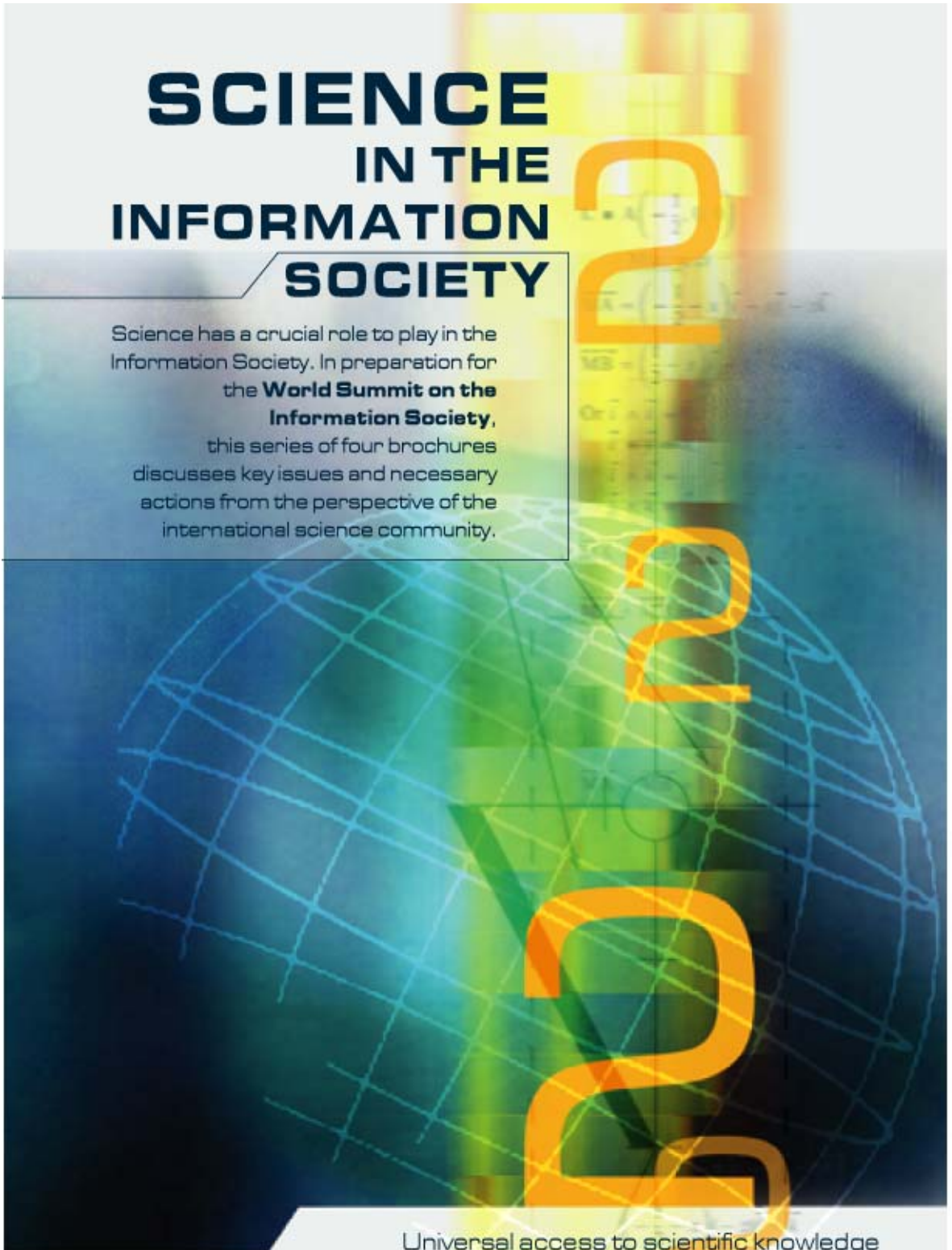
SCIENCE IN THE INFORMATION SOCIETY

Science has a crucial role to play in the Information Society. In preparation for the **World Summit on the Information Society**, this series of four brochures discusses key issues and necessary actions from the perspective of the international science community.



Universal access to scientific knowledge

» Decision making and governance

Policy issues for scientific information

Improving education and training

ICSU
International Council for Science

Science plays a crucial role in identifying and analyzing the many challenges faced by society and in generating the knowledge to respond appropriately. Thus, scientific data and information is essential to support good decision making and policy development.

>> DECISION MAKING AND GOVERNANCE

Information and Communication Technologies (ICTs) are transforming governance at many levels, in part by facilitating the involvement of more actors, whose effective interaction relies on the open availability of high quality data and information. A common pool of scientific data creates a knowledge infrastructure—**the public domain for science**—from which the whole of society should be able to benefit in an equitable way.

Effective interaction between the various stakeholders involved in, or affected by, policies formulated on the basis of scientific data requires total transparency in data collection and dissemination. The values of certainty and uncertainty, with respect to original scientific data, must be well understood by all parties to ensure the rational use of knowledge derived from this data. The media have an important and influential role to play in widely and responsibly disseminating scientific information.

KEY PRINCIPLES:

- **Data created with the use of public funds should be recognized as a public resource and remain publicly accessible.**
- **Standardization and quality assurance of scientific data and information are required for sound decision making.**
- **Use of ICTs should ensure the open access and transparency essential for the effective use of data by decision makers.**

CHALLENGES

In order to ensure that ICTs effectively support good decision making and governance, a number of major challenges must be overcome.

- Long-term monitoring and collection of high quality scientific data are not sufficiently valued by some national governments.
- There is inadequate dialogue between scientists, decision makers, and civil society.
- The requirements of scientific independence and the needs of society must be balanced.
- There is a need to ensure interoperability between established systems for data collection and dissemination and the new, ICT-based, methods.
- There are difficulties in establishing working links and understanding between traditional and modern knowledge systems, which can be further exacerbated by the use of ICTs.

Sharing data

A recent case study, on the use of scientific data in decision making related to sustainable development, in the Senegal River Basin (West Africa) illustrates the importance of collecting and integrating data from many different disciplines and sources. The livelihoods and health of many people in several countries depend on access to water from this region. Because the problems confronting management of this area are complex (e.g. endemic malaria), their resolution requires data from many sources and over variable timescales (e.g. rainfall estimates and infectivity rates).

In practice local and regional decision makers are confronted with a lack of baseline data, an inability to locate and share existing data, and a time lag between data acquisition and availability. This creates serious consequences for health and agriculture management. Wider use of ICTs would help establish a shared knowledge base founded on reliable data and improve access to, and dissemination of, relevant information from local and foreign data sources.
www.nap.edu.catalog/10546.html

>> **Increase public investment in the collection and management of scientific data necessary to underpin sound decision making.** Governments should be made better aware of the importance of integrating scientific data from research into policy and decision making. It is particularly important to prioritize essential data collection activities in the poorest countries.

ACTIONS REQUIRED

>> **Ensure long-term support for the collection of data and the maintenance of scientific databases.** In many areas, particularly those relating to environmental change or public health, long-term monitoring is essential to produce a useful data set. Established data-sets must be maintained, up-dated, and made widely available.

>> **Ensure that scientific data collected is of the highest quality.** If data are to be used as a sound basis for informing national or international policy, data collection methods must comply with international standards. Data collection and dissemination must be undertaken in total transparency to ensure its acceptance as a legitimate support to local, national, and international decision making.

>> **Encourage closer involvement of the media as a bridge between scientists, decision makers, and the public.** Converting and diffusing the information derived from scientific data into relevant public action requires an intermediary that can be trusted. Efforts should be made to improve communication between scientists and journalists and other stakeholder groups to ensure that each party understands the constraints of the other and can better evaluate the relevance of the scientific information to specific local situations.

>> **Carry out research and development on new and more inclusive governance mechanisms at local, national, and international levels for the information society.** ICTs provide new opportunities to include all stakeholders, including people from the communities directly affected, in policy formation and problem management. Effective and efficient strategies for participatory decision making should be identified and developed.

Mapping public health

The recent emergence of severe acute respiratory syndrome (SARS) underlines the importance of ensuring that responsible authorities are adequately prepared to accurately report major public health risks. It also highlights the important role of the media in raising public awareness.

Maintaining careful and consistent disease surveillance across the globe is fundamental to ensuring that alert and response systems can be initiated and action taken at the first signs of an epidemic. Many countries still lack an effective, real-time disease surveillance system. As a result, epidemics of both emergent and known diseases can have devastating effects.

By providing an interface between data and maps, geographic information systems (GIS) play a vital role in the detection of and response to health problems. HealthMap, an interactive information and mapping system developed by the World Health Organization, strengthens data collection, management, and dissemination to support public health activities and decision making. www.who.int/emc/healthmap/HealthMap.pdf

Communicating science

Effective science communication plays a vital role in informing public opinion on the scientific issues that underlie decision making, whether it be regarding new claims by a drug company or a government announcement on irrigation.

In many developing countries, the lack of communication infrastructure makes it particularly difficult for science journalists to respond quickly to scientific and health-related stories. In addition, they often lack access to the reliable background information and sources of informed opinion they need to report accurately and authoritatively.

The Science Development Network, SciDev.net, provides a free-access source of online news and analysis about the role of science and technology in addressing the needs of developing countries. The Network also offers workshops and training sessions for journalists and public information officers, designed to build capacity in science and technology communication and create opportunities to share best practices. www.scidev.net

SCIENCE IN THE INFORMATION SOCIETY

In March 2003, more than 60 invited experts—leading scientists and representatives of international organizations—gathered at UNESCO in Paris to consider the role of science in the information society.[1] Participants developed an overall **Agenda for Action** for consideration by all parties interested in using information and communication technologies (ICTs) for a better society.

AGENDA FOR ACTION

>> Ensure that all universities and research institutions have affordable and reliable high-speed Internet connections to support their critical role in information and knowledge production, education and training.

>> Promote sustainable capacity building and education initiatives to ensure that all countries can benefit from the new opportunities offered by information and communication technologies (ICTs) for the production and sharing of scientific information and data.

>> Ensure that any legislation on database protection guarantees full and open access to data created with public funding. In addition, restrictions on proprietary data should be designed to maximize availability for academic research and teaching purposes.

>> Promote interoperability principles and metadata standards to facilitate cooperation and effective use of collected information and data.

>> Provide long-term support for the systematic collection, preservation, and provision of essential digital data in all countries.

>> Promote electronic publishing, differential pricing schemes, and appropriate open source initiatives to make scientific information accessible on an equitable basis.

>> Encourage initiatives to increase scientific literacy and awareness of how to interpret web-based scientific information.

>> Support urgently needed research on the use of information technologies in key areas, such as geographical information systems and telemedicine, and on the socio-economic value of public domain information and open access systems.

>> Recognize the important role for science in developing and implementing the new governance mechanisms that are necessary in the information society.

1. Further information on the workshop can be found at www.icsu.org and www.codata.org. See also www.unesco.org/wsis.

INTERNATIONAL COUNCIL FOR SCIENCE (ICSU)
51 Bd de Montmorency, 75016 Paris, France
tel: (33 1) 45 25 03 29
fax: (33 1) 42 88 94 31
e-mail: secretariat@icsu.org
http://www.icsu.org

Strengthening international science for the benefit of society.

Founded in 1931, ICSU is a non-governmental organization representing a global membership that includes both national scientific bodies (101 members) and international scientific unions (27 members).