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Institute on Comparative Regional Integration Studies



Future Trends Series - GR:REEN Project

Title of the report

ICSU Foresight Analysis; Report 1 International science in 2031 – exploratory scenarios

Area

Science & Technology

Reporter

International Council for Sciences (ICSU)

Type of the Reporter

Non-Governmental Organisation

Periodically updated?

No

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2011

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Official website

<http://www.icsu.org/about-icsu/strategic-priorities/foresight-analysis/foresightreport1.pdf>

Language available

English

Short summary

“The purpose of this project was to explore how international science might develop over the coming two decades in a changing economic, social, political and environmental context. ICSU has used this foresight process to test its role and mission and to guide long-term strategic choices aimed at strengthening international science for the benefit of society. This project focuses on two key questions:

- What will be the key drivers influencing international science in the next 20 years?
- How can international science collaboration be supported to help science progress and benefit society in the next 20 years?”

Key trends

- **“Demography:** The figures for global population growth over the next 20 years can be predicted with some confidence. This overall growth will be combined with a changing spatial and age distribution that will differ across regions. The impacts of migration are less clear than population growth but the overall move from rural to urban areas, especially in developing countries, is a well established trend”;
- **“Natural resource availability:** Population growth will impact on those resources that are finite. In particular, there will be increasing pressure on water availability, both for drinking and for agriculture. The production of food will be a challenge as the availability of fertile land is limited, a situation that is exacerbated by the degradation of natural ecosystems. There will be increasing demand on finite

sources of energy, with fossil fuels having to be extracted from previously unexploited locations. Other rare materials are also being used at rates which are unsustainable”;

- **“Global environmental change:** The impact of human behaviour on the state of the planet is being increasingly understood and mapped. Data on oceans, ecosystems, the cryosphere and the atmosphere are now available to show what this is likely to mean if environmental change continues at its present rate”;

- **“Human health and wellbeing:** As the population expands and urbanization increases the prevalence of non-communicable diseases related to sedentary lifestyles and obesity is increasing. At the same time, communicable diseases will remain a challenge and the likelihood of global pandemics may increase as international travel and trade facilitate the spread of infectious agents”;

- **“Technological change:** The impact of technological change on society is more difficult to predict than some of the other megatrends. However, the exponential increase in the rate of technological change is a pattern that is likely to continue for the next 20 years. Forecasting specific technological developments over two decades is very uncertain but the speed of innovation and change is more predictable”;

- **“Enabling information and communication technologies:** Information and communication technologies (ICTs) will continue to have a significant impact both in developing and developed countries. Like other technologies the rate of change will continue to increase and new ICTs will surely make a major difference to the functioning of societies over the next twenty years. There will be new ways of communicating and social networking – with implications for science and the production and maintenance of the scientific record.”

Suggestions

“Exploratory Scenario 1 – The triumph of globalism

- While states have taken the lead in establishing this new global order, the emergence of an active global citizenry, together with a newly invigorated UN system, has played an important role in the formation of new issue-focused networks that tackle a range of pressing grand challenges around energy, food, environment, health and poverty.
- Science acts as a global stabilizing agent in this new global order, is an integral part of a functioning global society and helps to drive global political agendas. It is policy relevant and provides influential inputs to decision-making at global and national level.
- The spirit of cooperation and global solidarity is also reflected at the non-governmental level, with academies and funding agencies pushing for a single, strong organization to represent the independent voice of global science. A global strategic science funding body, combining 2% of each nation’s allocated public research funding, has been launched to tackle grand challenges on a global scale.

Exploratory Scenario 2 – Science supplying national needs

- After a series of major global economic crises over the preceding two decades, there is public disenchantment with globalization and a strong push towards new localized growth models with sustainability at their core.
- The goal is to be more self-sufficient, to increase local production for internal and regional markets, and to improve quality of life and societal satisfaction, rather than growth per se. At the same time, efforts to build effective global governance structures have largely failed and instead, complex national and supranational regional alliances have formed among states, businesses and civic groups to address pressing challenges. Diverse national and regional solutions prosper in a widely experimental society.
- In the absence of large-scale global collaboration, bilateral and regional alliances are strong players in the international science arena. The global governance of science at the intergovernmental level is fractured.

Exploratory Scenario 3 – Science for sale in a global market place

- The global free-market economy reigns and intense levels of interaction occur between economic agents across national borders. Thousands of multinational companies constitute powerful international players and drive the ever-faster pace of globalization.
- Societies in the developed economies are hyper-consumerist, with much of their consumption focused on improving health and lifestyles, to which science makes essential contributions. In this way, society’s relationship with science is mediated through its consumer behaviour. But access is limited to those who can afford to pay, and with a widening gap between rich and poor, many are excluded. Partly in reaction, a variety of well organized and active anti-globalization movements have emerged, some of them rooted

in religious fundamentalism and extreme forms of nationalism. These are hostile to science, which is portrayed as part of an uncaring global capitalism package.

- Globalization has also extended to universities and e-training has become an important, and less expensive, means of education in the less developed world. While hailed as progress by many, the global availability of such services acts to obstruct the development of indigenous tertiary education and associated research capabilities, and contributes to further 'brain drain' towards the more economically advanced countries.
- Global governance structures for science are dominated by business and economic interests. This is apparent across both inter-governmental and non-governmental structures. It is difficult for these bodies to maintain independent missions in the light of the shortage of public funding and abundance of private funding.

Exploratory Scenario 4 – Rise of aggressive nationalism

- With the rise of the new and emerging economies, an ongoing power struggle for global leadership and resources has created a great deal of uncertainty and instability in the international state system. Largely unresolved sustainable development issues and the competition for finite resources present a potential trigger for war. In the uncertain geopolitical environment, nation states are the key actors. Economic powerhouses, including the USA, Germany and a number of the newly industrialized countries, act as leadership poles and dominate international decision-making structures. With an increase in international tensions, the economies of the leading powers are largely driven by national military-industrial complexes.

- National investments in science and technology are increasing in the economic powerhouses, but other countries have fallen far behind. The less developed countries are isolated from the scientific endeavour and maintaining the Universality of Science is a major challenge, with threats both to the freedom and mobility of scientists. International coordination and global funding sources are scarce, and the willingness to join forces in addressing global climate change and sustainable development challenges has all but disappeared.

- There is a culture of secrecy and lack of transparency and openness affecting all walks of life, and science is not immune to this. Countries have placed heavy barriers to the international exchange of knowledge, so that parallel research efforts flourish within nodes of strong national science.

- In the atmosphere of tension and intense competition, large countries like China, the Francophone world and the Spanish-speaking countries have begun to promote the use of national languages for scientific communication, with the ability to speak English becoming less of an advantage and bond within the global science community. The mobility of researchers and students has declined, and countries mainly rely on their own educational resources to train the next generations.

- International governance structures for science are dominated by the most economically powerful nations. A plethora of different global non-governmental organizations for science has evolved, but the majority of these are not truly independent but rather serve as instruments for the global ambitions of individual countries."

Methodology

Research from primary and secondary sources

Projections and Modelling

Reference to other trends reports? If yes, which reports?

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