on

knowledge as an asset presents both an opportunity and a threat; these countries are still playing catch-up with richer neighbours but have unique knowledge resources of their own and with the right policies and investment strategies, there is an opportunity for them to make rapid progress in terms of development.

The socio-economic divide between rich and poorer countries has become a major concern for global society as a whole. The UN Millennium Summit in 2000 defined a set of specific targets in the form of eight Millennium Development Goals and science has much to offer in helping nations to meet these targets.[2] The World Summit on Sustainable Development (2002) emphasised the concerted international efforts required to overcome inequalities between countries and ensure the future of planet Earth. Science itself has an enormous responsibility for providing solutions that integrate the environmental, economic and social aspects that are inherent in sustainable development.

Whilst science is universal, the global political situation and current concerns about terrorism are having a direct impact on scientific practice. Restrictions on visas, increased controls on the release of scientific information and proposed embargoes on collaboration with certain countries present very real threats to the universality of science. Universal access to scientific knowledge is an essential element in overcoming the inequities between countries.

In many countries, there is growing concern as to some of the uses of science. Science as a profession is still held in high esteem but individual scientists are increasingly expected to be accountable for the products of their work. They are being called upon to explain their research publicly and citizens want a greater say in the development of research agendas. The 'politicization' of academic research is a new phenomenon in many countries. As more and more scientific information becomes available, *e.g.* via the World Wide Web, the public interpretation of this and the portrayal of science in the media are demanding increasing attention from the scientific community. The public communication of science is an increasingly important aspect of science as a whole.

2. ICSU Past and Present

ICSU is one of the oldest international non-governmental organizations in the world. It arose out of the evolution of two earlier bodies known as the International Association of Academies (1899-1914) and the International Research Council (1919-1931). When ICSU itself was established in 1931, its membership consisted of forty National Scientific Members and eight International Scientific Unions. Despite the difference in numbers, members wanted to highlight the principle of all parties being equal partners and thus chose to call themselves the International Council for Scientific Unions. ICSU, as the Council came to be known, continued to grow and evolve, adding many new members in both categories. In 1998, Members agreed that the Council's broader composition and activities would be better reflected by modifying the name to the International Council for Science, while its history and strong identity should be recognized by retaining the existing acronym, ICSU.

The original *raison d'être* for ICSU, continuing on from its predecessors, was to provide a forum for scientists from different countries and disciplines to address issues of common concern. Over the years, ICSU began to address specific global issues through the development of Interdisciplinary Bodies [Box 2] and developed partnerships with other organizations, in particular various United Nations organizations. These partnerships have

[2] see http://www.un.org/millenniumgoals/

proved invaluable not only in ensuring additional support for specific activities but also in providing a crucial link between scientific research and policy-making. However, for many individual scientists, ICSU remains best known for the critical role it has played in relation to policy for international science, in particular in relation to the Universality of Science.

2.1 International research collaboration

Over the years, in response to the wishes of its Members, ICSU has established a number of Interdisciplinary Bodies to address international and interdisciplinary scientific priorities [Box 2]. Several of these bodies have played a central role in planning and coordinating major research programmes. The ability of ICSU to provide authoritative agenda setting through the planning of new major international research programmes is one of its greatest strengths. In addition to the planning, ICSU has also taken upon itself to provide efficient coordination of the programmes in order to ensure highest possible quality of the research. Interdisciplinary Bodies also provide a focus for synthesis of results and the communication of these to policy-makers.

2.1.1 The International Geophysical Year (IGY, 1957-1958)

The International Geophysical Year of 1957-1958, sponsored jointly by ICSU and the World Meteorological Organization, brought together 67 nations and over 60,000 individual scientists. The scientific accomplishments of IGY were numerous and included the discovery of the Van Allen Radiation Belts encircling the Earth, the first estimates of the size of Antarctica's ice mass, and confirmation of the theory of continental drift. It also directly stimulated at least one major geopolitical advance, the Antarctic Treaty System. Taking place at the height of the Cold War, the IGY demonstrated that even in tense political and economic times, scientists from around the world could work together for the betterment of society. Many of the structures and bodies that were developed by ICSU and its partners as a result of the IGY continue to play an important role in serving the scientific community to this day[3].

2.1.2 The International Biological Programme (1964-1974).

The biologists watched IGY with interest and set about developing the International Biological Programme. This programme brought ecology forward as a primary concern not only of the biological community but also of politicians and economists. The subject of the programme was defined as "The Biological Basis of Productivity and Human Welfare", and encompassed a worldwide study of biological production on land and in the oceans, and the use of new as well as existing natural resources. It also included studies of human adaptability to changing conditions and can be seen as a forerunner to the current global environmental change programmes.

[3] The Committee on Space Research (1958), the Scientific Committee on Antarctic Research (1958), and the Scientific Committee on Oceanic Research (1957) all arose out of the need for international scientific coordination in relation to IGY. Countries were also invited to establish and fund data centres to ensure that the archive systems set up during IGY would have long operational lives (Panel on World Data Centres established in 1968).

During the last years of the decadal International Biological Programme, the work inspired the planning for the intergovernmental Man and the Biosphere programme of UNESCO, which was launched in 1972.

Box 2. Current ICSU Interdisciplinary Bodies and Joint Initiatives

ICSU's Interdisciplinary Bodies focus on specific areas of international research that are of interest to all or many ICSU Members. Initially established by ICSU General Assemblies, these bodies are designed to become self-sufficient and independent in terms of day-to-day operations and financing. Several of these are designated as Joint Initiatives, when they include other sponsors than ICSU (see parenthesis below). Their roles vary depending on the area of science and on the related needs of the international science community, but usually combine operational and policy/advisory functions. Most Interdisciplinary Bodies have their own Secretariat.

ASSESSMENT BODIES
Millennium Ecosystem Assessment (MA; with many other institutional sponsors)
Scientific Committee on Problems of the Environment (SCOPE)

THEMATIC BODIES
Committee on Space Research (COSPAR)
Scientific Committee on Antarctic Research (SCAR)
Scientific Committee on the Lithosphere (SCL)
Scientific Committee on Oceanic Research (SCOR)
Scientific Committee on Solar-Terrestrial Physics (SCOSTEP)
Joint Visiting Scientist Programme of ICSU-TWAS-UNESCO-UNU/IAS

GLOBAL ENVIRONMENTAL CHANGE PROGRAMMES
An International Programme of Biodiversity Science (DIVERSITAS with UNESCO, IUBS, IUMS, and SCOPE)
International Geosphere-Biosphere Programme (IGBP)
International Human Dimensions Programme on Global Environmental Change (IHDP, with ISSC)
World Climate Research Programme (WCRP, with IOC of UNESCO and WMO)

MONITORING/OBSERVATION BODIES
Global Climate Observing System (GCOS, with WMO, IOC, FAO, and UNEP)
Global Ocean Observing System (GOOS, with WMO, UNEP and IOC)
Global Terrestrial Observing System (GTOS, with FAO, UNEP, UNESCO and WMO)
Integrated Global Observing Strategy Partnership (IGOS-P with many other institutional partners including space agencies)

DATA AND INFORMATION BODIES
Committee on Data for Science and Technology (CODATA))
Federation of Astronomical and Geophysical Data Analysis Services (FAGS)
International Network for the Availability of Scientific Publications (INASP)
Scientific Committee on Frequency Allocations for Radio Astronomy and Space Science (IUCAF)
Panel on World Data Centres (WDC)

2.1.3 The global change programmes (1980 – present)

In 1979 ICSU co-sponsored the first World Climate Conference, which led to the establishment in 1980 of the World Climate Research Programme by in partnership with the World Meteorological Organization, and the Intergovernmental Oceanographic Commission of UNESCO. At around the same time, and based on the early studies of its Scientific Committee on Problems of the Environment in the 1970s and early 1980s, ICSU initiated the planning of the International Geosphere-Biosphere Programme, which was launched in 1986. These early forerunners were supplemented by the establishment of an International Programme of Biodiversity Science[4] in 1991 and the International Human Dimensions Programme on Global Environmental Change[5], launched in 1996. Nowadays, these four Global Environmental Change research programmes are increasingly working together under the banner of the Earth System Science Partnership to promote international and interdisciplinary research in cross-cutting focal areas (carbon, food, water, and human health).

These programmes, together with the global observing systems, provide much of the scientific underpinning of the assessment conducted by the Intergovernmental Panel on Climate Change. The links between scientific research, global observations and integrated assessment of latest state of knowledge constitute essential elements in ensuring that science informs policy development in relation to the environment at both the international and national levels.

2.2 An international voice for science in a policy context

ICSU has a long-standing relationship with the United Nations system, not only in the implementation of scientific programmes, but also in the context of international policy.

The ICSU Scientific Committee on Problems of the Environment was established in 1969 to carry out integrated assessments of scientific knowledge on 'hot' topics. Its first report was commissioned by the UN Conference on the Human Environment (1972) and it continues to provide independent scientific advice to various intergovernmental agencies to this day. In preparation for the UN Conference on Environment and Development (1992), ICSU organized its own conference on an 'Agenda for Science and Development into the 21st Century'. As a result of the 1992 Conference, ICSU was invited by the UN to coordinate the input of the science community in the follow-up work through the UN Commission on Sustainable Development. In this capacity, ICSU, together with the World Federation of Engineering Organizations, was asked to contribute to the World Summit on Sustainable Development (2002). This included the publication by ICSU of a series of scientific reports on Science for Sustainable Development and the organization of a science forum at the summit. More recently still, ICSU has played an active role in ensuring that the voice of science was present at the World Summit on the Information Society (Geneva, 2003; Tunis, 2005).

[4] DIVERSITAS: An International Programme of Biodiversity Science was initially established in 1991 by the International Union of Biological Sciences, the Scientific Committee on Problems of the Environment, and UNESCO.

[5] The International Human Dimensions programme on Global Environmental Change was established in 1996 by ICSU and the International Social Sciences Council.

The UN organization that most clearly has a mandate for science is UNESCO, which has been a close partner of ICSU since its creation in 1946. Indeed, hearsay would have it that key ICSU personalities were instrumental in ensuring the inclusion of the 'S' in UNESCO. It was therefore only logical that when the UN organization decided to bring policy-makers and scientists together for the World Conference on Science in 1999, that ICSU should be asked to co-organize the event. This acted as an important stimulus for many related recent events, focussing on science policy and/or science for society in the international context. ICSU continues to be an active contributor to both UN and other international fora, where these can contribute to the Council's overall mission and the universality of science.

2.3 Universality of Science

One of the founding principles of ICSU, which is embodied in its statutes, is the Principle of the Universality of Science. This principle dictates that the practice of science should be equitable and without discrimination. All ICSU members are united by these ideals. A special Standing Committee on Freedom in the Conduct of Science was established in 1963 to help ensure Universality. This Committee played a key role in enabling scientific exchange between East and West during the Cold War period and many individual scientists are grateful for its work in resolving visa problems for attendance at international meetings. The cold war is now over but visa problems and embargoes continue to present a major challenge to the practice of science.

However, the Universality of Science is broader than visa issues and also encompasses other critical factors, such as the under-representation of women and the full inclusion of developing countries in international science. These issues are less easily addressed by a single standing committee but are integral to all of ICSU's activities both at the operational and policy level.

2.4 From international to national and vice versa

ICSU is not a funding agency or a governmental policy-making body. From the outset a major challenge has been to establish effective links with national systems for research, funding and policy-making. Whilst ICSU itself rarely gets directly involved in national discussions, both the National Members of ICSU and the national committees of the Scientific Unions and Interdisciplinary Bodies, provide critical access to national systems.

The importance of this linkage can be illustrated by taking the example of the Global Environmental Change programmes. The CSPR Panel on Environment and its Relation to Sustainable Development[6] estimated that only 0.5% of the total amount spent on global change research (ca. US$ 2bn per year) is used for the international planning and coordination activities. The Panel advised that this needs to be increased to 1%, which is still a very small fraction of the total funding. Most of the research funding in this area originates from national funding agencies and competitive grants schemes. Individual scientists seek funds to conduct the necessary research within the framework of ICSU research programmes. Despite their clearly acknowledged importance, many national and regional bodies are reticent about providing the necessary support for the global planning and coordination activities.

It is essential to link scientific research of the global environmental change programmes to monitoring, assessments and policy making. All are equally important for the sustainable

[6] The *ad hoc* expert panel established by CSPR to carry out the Priority Area Assessment of the Environment in Relation to Sustainable Development (ICSU, 2003a)

management of Planet Earth. National delegations taking part in, for example, the meetings of the Intergovernmental Panel on Climate Change and the Framework Convention on Climate Change need access to scientific information. National Committees of the global change programmes or ICSU National Members need to involve such delegation in a dialogue regarding the scientific underpinning of the assessments. This dialogue is necessary for the development of international policies as part of Multilateral Environmental Agreements. The appropriate structures are often in place at the international level but need considerable strengthening in a national context.

There are many other examples that could be cited, but learning from the past and looking to the future, the critical message for ICSU is that, in order to be effective, it must continue to nurture a mutually beneficial relationship with its own national representatives and to reach out more effectively to national and regional bodies. In planning new research initiatives, it is important that mechanisms be developed to foster a dialogue between the international planning and the national funding and policy-making. The International Funding Agencies for Global Change Research (IGFA)[7] is currently the only forum at the international level where such a dialogue exists. All of ICSU's international activities, both in the past and in the future, should be properly considered as a stimulus and/or a complement to what happens at the national level.

[7] The International Group of Funding Agencies is a group of representatives from national research funding bodies that was established to serve as an international platform to discuss funding for research on global environmental change.

Part II: Building for the Future

3. Future Vision and the Role for ICSU

When the new ICSU Committee on Scientific Planning and Review (CSPR) was established in 1998, one of its first tasks was to work with the ICSU family to articulate a future vision and mission for ICSU.

3.1 Vision

The long-term ICSU vision is for a world where excellence in science is linked to policy making and socio-economic development in all countries across the world. In such a world, universal and equitable access to scientific data and information is a reality and all countries have the scientific capacity to use this and to contribute to generating the new knowledge that is necessary to establish their own development pathways in a sustainable manner. ICSU has a major role to play in leading the global science community, implementing new scientific initiatives and engaging with policy-makers and other sectors of society to help realize this vision.

3.2 Mission

ICSU's mission is to strengthen international science for the benefit of society. To achieve this, the Council mobilizes the knowledge and resources of the international science community to:

- Identify and address major issues of importance to science and society;
- Facilitate interaction amongst scientists across all disciplines and from all countries;
- Promote the participation of all scientists - regardless of race, citizenship, language, political stance or gender - in the international scientific endeavour;
- Provide independent, authoritative advice to stimulate constructive dialogue between the scientific community and governments, civil society and the private sector.

The present strategic plan is organized around these four core themes (sections 4-7, ahead).

4. Addressing Major Issues: Planning and Coordinating Research

ICSU's past successes in developing scientific programmes have depended on the timely identification of emerging scientific issues that require a multidisciplinary and international approach. This first stage of issue identification has generally, to date, been done opportunistically and has been very much dependent on the foresight of a small number of

individuals. Opportunism and individual leadership are at the root of many scientific breakthroughs and need to be incorporated into any process of planning for the future. The challenge for ICSU is to develop a strategy based on the best current estimate of future priorities and to ensure that effective mechanisms are in place to identify and accommodate new opportunities as they arise.

4.1 Environment

ICSU has an extensive environment portfolio, which was subject to review as part of the Priority Area Assessment of the Environment and its Relation to Sustainable Development (ICSU 2003A). This forward-looking Panel assessment highlighted the need to strengthen links between environmental research, monitoring/Earth observation and integrated assessments to inform decision-making. ICSU is a major global player in each of these areas [see Box 2] but needs to assume responsibility for ensuring better integration of the four components in the coming years. The Panel concluded that greater efforts have to be made to increase the involvement the social, health and engineering sciences, which are not currently well-represented in the ICSU membership, in investigating human influences on environmental change and assessing the implications of such change for society.

Goal: to ensure a more coordinated and inclusive approach to research on the environment such that the necessary high-quality scientific evidence is made available to policy-makers; and to develop new international programmes in key areas.

Specific objectives

Several changes to existing ICSU structures will be implemented based on decisions by the 28th General Assembly (2005) to ensure a more streamlined [8]and coordinated approach to research on the environment:

- Research collaboration within the ICSU family and with other organizations on questions related to the environment will be strengthened to more fully include the social, health and engineering sciences.
- As part of its ongoing strategy development and quality assurance process, CSPR has initiated a performance review of the Human Dimensions Programme of Global Environmental Change, which will be carried out in 2005. Building on the Priority Area Assessment on Environment and its Relation to Sustainable Development, ICSU will conduct individual reviews also of the other three global environmental change programmes during 2006-2012. Special attention will be given to the development of the Earth System Science Partnership, which brings together the four global change research programmes to address issues that are integral to sustainable development.

In addition to the planning and coordination of international research, ICSU is also a sponsor of the three global observation systems (Global Climate Observing System, Global Ocean Observing System, and the Global Terrestrial Observing System). In 2003-2005, ICSU has been closely involved in the planning for the development of a coordinated Global Earth

[8] On the basis of the priority area assessment, it will be recommended to the General Assembly that several of ICSU's existing structures including the Advisory Committee on the Environment, the Federation of Astronomical and Geophysical Data Services and the Scientific Committee on the Lithosphere be disbanded or the responsibility for them be devolved to the relevant Scientific Unions.

Observation System of Systems. This has included taking the lead in identifying needs and exploring mechanisms for the collection global socio-economic data (ICSU 2004e), which are essential to the international research programmes.

- ICSU will play a major role in the scientific underpinning of the Global Earth Observation System of Systems (GEOSS).

In addition, two new research programmes will be developed as described below.

4.1.1 The International Polar Year (IPY, 2007-2008)

The Polar Regions are a unique barometer of environmental change and provide important insights into the health of the planet as a whole. The International Polar Year will be bipolar in focus, multidisciplinary in scope and truly international in participation. It will provide a uniquely comprehensive 'snap-shot' of measurements for comparison with previous and future records to inform our knowledge of changing planetary processes. A key objective will be the expansion of opportunities afforded by new information technologies to achieve previously unprecedented participation in polar science.

The ICSU Executive Board responded to overwhelming interest from scientists and polar and global research bodies by establishing an international planning group for IPY in February 2003. The scientific plan[9], which was developed in broad consultation with the scientific community, was approved by the Board in November 2004. A Joint Committee has been established with the World Meteorological Organization to oversee the implementation of this plan and coordination of activities.

Specific Objective

- ICSU will plan and coordinate IPY 2007-2008 in cooperation with the World Meteorological Organization.

4.1.2 Natural and human-induced hazards

Every year natural hazards, such as floods and earthquakes, are responsible for thousands of deaths and extensive damage to livelihoods and property. This is compounded by the increase in human-induced hazards, from pollution through to landslides triggered by deforestation. Whilst the prevalence of hazards varies from one region to another, it is invariably the poorest countries that are least well equipped to cope with their impacts and which suffer most. Like the hazards themselves, scientific research on hazards crosses national borders and is inherently international in nature. However a major challenge for the scientific community is to develop a truly global and interdisciplinary approach to the understanding, assessment and prediction of hazards. A key recommendation of the strategic planning exercise[10], was that ICSU should develop a new international programme in this important area. At the political level, the UN World Conference on Disaster Reduction (Kobe, 2005) provides a timely platform on which such a research agenda can be built.

[9] A Framework for the International Polar Year 2007-2008 (ICSU 2004d).
[10] Identified in both the PAA on the Environment in Relation to Sustainable Development (ICSU 2003A) and the Foresight analysis consultation exercise (ICSU 2004a).

Geohazards is a theme that is of considerable scientific interest to several Scientific Unions and was the major focus of the ICSU Committee on Disaster Reduction. Based on previous work of this Committee, a broad cross-disciplinary initiative on natural and human-induced hazards will be developed. The planning will build on existing strengths within the ICSU membership and Interdisciplinary Bodies, in particular the geohazards theme of the four Geo-Unions[11] and the geohazards theme of the International Global Observing Strategy Partnership.

Specific Objective

- An *ad hoc* Planning Group will be established to explore the development of a new international research programme on natural and human-induced hazards.

4.2 Sustainable development

Sustainable development is one of the most daunting challenges that humanity has ever faced. At all scales, from local to global, scientific and technological knowledge can help provide guidance and new solutions to the economic, social and environmental problems that make current development paths unsustainable.

Of the three pillars of sustainable development (social, economic, environmental), the environment is the one that has been most closely associated with ICSU to date. However, the four major global environmental change programmes are broadening their agendas and approaches to integrate economic, health and social sciences and have launched projects on carbon, water, food and human health, issues which underpin sustainable development. Additional complementary efforts focused primarily on local-scale analyses are necessary to enhance the real impact of science on development practices.

At the UN World Summit on Sustainable Development (2002), the Science and Technology Community, with ICSU responsible for the input from the science community, pledged to make science more policy-relevant through place-based research that integrates the three pillars of sustainable development and involves active participation of governments and civil society. (ICSU 2002c)

As part of the follow-up to this commitment, an independent *ad hoc* Advisory Group[12] was established to advise ICSU and other international organizations on the scientific research priorities for sustainable development. The general issues identified by this group as priorities for research and development efforts were:

- Resilience and vulnerability of social-ecological systems;
- Sustainable production and consumption
- Governance and institutions for sustainability
- The role of behaviour, culture and values in sustainable development

Addressing these themes effectively requires building new bridges among the natural, social, and engineering sciences. Integrating this broad array of perspectives and methodologies

[11] IUGG, IUGS, IGU, IUSS.

[12] The *ad hoc* Advisory Group was established to make recommendations to a consortium of partners consisting of ICSU, TWAS and the Initiative on Science and Technology for Sustainability. It produced a report, Harnessing Science and Technology and Innovation for Sustainability (ICSU-ISTS-TWAS, 2005)

presents a significant challenge for the future. Meanwhile, a continuing focus on sectoral sustainable development issues, such as energy[13], water and health, is also necessary.

ICSU has also been an institutional partner in the Millennium Ecosystem Assessment, an international four-year project that was designed to provide decision-makers with the latest scientific knowledge about ecosystem change and human well-being[14]. This project also helped build local capacities and networks for conducting integrated assessments in a local- to regional-scale context. Proposals are now being developed for a new set of activities that build upon this valuable local capacity and that further develop the type of place-based participatory research that is needed to inform sustainable development policies and practices.

Goal: Whilst working to build innovative new approaches for harnessing science for sustainable development, ICSU will also continue to promote research on specific sectoral issues, such as energy.

Specific objectives

- ICSU will explore, with partners, the creation of an ongoing mechanism for convening interdisciplinary, multi-stakeholder dialogues aimed at identifying the new scientific knowledge and technical capabilities that are most needed for meeting the challenges of sustainable development.
- ICSU will also work with partners to develop a follow-up mechanism based on the Millennium Ecosystem Assessment sub-global assessments to address additional research needs, to stimulate further sub-global assessments and develop methodological developments to link spatial and temporal scales.
- ICSU will work with partners to ensure follow-up to the Millennium Ecosystem Assessment regarding the strengthening of research and observations as underpinning for the UN Convention on Combating Desertification, the UN Convention on Biological Diversity, and the Ramsar Convention on Wetlands.

4.3 Human health

The protection of human health is a central concern of modern society and a major focus of scientific research. The types of health threats faced by different societies around the world vary widely, depending upon a country's wealth, food availability, level of education, public health infrastructure, access to medicines and other factors. For instance, infectious diseases and malnutrition are major threats in many developing countries, while cardiovascular disease and cancer are dominant concerns in wealthier nations. Pollution (of air, water and food), impacts of smoking, alcoholism and traffic accidents are world-wide health concerns and the AIDS pandemic and recent outbreaks of other infectious diseases have illustrated the global nature of many emerging health threats. Over the past century, science has led to enormous advances in public health, including the eradication of several major diseases and increased life expectancy in parts of the world. Yet there remain a wide array of human health problems that are potentially preventable or treatable with better scientific understanding and application of the necessary resources.

[13] See the report of the ICSU Working Group on Energy for Sustainable Societies (ICSU, 2004b)
[14] Final report of Millennium Assessment to be released in March 2005, see www.millenniumassessment.org .

Heretofore, ICSU has not been a major player in international health research and with some justification in that there are many other national and international bodies that focus on health research. At the same time, there is a growing awareness that human health is inextricably linked to the health of our planet and environmental change (areas in which ICSU have undoubted strengths). Similarly, it is difficult to envisage an integrated scientific approach to sustainable development that does not include human health issues. There is a wealth of expertise within the ICSU family on various aspects of health research, which needs to be more fully incorporated into ICSU's existing activities. There is also a need for new partnerships with the clinical research community.

Goal: To work through relevant Scientific Unions in order to strengthen the links to the World Health Organization and other bodies, such as the InterAcademy Medical Panel, and ensure that health considerations are duly taken into account in the planning and execution of future activities.

Specific objectives

- ICSU will assist with the development of two new research initiatives which will have a major focus on human health:
  - Science for Health and Well-being and Society is an ambitious truly multi-disciplinary initiative, bringing together the perspectives of many ICSU Unions, in a uniquely integrated approach to human health.
  - Global Environmental Change and Human Health is a new project that is being planned as part of the Earth Systems Science Partnership.

4.4 Exploring new horizons

A number of other important emerging scientific areas have been identified in the various strategic assessment and foresight consultation exercises[15]. Many of these are appropriate for new international and interdisciplinary initiatives from the ICSU family. A number of specific topics[16], not mentioned elsewhere in this strategic plan, have been identified:

- Cognitive neurosciences
- Complex systems science
- Human security and environmental refugees
- Molecular biosciences
- Nanotechnology
- Transgenic crops and their implications for the environment[17]

One mechanism by which ICSU can facilitate the development of these areas is by providing seed funding through its grants programme. Further to this, preliminary discussions with the

[15] See full reports (as listed in Box 1); all reports available at www.icsu.org.
[16] See "Foresight Analysis: report of the CSPR" (ICSU 2004a) for more specific details of scientific priorities under each of the listed topics.
[17] In 2003, ICSU published a well-received report, "New Genetics, Food and Agriculture: Scientific Discoveries – Societal Dilemmas" (ICSU 2003b), that analysed many authoritative national and international statements in this contentious area. See www.icsu.org.

European Science Foundation (ESF) have indicated that it would be interested in co-sponsoring a series of international conferences to explore some of these topics.

Goal: to monitor emerging international research priorities of importance to science and society and to develop mechanisms to ensure that these can be addressed in a timely manner by the relevant members of the ICSU family.

Specific Objectives

- ICSU member organizations will be encouraged to work together to develop activities in the areas listed above with direct support from ICSU where feasible, *e.g.* via the provision of seed funding.
- ICSU will assist in the development of a series of international ESF-ICSU conferences on key areas of interest to science and society. ICSU Members and ICSU Regional Offices have an important role to play in any such events.

5. Facilitating Interaction amongst Scientists

ICSU was created in order to bring together scientists from different countries and disciplines to discuss and exchange information and ideas. The geographical breadth of ICSU activities has changed over the years. The majority of science is still conducted in a small number of affluent nations, all of whom are well-represented in ICSU activities, but increasingly a major emphasis for ICSU has been the development of scientific capacity in developing countries and the inclusion of these scientists in international research initiatives on an equitable basis. At the disciplinary level, the role of ICSU in bringing different scientific perspectives and approaches together to address complex problems is perhaps even more important today than it has ever been. Many of the most exciting developments in science are occurring at the interfaces between disciplines.

5.1 Reaching out to all countries: ICSU Regional Offices

In 1966, ICSU established a Committee on Science and Technology in Developing Countries, the mandate of which was to analyse the problems of developing countries and identify how science and technology could address them. The central Secretariat for this Committee was hosted by India and a network of regional secretariats was established around the world. A review of this structure in 2001 concluded that it was no longer adequate to meet the diversity of regional needs (ICSU 2002a). In 2002, the ICSU General Assembly recommended that it be dissolved and replaced by four ICSU Regional Offices to be located in Africa, the Arab Region, Asia and the Pacific, and Latin America and the Caribbean.

This marks a fundamental change in ICSU structure, the aim of which is two-fold. Firstly, it should enhance participation of scientists and regional organizations from developing countries in the programmes and activities of the ICSU family. Secondly it will allow ICSU to play a more active role in strengthening science within the context of regional priorities, particularly in countries where science is less well developed.

In 2004, it was agreed to establish the Regional Office for Africa at the National Research Foundation, South Africa, and it is expected that an Office for Latin America and the Caribbean will be established at the Mexican Academy of Science in 2005. The locations of both of these Offices were chosen after regional consultations and they have the strong

support of the other countries in their region as well as their own respective national governments. Regional meetings will define regional priorities and strategies[18] and ICSU Regional Committees will provide oversight of the general programmes of the Regional Offices. Consultations are ongoing with countries in the two remaining regions with the aim of establishing the remaining two Regional Offices. The Regional Offices will work closely with the Regional Offices of TWAS[19] and UNESCO.

In addition to the four Regional Offices, special efforts will be necessary over the next six years to increase the involvement of countries from the former 'Eastern Block', including Russia and the Commonwealth of Independent States. These countries have a solid scientific research base but they are facing major problems in finding the necessary resources to support their scientific institutions. ICSU has a potentially important contribution to make by ensuring the participation of scientists and their representative institutions from these countries in international activities.

In addition to the establishment of Regional Offices, the review recommended the creation of a new Policy Committee for Developing Countries. This Committee will have an important role to play in providing vision and advice to the Executive Board on the advancement of science and the contribution of science to society in developing countries.

Goal: Via the establishment of Regional Offices and the Policy Committee for Developing Countries, to ensure the full participation of scientists from developing and transition countries in international science, including both the planning and implementation of the ICSU strategy and activities of the ICSU family.

Specific objectives

- ICSU will establish further Regional Offices in the Arab Region, as well as Asia and the Pacific. The four ICSU Regional Offices will become fully operational and develop their own regional strategies and activities.
- The Regional Offices will develop partnership and joint activities with the Regional Offices of TWAS and UNESCO.
- The Regional Offices will provide an important mechanism for ensuring that all countries are able to participate in ICSU activities and, in the longer-term, help expand ICSU's national membership base.
- In discussion with existing and potential National Members in the Commonwealth of Independent States, ICSU will develop appropriate actions to ensure their active involvement.

5.2 Building scientific capacity

Capacity building in science encompasses the efforts that are required to establish and maintain a critical mass of qualified scientists with the supporting infrastructure, including facilities and working conditions, that enable them to conduct research, education, training and advisory work. Capacity building is a challenge in all countries, although there are

[18] The First ICSU Regional Meeting for Africa was held in October 2004 (ICSU 2005c).
[19] In November 2004, the name of the Third World Academy of Sciences was changed to Academy of Sciences for the Developing World, although the original acronym, TWAS, was retained.

particular issues in many developing countries, where limited financial resources and an absence of universal education systems, amplify the problems.

In 2004, the InterAcademy Council produced a widely-acclaimed report, "Inventing a better future: a strategy for building worldwide capacities in science and technology" (IAC 2004a). This report provided the basis for ICSU to conduct its own Priority Area Assessment[20] to help define where it could uniquely contribute. The assessment identified a number of areas where the ICSU family can make important contributions to capacity building.

Goal: to ensure that capacity building, which is integral to all aspects of ICSU's mission, is given the necessary attention in all the activities of the ICSU family and in relevant policy fora.

Specific Objectives

- ICSU has a unique role to play in building scientific capacity in the context of its international programmes and will continue to build on successful initiatives[21] to ensure the participation of young scientists in these programmes.
- ICSU will establish a Committee on Science Education with a particular focus on science education at the secondary level, where Scientific Unions and National Members can make substantial contributions. This committee will provide a focus for interaction with other international science education initiatives.

5.3 Bringing disciplines together

Goal: To ensure that all disciplinary perspectives are considered in developing and implementing ICSU's overall strategy and that effective mechanisms are in place to facilitate the cross-fertilization of ideas within the ICSU family.

5.3.1 Consultation, foresight and planning

In 2002, ICSU published a meta-analysis of national governmental science foresight exercises – "Identification of Key Emerging Issues in Science and Society: an International Perspective on National Foresight Studies"[22]. This report described a number of key emerging issues in science and technology that are likely to have significant socio-economic implications in many countries. The report was used as the background for a broader consultation in 2003-2004 of the ICSU family to identify new and emerging issues, where ICSU might have an important role to play (ICSU, 2004a).

The overall outcome was the identification of 15 broad themes where actions by ICSU would be justified. Actions relating to the various themes are described in the current strategic plan as appropriate. However, the exercise itself and the final report attracted considerable

[20] Capacity Building in Science: Report of the CSPR Assessment Panel (ICSU, 2005b)
[21] The Global Change System for Analysis, Research and Training (START) was highlighted by the Assessment Panel as a very successful model of capacity building in the context of research on global environmental change
[22] This report was commissioned by the CSPR from the Science and Technology Policy Research Unit, University of Sussex, UK, and was based on an analysis of foresight exercises conducted by governments, national academies, other public bodies and international organizations in over 20 industrialised, transition and developing countries (ICSU 2002b).

attention and positive feed-back. It involved an extensive consultation with the whole ICSU family and thus generated a uniquely international and interdisciplinary analysis of the future priorities for science in relation to society. This is of considerable interest to both the scientific and policy communities. It is therefore proposed that this type of analysis be carried out at regular intervals.

Specific objective

- As part of its ongoing strategic planning, ICSU will carry out a further Foresight Analysis in preparation for the development of the 2nd six-year strategic plan, including analysis of possible regional differences in priorities as a means of ensuring that the international agenda takes account of regional needs.

5.3.2 Seeding new initiatives

ICSU is not a general research funding agency but historically has had a small amount of discretionary funding which, since 2001, has been distributed via a competitive strategic grants programme[23]. This programme is designed to provide seed funding for new international interdisciplinary initiatives that bring together a minimum of two ICSU Member organizations/Interdisciplinary Bodies. Priority areas are defined by CSPR in consultation with UNESCO, which co-sponsors the programme, but the actual activities are not prescribed. This allows considerable flexibility for scientific innovation and the exploration of novel ideas and approaches. The programme not only provides support for multidisciplinary activities that are very worthwhile in their own right, but it is also a vital mechanism for implementing and developing ICSU's overall strategy, including, for example, some of the emerging areas listed under 4.4. However, the maintenance of the grants programme is dependent on contributions from external funding agencies[24]. In order to be viable in the future, the ICSU grants programme needs a significant injection of additional funding.

In early 2001 a special *ad hoc* meeting of union representatives was convened to discuss future strategy and in particular capacity building. This scientific meeting of unions was repeated prior to the General Assembly in September 2002 and subsequently in 2004. These latter meetings included satellite meetings of various groupings of Unions, who came together to discuss scientific issues of common interest – geo-hazards, health, the food-chain. These meetings have proven to be a very valuable forum for bringing different disciplines together, to exchange scientific ideas, and develop joint initiatives.

Specific Objectives

- Extensive efforts will be made to attract additional funding to ensure the continuation of the grants programme. An initial target will be to secure overall funding at the previous level (800k Euros in 2003), although significantly more seed funding will be necessary to stimulate the actions required to address all the priorities identified in the strategic planning exercise.

[23] Details of the specific projects that are funded in the grants programme are included in the ICSU annual report and are available at www.icsu.org.

[24] During 2001-2005 the grants programme was co-funded by ICSU, UNESCO and the USA but financial constraints have reduced the programme in the latter two years and the long-term future commitment from the partners is uncertain.

- Depending on the available funding, CSPR will further develop the strategic grants programme in line with the priorities set out in this strategic plan and those of the co-funding organisations.
- Meetings of Scientific Unions will be convened by ICSU between General Assemblies in 2007 and 2010, with the aim of identifying emerging scientific priorities and stimulating the development of new inter-union initiatives.

6. Promoting Participation and Universality

Progress in science is made through the world-wide exchange of ideas, information, data, materials, and understanding of the work of others. Science is a cooperative exercise that thrives on open international interaction and exchange. It transcends national boundaries. In this sense, science is universal and when this universality is infringed, either intentionally or as an inadvertent side-effect of other policy decisions, it can have serious consequences for science and for society more broadly.

6.1 Universality of science

The essential elements of the Principle of the Universality of Science, as defined in ICSU's Statute 5 [Box 3], are non-discrimination and equity. In accordance with this principle, all scientists should have the possibility to participate, without discrimination and on an equitable basis in legitimate scientific activities, whether they be conducted in a national, trans-national or international context. ICSU has long promoted this principle, in particular by defending the rights of scientists to freely associate in international scientific meetings.

Box 3: ICSU Statute 5: The Universality of Science (revised wording still to be formally approved by Members)

The principle of the Universality of Science is fundamental to scientific progress. This principle embodies freedom of movement, association, expression and communication for scientists as well as equitable access to data, information and research materials. In pursuing its objectives in respect of the rights and responsibilities of scientists, the International Council for Science (ICSU) actively upholds this principle, and, in so doing, opposes any discrimination on the basis of such factors as ethnic origin, religion, citizenship, language, political stance, gender, sex or age. ICSU shall not accept disruption of its own activities by statements or actions that intentionally or otherwise prevent the application of this principle.

The ICSU Standing Committee on the Freedom in the Conduct of Science has served as the 'guardian' of Statute 5, ensuring that when the principle is breached appropriate action is taken. Most of its work has been out of the public eye, but many individual scientists across the world are grateful to this Committee for ensuring that their visa problems have been resolved so that they could attend international meetings. It played a particularly important role during the 'cold war' in ensuring the scientific exchange between East and West. However, with a changing international political picture and concerns about international

terrorism and national security, the challenges to universality are different today to those of the past[25].

In the light of these changes, the role and responsibilities of ICSU in relation to Universality were considered as part of a broader independent strategic review (ICSU 2005a), which concluded that the challenges to Universality were now such that the existing ICSU Policy Committee should adopt a broader remit, extending beyond visa issues for ICSU's own international meetings. ICSU Member organizations should also take on a greater role in awareness raising and safeguarding the principle of universality.

Goal: To raise awareness and promote responsibility for the Principle of the Universality of Science within and beyond the ICSU family

Specific Objective

- The Standing Committee on Freedom in the Conduct of Science will be restructured to take on a broader remit. In addition to continuing with its traditional case work in relation to the free association of scientists, it will be charged with working with ICSU Members to identify, discuss and advise on broader issues affecting Universality.

6.2 A universal public domain for data and information

The flow of scientific data and information is one of the most critical factors in promoting the participation of scientists in international research and in ensuring the universality of science. As well as being of importance to science itself, publicly available scientific data are increasingly important for decision-making by governments and many sectors of society, from clinical practitioners to farmers.

The nature and use of scientific data and information, the conditions under which scientific data and information are produced, distributed, and managed, and the role of scientists and other actors in these processes have been changing rapidly in recent years. These changes are partly a result of the revolution in computational capacity and connectivity that together have expanded the quality and quantity of research data. They are also related to the emergence of new questions in scientific research that require different types of data. Taken together, these changes are providing scientists throughout the world with more and enhanced access to research data and information. The benefits of this include the growing involvement of scientists in international research projects and increased scientific and policy interest in global scale and comparative research activities.

The Priority Area Assessment on Scientific Data and Information (ICSU 2004c) includes over 50 recommendations on future needs and priorities. It highlights the importance of professional data and information management and the need to build capacity in this area in all countries; the importance of coordination within the ICSU family and beyond, and the need to modernize or replace existing structures. There is a need for a new coordinated global approach aimed at providing universal and equitable access to quality data and information. Such an approach will require considerable national and international investment but the potential returns in the longer-term are enormous.

[25] The new context for Universality is described in detail in the document "Universality of Science in a Changing World" (ICSU, 2004g)

Goal: To facilitate a new coordinated global approach to scientific data and information that ensures equitable access to quality data and information for research, education and informed decision-making.

Specific Objectives

- ICSU will take the lead in developing a global framework for the production, management and dissemination/access of scientific data and information. An *ad hoc* Strategic Data and Information Committee will be established, for three years in the first instance, to oversee the development of this framework.
- In parallel with the development of the long-term strategic framework, ICSU will establish an international Scientific Data and Information Forum (SciDIF) involving all the key stakeholders: ICSU National and Union Members, Interdisciplinary Bodies, science funding bodies and other data providers and users. The aim of SciDIF will be to ensure that the full benefits of new data and information technologies and capabilities are extended to scientists throughout the world.
- ICSU will re-focus its own existing data and information structures as follows:

  i. The International Council for Scientific and Technical Information (ICSTI, a Scientific Associate of ICSU) will be encouraged to work more closely with the ICSU family on issues relating to science publishing, which is a rapidly evolving field[26];

  ii. The International Network for Access to Scientific Publications will work closely with the ICSU Regional Offices and the ICSU family to extend its services in developing countries;

  iii. The Committee on Data for Science and Technology will be encouraged to develop a long-term strategy, giving special attention to the needs of developing countries;

  iv. The World Data Centre system will be reformed taking account of user needs, including those of existing and new ICSU programmes. This will form part of development of the broader strategic framework for data and information.

7. Stimulating Dialogue and Shared Understanding

Strengthening science for the benefit of society can only be achieved if scientific knowledge is used not only to stimulate innovation and the development of new technologies but also to inform decision-making. This puts an onus on the scientific community to communicate with policy-makers at the local, national and international level. More widely, as we move towards a global knowledge economy, the interests and concerns of society in relation to the uses of science are expanding. Scientists and their representative organizations, such as ICSU, have to accept increasing responsibility and develop new mechanisms to share their understanding with many different stakeholders in society.

As the body that is uniquely representative of the international science community, ICSU is in many instances regarded as the voice of international science and renewed efforts have to be made to ensure that this voice is heard where it is most needed.

[26] On the basis of the priority area assessment, it will be recommended to the 28th ICSU General Assembly that Committee for the Dissemination of Scientific Information be disbanded and that ICSTI take on some of this policy committee's former advisory role.

7.1 Science and policy

"Good science is necessary for good decision-making and policy development at the local, national and international level". This is one of the key messages that ICSU communicated to the UN World Summit on Sustainable Development (2002) and the World Summit on the Information Society (2003). ICSU is committed to building on this conviction and ensuring that the voice of the international science community is heard at important international fora.

Goal: To ensure that science is integrated into policy development at the international and national level and that relevant policies take account both of scientific knowledge and the needs of science.

7.1.1 Sustainable development: Good governance needs good science.

Following on from the World Summit on Sustainable Development (2002), ICSU, together with the World Federation of Engineering Organizations, continues to represent the science and technology community in the annual meetings of the UN Commission on Sustainable Development. The Commission provides an important forum for interaction with the other, so called, 'Major Groups' of civil society (Business and Industry, Labour Unions, Local Authorities, Farmers, Women, Youth, Indigenous Peoples and NGOs) as well as with relevant UN bodies and government delegations. It provides an interface both between science and society and science and policy. As such, the Commission meetings provide a potential basis for the multi-stakeholder dialogue that is necessary to develop a relevant research agenda for sustainable development.

In 2004, the OECD Science Ministers issued an important statement on science for sustainable development calling for, among other things, a follow-up meeting to address how science for sustainable development can be further promoted. ICSU is working with the Government of South Africa, the International Group of Funding Agencies for Global Change Research and others to prepare for substantive scientific input to the follow-up process outlined in the Johannesburg Plan of Implementation as well as in preparation for a possible follow-up Summit in 2007.

Specific Objectives

- ICSU will continue to participate in the meetings of the UN Commission on Sustainable Development to ensure that science is fully integrated into policy development in relation to sustainable development.
- ICSU will participate in OECD efforts to strengthen science for sustainable development and will assist the Government of South Africa in the preparation of science input to WSSD+5.

7.1.2 The Information Society

ICSU actively participated in the first phase of the UN World Summit on the Information Society (WSIS, 2003). This included the development of an agenda for action – 'Science in

the Information Society'[27] that lays out the priority issues that need to be addressed at the policy and operational level in order that science can optimally contribute to the rapidly developing global information society. In particular this agenda sets out the key actions necessary to overcome the 'digital knowledge divide' that is a *sine qua non* for socio-economic development in many poorer countries. These actions, including the need to strengthen the public domain for science and provide universal and equitable access to scientific data, were incorporated into the formal documents that were adopted by governments in Geneva.

A follow-up to the Geneva (2003) Summit is planned for Tunis in 2005 and, with ICSU support several Interdisciplinary Bodies and Member organizations[28] have been closely involved in taking forward issues identified in the Geneva action plan in preparation for Tunis.

At the time of writing this strategic plan it is uncertain what the impact of the Tunis Summit is likely to be and what governmental follow-up process will be implemented. A continuing formal role for ICSU is unlikely. However, whatever happens, it is certain that many of the key issues that have been raised in the summit regarding the role of science in the information society will continue to be discussed in international policy fora to which ICSU can contribute. In this context, one of the major concerns relating to scientific data and information is the need to develop national and international policies on intellectual property rights that strengthen rather than weaken science. Such policies were hotly debated in the summit process but, whilst the importance of a strong public domain for science and education was acknowledged, it was not clear how this might impact on international organizations, such as the World Intellectual Property Organization, that have responsibility for intellectual property issues.

Specific objectives

- In taking forward the development of an integrated global framework for scientific data and information, ICSU will participate in key international policy for a.
- ICSU will explore, with its members, how appropriate mechanisms can be implemented to ensure that science is fully represented in international organizations, such as WIPO, that might have an impact on access to data and information (and other 'scientific goods') for scientific purposes.

7.2 Science and society

Both the practice of science and the interaction of science with society have changed very significantly in the past two decades[29]. Scientific evidence has become essential to policy making in many areas, from agricultural practices to carbon emissions. There is also a greater emphasis on economic growth through innovation and commercialization, which is directly affecting many public research institutions. Accelerated innovation and technology

[27] This agenda for action is based on in a series of five documents that were published by ICSU (ICSU 2003c) on the following themes: "Universal access to scientific knowledge"; "Decision making and governance"; " Policy issues for scientific information"; "Improving Education and Understanding" and "Optimizing Knowledge" (see www.icsu.org)

[28] CODATA, INASP, IUPsyS and several national academies including the USA and France.

[29] These changes and the new challenges that they raise are discussed in detail in the report Science and Society: Rights and Responsibilities (ICSU, 2005a)

development has been accompanied by increased public awareness of technological risk and scientific uncertainty.

These changes have raised the importance of, and also produced new opportunities to, increase public engagement with science. The globalization of both science and society reinforces the needs for greater cross-cultural understanding and tolerance. Because of its international and interdisciplinary membership, ICSU is uniquely positioned to promote the dialogue that is necessary within the scientific community and by working with partners in the public and private sector it can extend this dialogue into society at large.

Goal: To ensure a greater awareness of the valuable contribution of science to society and improved mutual understanding between science and other sectors of society, with a particular focus on ICSU's scientific priorities.

Specific objective

- To build on existing expertise within the ICSU family and develop a strategy for improving public communication on international scientific priority issues.

Part III Strengthening the Structures

8. Delivering the Strategy: Structure and Funding

In order to implement the strategy outlined in this document, including the development of several major new initiatives, ICSU must build on its major strength, the National and Scientific Union Members. There will need to be a continuing evolution in ICSU's structures and mechanisms and additional funding must be secured.

8.1 Members

ICSU is a membership organization. The legitimacy of ICSU depends on its broad disciplinary and international membership. The ability of ICSU to plan and implement scientific initiatives depends on individual scientists, who come from Member organizations and the institutional and financial support of these same organizations. It goes without saying that the full support and active participation of the ICSU Members will be the single most critical factor in implementing ICSU's strategy.

At the same time, as science develops into new interdisciplinary areas and ICSU tries to reach out to countries that are still largely excluded from international science, the limitations of the current ICSU membership structure become apparent. The membership of ICSU can be criticized both in terms of disciplinary expertise and geographical coverage.

Goal: To ensure that ICSU has an active worldwide membership, with well-developed links to national science and policy communities and the necessary disciplinary expertise to strengthen international science for the benefit of society.

8.1.1 National Members

To be credible as an international voice for science, ICSU must ensure that it can reach out to a broader national membership base. The membership in Africa, for example, is still very weak (Figure 1). The developing countries must have a stronger voice in the development of the international agenda and scientists from the developing world must play a more active role in ICSU activities, including its research programmes.

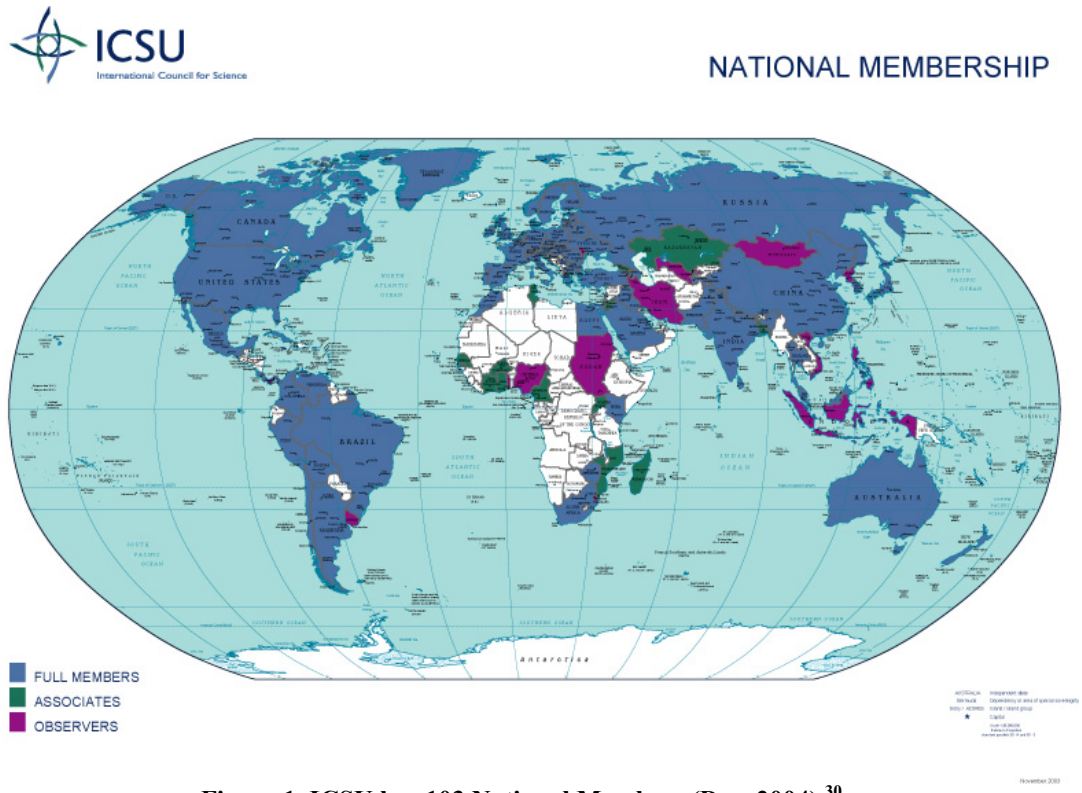

Figure 1. ICSU has 103 National Members (Dec. 2004).[30].
See also the list on the inside back cover.

It is also important to ensure that national scientific communities are represented by the most appropriate organizations. ICSU has a rich diversity of National Members: science academies, research funding agencies, research institutes, and, in a small number of cases, government ministries. Even within a single category, such as science academies, there is considerable heterogeneity in terms of both functions and disciplinary representation. This

[30] In addition to full voting members, there are two other categories of National Member. National Scientific Associates are bodies that are not quite ready for full membership. They are normally required to apply for Full Member status within six years of becoming an Associate Member. Associates do not have voting rights at ICSU General Assemblies and do not pay dues. The Observer category allows Members who cannot currently meet their financial obligations to maintain ties with ICSU. Normally, no Observer shall be allowed to remain in this category for more than six years. Observers do not have voting rights at ICSU General Assemblies.

diversity is an expression of the different national systems for science and, as these systems change, there may occasionally be a need for existing ICSU members to consider whether they are still the most appropriate body to adhere to ICSU. From the ICSU perspective, what is required is active members, who are representative of, and can provide links to, their national scientific communities. This includes being able to link to activities of the Scientific Unions and Interdisciplinary Bodies at the national level. National members also have a key role to play in ensuring the link between science and policy.

A particular challenge for ICSU is ensuring that its activities are linked to research funding agencies at the national level. Where the adhering member is such an agency, then this should be a lesser problem. However, this is the exception rather than the rule. Nevertheless, in order for ICSU to implement its programme activities it needs to influence national research strategies and mobilize national funding. This has been achieved to some extent in the context of the global environmental change programmes, for which a special International Group of Funding Agencies for Global Change Research has been established. However, ICSU needs to work with its membership to ensure more consistent links with national and regional research funding bodies

Specific Objectives

- ICSU will intensify the dialogue with National Members in order to build on their competencies in developing new programme and policy activities.
- ICSU will work with its Regional Offices to significantly expand the number of National Members from developing countries.
- ICSU will explore mechanisms to develop a dialogue with national funding agencies as an integral part of its development of international research programmes.

8.1.2 International Scientific Unions

The ICSU Union membership has historically been focussed on the natural sciences. Many of the new initiatives in this strategic plan necessitate disciplinary competence not covered by current Union Members. ICSU needs to increase disciplinary competence within social sciences as well as technological and health sciences. This is also important, with regards to the legitimacy of ICSU to speak on behalf of the global science community in international fora, such as the United Nations.

Although strategic partnerships with, for example, the International Social Science Council and various international engineering organizations may partly fulfil these needs, additional Union membership may also be necessary. Should there be an increase in the number of Scientific Unions, it may also be necessary to consider a formal clustering of Unions[31].

A recurrent theme in the assessment and review process has been the need for improved communication and coordination between the activities of the Interdisciplinary Bodies and the Scientific Unions. It is important that the wealth of expertise that exists within the Scientific

[31] An *ad hoc* sub-group of the ICSU Executive Board carried out a preliminary review of some of the issues relating to the Union membership of ICSU in 2004. This considered a clustering mechanism to generate four groupings of ICSU members: Physical and Chemical Sciences; Earth and Space Sciences; Biological Sciences and Social Sciences. In the first instance it is proposed that such groupings should be established to ensure appropriate disciplinary representation on the ICSU Executive Board.

Unions is utilized to the fullest extent, and the programmes of the Interdisciplinary Bodies have much to offer to the Unions.

Specific Objectives

- Mechanisms will be developed to facilitate collaboration with those disciplines not currently represented in ICSU, in the context of the current strategic plan.
- The Scientific Unions and Interdisciplinary Bodies will be encouraged to develop mechanisms for increased collaboration.

8.2 Governance and the Secretariat

The external assessment of ICSU in 1996 recommended a number of changes to the Council's governance structure, which have subsequently been implemented. These principally included the establishment of a Committee on Scientific Planning and Review; disbandment of the General Committee and an expanded membership for the Executive Board. These changes at the level of governance have been complemented by equally significant changes at the Secretariat. The number of scientifically qualified staff has increased dramatically over the past few years. In 1995, no ICSU staff had a science degree, while in 2005 almost 50% of the staff had postgraduate scientific training. This new expertise has been married to experienced administrative support and the combination of both has been crucial to the strategic planning and will be even more important in the implementation of this strategy.

With its new governance structure and more comprehensive Secretariat support staff, ICSU is better equipped than ever to strengthen international science for the benefit of society. However, in order to fully implement the ambitious strategy laid out in this document, there will need to be a continuing evolution of the ICSU Secretariat and some additional skills will be required.

In line with the changes in ICSU as an organization, the overall corporate image was revisited in 2003. The most visible manifestation of this was a new logo. More importantly, as part of this process, all regular ICSU publications were reviewed and either replaced or modernised, for example the previous ICSU Annual Report (~600pp) has been replaced by a more accessible Annual Report (~30pp). The Council has published a number of widely disseminated reports since 2002 in preparation for the World Summit on Sustainable Development, the World Summit on the Information Society, and as part of the strategic planning exercise. Considerable effort has also gone into enhancing electronic communications, including the launching of a new website and tri-monthly e-newsletter, Insight. A central role in these activities was played by the Communications Officer, a position that had not previously existed within the ICSU Secretariat. Regrettably, this post had to be put into abeyance in 2004 because of financial exigencies.

ICSU's communication strategy needs to be further developed. In particular, greater efforts must be made to engage scientists and policy-makers outside of the ICSU family. This will require establishing strong links with communication professionals within ICSU's own member organizations and directly with science journalists.

Goal: To continue to develop the professional Secretariat that is necessary for ICSU to function as a strategic science organization.

Specific Objectives

- Additional scientific project management expertise will be recruited to the Secretariat on a project basis. This will require either additional funding and/or short-term secondments from ICSU National Members or partners.
- A Communication Officer will be recruited to further develop and ensure the implementation of a communication strategy in line with ICSU's overall scientific strategy.

8.3 Strategic partners

Over time, ICSU has established a number of key strategic partnerships that have been important for both research and policy activities. Such partnerships will be important in taking forward ICSU's strategy.

Goal: To further develop active strategic partnerships with appropriate international governmental and non-governmental partners that will bring distinct added value to ICSU activities and help deliver its overall mission.

8.3.1 The UN system and UNESCO

At the international science policy level, ICSU's most valuable partners are the various United Nations agencies that have a remit for science. The governmental nature of the UN provides an important complement to ICSU as an independent non-governmental organization. In this context, the principal partner for ICSU is UNESCO, which has been working closely with ICSU since its creation in 1946.

UNESCO is an important co-sponsor of the World Climate Research Programme[32] and the International Programme of Biodiversity Science[33]. UNESCO and ICSU co-organized the World Conference on Science in 1999, which brought together scientists and government ministers, and a follow-up symposium in 2005. The organization was also a key partner for ICSU in several activities relating to the UN World Summits on Sustainable Development and the Information Society. The International Union of Geological Sciences co-sponsors the International Geological Programme of UNESCO and, looking to the future, the Scientific Unions are likely to be key partners in the International Basic Sciences Programme that is being developed by UNESCO. In addition to these specific activities, ICSU receives valuable UNESCO funding, which is used to seed new initiatives via the strategic grants programme. This financial contribution is governed by a six-year Framework agreement that will be considered for renewal in 2007.

UNESCO has five main sectors – Science (Natural and Social), Communications and Information, Education, and Culture. Historically, ICSU's main relations have been with the Natural Sciences Sector but over the past three years, the partnerships with the other sectors have been strengthened. Social sciences, education and communication and information are all integral to ICSU's strategy and UNESCO as a whole will be as crucial a partner for ICSU in the future as it has been in the past.

[32] WCRP is co-sponsored by ICSU, the International Oceanographic Commission of UNESCO and the World Meteorological Organisation.
[33] DIVERSITAS is co-sponsored by five organizations: ICSU, IUBS, SCOPE, UNESCO and IUMS.

Whilst UNESCO continues to be ICSU's principal partner in the UN system, there are several other UN bodies that also have strong links with ICSU. For example, the World Meteorological Organization hosts the Secretariat for the World Climate Research Programme and will co-sponsor the International Polar Year: 2007-2008. Several UN agencies[34] collaborate with ICSU as sponsors of the three Global Observing Systems and this same partnership will be important in defining the science agenda for the planned Global Earth Observing System of Systems (GEOSS).

Because of ICSU's strong environment portfolio, the United National Environment Programme (UNEP) is also an important partner. The ICSU Scientific Committee on Problems of the Environment has worked with UNEP for many years, but there is every reason for ICSU itself to seek more specific collaborative ties with UNEP. ICSU has participated in several recent meetings to explore how the scientific basis of UNEP can be strengthened. Closer collaboration would be an important complement to ICSU's work with the UN Commission for Sustainable Development (see 7.1.1).

Science and higher education policy is another important area for future collaboration between ICSU and intergovernmental science organizations. For example, the UNESCO Forum on Higher Education, Research, and Knowledge Systems, in which ICSU is a formal partner, is planning to expand from its initial focus on higher education systems to include research systems. UNESCO, and other organizations such as OECD, has valuable expertise in data gathering and statistical analysis, which could be used to monitor the stocks and flows of scientists and provide a more rigorous basis for addressing the 'brain drain', which is a critical issue for international science[35].

Specific Objectives

- This strategic plan will form the basis for renegotiating the Framework agreement with UNESCO in 2007. In addition to continuing the invaluable support for the strategic grants programme, UNESCO will be invited to participate/co-sponsor other new initiatives.
- Whilst the Natural Sciences Sector will continue to be ICSU's main partner within UNESCO, relations with other sectors will be strengthened still further. Science education, science and society and the 'public domain for science' are key topics where closer collaboration should be developed.
- ICSU will seek strengthened involvement with the United Nations Environment Programme, in particular through the UNEP Science Initiative.
- UNESCO, UNEP, WMO and FAO will continue to be key partners in order to link research, monitoring, assessment and policy.
- ICSU will strengthen its links to UNESCO in areas of science policy, including active participation in the Forum Higher Education, Research and Knowledge Systems.
- Through the Regional Offices of ICSU and UNESCO, collaborative partnerships that are of particular relevance to the ICSU National Members in the regions, will be developed.

[34] ICSU together with WMO, UNESCO, FAO and UNEP co-sponsor the climate, ocean and terrestrial observing systems

[35] the need for better quantification of the problem of 'brain drain' is discussed in the Priority Area Assessment on Capacity Building in Science (ICSU, 2005b).

- New partnerships will be developed on a 'case by case' basis with the most appropriate UN agencies and other intergovernmental bodies. This will provide critical links to the international, intergovernmental, policy-making system. It should also in some instances result in additional financial support.

8.3.2 International non-governmental science and technology organizations

Over the years ICSU has worked in collaboration with numerous organizations and these partnerships have been critical in almost all major activities. There are also a small number of non-governmental science organizations with whom ICSU has developed more regular interactions at an institutional level.

ICSU has a formal Memorandum of Understanding with TWAS, which was founded in 1983 and has over 700 individual scientific members, mainly from developing countries. The Academy is active in capacity building for science and has a number of support programmes for individual scientists and institutions, including a Visiting Scientists Programme[36], which is co-sponsored by ICSU. The Academy has also been an important partner in recent activities relating to science for sustainable development. In parallel to the establishment of ICSU regional offices, the Academy is developing Regional Offices and there is clear potential for working closely together at this level in the future.

The InterAcademy Panel on International Issues (IAP) is a network of over 90 national science academies that was launched in 1993. There is considerable overlap with the membership of ICSU and a sharing of common interests The Panel produces position statements on key scientific topics and has a programme for strengthening academies in developing countries, which is very relevant to ICSU. The Panel is also developing new actions in specific areas, such as water and scientific information, in which ICSU has major programmes. One area, where the Panel and ICSU have been working closely together is science education: on the basis of activities initiated by the ICSU Committee on Capacity Building in Science, a joint web-portal[37] has been developed, on which Scientific Unions and National Members are able to publicize their education and capacity building activities.

The InterAcademy Council was created in 2000 as a Foundation whose rotating Board membership represents 15 national science academies. It has an independent Secretariat and conducts in-depth study reports on key topics for international science but it is not an implementing organization. The first study report on capacity building was widely acclaimed and provided a valuable starting point for ICSU's own more-limited priority area assessment on this topic (ICSU, 2005b). The recent study on agriculture and food security in Africa[38] will provide important input to the International Assessment on Agricultural Science and Technology for Development launched by the World Bank and other UN organizations and in which ICSU is one of the key scientific partners. The planned studies on "Women in Science" and "Energy" should be similarly valuable in informing future ICSU activities.

[36] Following a review in 2001, the Visiting Scientists programme replaced two previous programmes – for short-term Fellowships and visiting Professorships. It is co-sponsored by TWAS, ICSU, UNESCO and the United Nations University/Institute for Advanced Study.

[37] The teaching science web-portal has two main foci: information on 'hands on' teaching programmes a the primary school level and more general information on the capacity building activities of ICSU and IAP members (see www.icsu.org)

[38] Realizing the Promise and Potential of African Agriculture (IAC 2004b).

ICSU often works closely with other representative organizations, when there is need for disciplinary expertise outside that of its own Scientific Unions. This is particularly the case in relation, to engineering, health and social sciences. For example, the World Federation of Engineering Organizations is a formal partner in representing of the Science and Technology Community in the Commission on Sustainable Development (although there are also other active organizations that represent technological sciences and with whom productive partnerships might also be developed). The International Social Sciences Council has also been involved, albeit to a lesser extent, in the UN sustainable development discussions, as well as being a co-sponsor of the International Human Dimensions Programme. In the health area, the newly created InterAcademy Medical Panel may develop into an appropriate partner for some activities, where clinical representation and expertise is required.

One up-and-coming event for which additional partnerships will be necessary is the 75th anniversary of ICSU, which will occur in 2006. The focus for this will be 'young scientists and international science'. In order to be effective, ICSU will have to work with its own membership and develop links with those organizations that represent the younger scientific community.

In nurturing all of these partnerships it needs to be recognized that there can be considerable extra cost in terms of workload and dilution of recognition/credit as well as significant potential added-value and increased impact. The balance between the costs and the rewards need to be carefully assessed on a case by case basis. There is a potential concern about the overlap in membership and remit between ICSU and the InterAcademy Panel on International Issues, which is leading to some confusion at the level of individual ICSU members and within the international science community more broadly. However, international science is a very broad area and active and productive partnerships with other organizations will be critical in taking forward ICSU's strategy.

Specific Objectives

- ICSU will form partnerships and co-sponsor activities on a case by case basis and where these partnerships can clearly add value and the activities themselves directly contribute to ICSU's own mission.
- TWAS continues to be a major ICSU partner and new joint projects will be developed in support of the Regional Offices, basic sciences in developing countries, and other areas of common interest.
- ICSU will work with the InterAcademy Panel to ensure that its membership is fully informed of ICSU initiatives and identify areas where there is potential to develop active collaboration.
- ICSU will strengthen its links with the InterAcademy Council, whose expert reports can be very valuable in informing ICSU's strategy. ICSU will review what it can contribute to the implementation of recommendations of such reports.
- ICSU collaboration with the International Social Sciences Council as co-sponsors of the International Human Dimensions Programme will continue. ICSU will increasingly seek productive collaboration in areas of social science, where it lacks expertise.
- In order to strengthen input from the engineering sciences, ICSU will explore collaboration with the International Council of Academies of Engineering and Technological Sciences, whilst continuing the existing partnership with the World

Federation of Engineering Organizations for the UN Commission on Sustainable Development.

- As the need for expertise in the medical sciences increase, ICSU will develop partnership with the InterAcademy Medical Panel and/or other representative organizations.

8.4 More flexible implementation mechanisms and quality assurance

Historically, ICSU has implemented new initiatives by establishing Interdisciplinary Bodies or co-sponsored Joint Initiatives. It has also, over time, established a small number of Policy or Advisory Committees to advise the Executive Board and membership in key areas such as ethics, universality and scientific publishing. Almost all of these structures were conceived at the outset as long-term 'standing' bodies. Some renewal mechanisms were built into them, with committee membership being changed every three years and statutory performance reviews every six years. However, the broader issue of whether any individual body should continue to be a high priority for ICSU was not directly addressed. The net result was that many ICSU bodies had very long life-spans and ICSU's overall portfolio expanded in a somewhat *ad hoc* manner that did not necessarily reflect the key priorities for science and society.

Over the past four years, CSPR and the Executive Board have overseen a review process that has considered all of ICSU's Interdisciplinary Bodies, Joint Initiatives and Policy/Advisory Committees in a broader strategic context. As a result of this process, seven Interdisciplinary Bodies[39] have been disbanded and several others have been re-directed. In addition five Policy/Advisory Committees [40] have been closed down. ICSU now has a more coherent portfolio of bodies and committees that address its main strategic priorities and will be complemented by the other new initiatives described in this strategic plan. However, it has also become clear from the strategic review process that the existing implementation mechanisms need to be modified to prevent stagnation and ensure renewal of future activities. In particular, there needs to be a move away from permanent structures to more *ad hoc*, time-limited activities and new initiatives will in future be established with clear 'sunset clauses' from the outset.

Goal: To ensure that all ICSU activities continue to be of high quality and strategically relevant.

Specific objectives

- The implementation of new ICSU initiatives will be done by establishing *ad hoc* committees and structures for limited periods of time.
- As part of its ongoing strategic planning role, CSPR will continue to monitor the ICSU portfolio of current and new activities, initiating new Priority Area Assessments or specific *ad hoc* reviews, as necessary. This should ensure both the quality of individual activities and the strategic direction of the portfolio as a whole.

[39] FAGS, CCBS, CDR, CSFS, ACOGEB, SCL and SCOWAR
[40] CG, SCRES, CDSI, COSTED and ACE
see www.icsu.org for full names and further details of these bodies

8.5 Funding

The principle source of funding for ICSU is membership dues. The costs of core activities, as agreed to by Members, need to be covered by these dues. In the very active period of development of this strategic plan, 2003-2006, ICSU's budget has been significantly reduced in real terms because of the devaluation of the US Dollar versus the Euro. Dues were established in US Dollars at the 2002 General Assembly on an assumption of parity with the Euro. As most of ICSU's expenditure is in Euros, this has caused a major budget deficit, which could only be solved by using up ICSU's non-mandatory reserves. It will be proposed to the 28th General Assembly (October, 2005) that this loss, ~20-30%, in core funding be rectified and that dues should be fixed in Euros to ensure income and expenditure in the same currency. In presenting three-year budgets to the General Assembly for approval, the Executive Board will clearly indicate what part of the work programme it proposes to be funded by the core.

Historically, the other major sources of funding to ICSU have been grants from partner organizations and foundations, including annual funding from the US State Department and UNESCO, which has been used to seed new initiatives via the grants programme, and the US National Science Foundation - for activities in the general area of the environment. In 2002 additional funding was also secured from several foundations in the USA for activities related to sustainable development. Whilst, the continuity of this 'external' funding cannot be relied upon to support long-term core activities, it is essential for seeding new initiatives, via the grants programme, and for 'kick-starting' any major program or policy activities.

The strategic plan laid out in this document, after extensive consultation within and beyond the ICSU family, cannot be fully implemented without additional Member dues and the consolidation of existing financial support from partners. However, this alone will not be sufficient to cover the costs of the proposed major new scientific initiatives. A concerted effort will have to be made to secure funding for these from a variety of potential sources, including:

1. Special *a la carte* contributions from ICSU Members similar to that for Interdisciplinary Bodies. Some of the bodies that have recently been disbanded, including COSTED and ACOGEB, were supported in this way. 'In kind' support or the hosting of secretariat functions for new initiatives is also an option.
2. Competitive funding from national funding agencies and private foundations. The strategic plan itself provides the basis for concerted fund-raising efforts over the next six years.

Goal: To ensure adequate long-term funding to support the planning, coordination and support functions of ICSU and the additional funding necessary to implement the new initiatives described in this strategic plan.

Note. A financial strategy and detailed budget documents will be prepared as separate documents for the GA specifying which activities are proposed to be covered by core funding (membership dues), and for which activities* a la carte *and/or project funding will be sought.

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List of Acronyms

ACOGEB	Advisory Committee on Genetic Experimentation and Biotechnology
AIDS	Acquired Immune Deficiency Syndrome
CDSI	Committee on Dissemination of Scientific Information
COSPAR	Committee on Space Research
COSTED	Committee on Science and Technology in Developing Countries
CSPR	Committee on Scientific Planning and Review
DIVERSITAS	An international programme of biodiversity science
ESF	European Science Foundation
FAGS	Federation of Astronomical and Geophysical Data Analysis Services
FAO	Food and Agriculture Organisation of the UN
GA	General Assembly
GCOS	Global Climate Observing System
GEOSS	Global Earth Observation System of Systems
GOOS	Global Ocean Observing System
GTOS	Global Terrestrial Observing System
IAC	InterAcademy Council
IAP	InterAcademy Panel on International Issues
ICSTI	International Council for Scientific and Technical Information
ICSU	International Council for Science
IGBP	International Geosphere Biosphere Programme
IGFA	International Group of Funding Agencies for Global Change Research
IGOS	Integrated Global Observing Strategy
IGY	International Geophysical Year
IHDP	International Human Dimensions Programme on Global Environmental Change
INASP	International Network for the Availability of Scientific Publications
IOC	Intergovernmental Oceanographic Commission
IPY	International Polar Year
ISSC	International Social Science Council
IUBS	International Union of Biological Sciences
IUCAF	Scientific Committee on Frequency Allocations for Radio Astronomy and Space Science
IUMS	International Union of Microbiological Societies
MA	Millennium Ecosystem Assessment
WDC	World Data Centres
WIPO	World Intellectual Property Organization
NEPAD	New Partnership for African Development
NGO	Non Governmental Organization
OECD	Organisation for Economic Cooperation and Development
SCAR	Scientific Committee on Antarctic Research
SCL	Scientific Committee on the Lithosphere

SCOPE	Scientific Committee on Problems of the Environment
SCOR	Scientific Committee on Oceanic Research
SCOSTEP	Scientific Committee on Solar Terrestrial Physics
TWAS	Academy of Sciences for the Developing World
UN	United Nations
UNEP	United National Environment Programme
UNESCO	United Nations Educational Scientific and Cultural Organization
UNU/IAS	United Nations University/Institute of Advanced Studies
WCRP	World Climate Research Programme
WMO	World Meteorological Organization
WSIS	World Summit on the Information Society
WSSD	World Summit on Sustainable Development

[To be inserted on inside back cover]

National Members
List includes full Members, Scientific Associates*, and Observers**.

Argentina	Croatia	Jamaica**	Netherlands	Swaziland**
Armenia	Cuba	Japan	New Zealand	Sweden
Australia	Czech Republic	Jordan*	Nigeria**	Switzerland
Austria	Denmark	Kazakhstan*	Norway	Tajikistan
Azerbaijan	Egypt	Kenya	Pakistan**	Tanzania
Bangladesh*	Estonia	Korea (DPR) **	Panama**	Thailand
Belarus	Finland	Korea, Rep. of	Peru	Togo**
Belgium	France	Latvia	Philippines**	Tunisia*
Bolivia	Georgia*	Lebanon	Poland	Turkey
Brazil	Germany	Lithuania	Portugal	Uganda*
Bulgaria	Ghana	Luxemburg	Romania	Ukraine
Burkina Faso*	Greece	Macedonia	Russia	United Kingdom
Cameroon*	Guatemala*	Madagascar*	Saudi Arabia	USA
Canada	Hungary	Malaysia	Senegal*	Uruguay**
Caribbean*	India	Mexico	Seychelles*	Uzbekistan**
Chile	Indonesia**	Moldova**	Singapore	Vatican City State
China: CAST	Iran**	Monaco	Slovak Republic	Venezuela
China: Taipei	Iraq	Mongolia**	South Africa	Vietnam**
Colombia	Ireland	Morocco	Spain	Zimbabwe
Costa Rica	Israel	Mozambique*	Sri Lanka	
Côte d'Ivoire*	Italy	Nepal	Sudan**	

Scientific Union Members

International Astronomical Union (IAU)
International Brain Research Organization (IBRO)
International Geographical Union (IGU)
International Mathematical Union (IMU)
International Society for Photogrammetry and Remote Sensing (ISPRS)
International Union for Physical and Engineering Sciences in Medicine (IUPESM)
International Union for Pure and Applied Biophysics (IUPAB)
International Union of Anthropological and Ethnographical Sciences (IUAES)
International Union of Biochemistry and Molecular Biology (IUBMB)
International Union of Biological Sciences (IUBS)
International Union of Crystallography (IUCr)
International Union of Food Science and Technology (IUFoST)
International Union of Geodesy and Geophysics (IUGG)
International Union of Geological Sciences (IUGS)
International Union of the History and Philosophy of Science (IUHPS)
International Union of Immunological Societies (IUIS)
International Union of Microbiological Societies (IUMS)
International Union of Nutritional Sciences (IUNS)
International Union of Pharmacology (IUPHAR)
International Union of Physiological Sciences (IUPS)
International Union of Psychological Sciences (IUPsyS)
International Union of Pure and Applied Chemistry (IUPAC)
International Union of Pure and Applied Physics (IUPAP)
International Union of Soil Sciences (IUSS)
International Union of Theoretical and Applied Mechanics (IUTAM)
International Union of Toxicology (IUTOX)
Union Radio Scientifique International (URSI)

Scientific Associates

Academia de Ciencias de America Latina (ACAL)
Engineering Committee on Oceanic Resources (ECOR)
Federation of Asian Scientific Academies and Societies (FASAS)
International Association of Hydraulic Engineering and Research (IAHR)
International Cartographic Association (ICA)
International Cell Research Organization (ICRO)
International Council for Laboratory Animal Science (ICLAS)
International Council for Scientific and Technical Information (ICSTI)
International Federation for Information Processing (IFIP)
International Federation of Library Associations and Institutions (IFLA)
International Federation of Science Editors (IFSE)
International Federation of Societies for Microscopy (IFSM)
International Federation of Surveyors (FIG)
International Foundation for Science (IFS)
International Institute for Applied Systems Analysis (IIASA)
International Radiation Protection Association (IRPA)
International Society of Endocrinology (ISE)
International Union for Quaternary Research (INQUA)
International Union of Forestry Research Organizations (IUFRO)
International Union for Vacuum Science, Technique and Applications (IUVSTA)
International Water Association (IWA)
Pacific Science Association (PSA)
Academy of Sciences for the Developing World (TWAS)