

Coordinated global change research – the ICSU perspective

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Bottom-up collaboration between scientists across borders is expanding, as shown by authorship analyses. It is also fruitful, since publications with authors from several countries have, on the average, higher impact than single-country papers. Coordinated international collaboration is needed to address complex problems in a strategic and interdisciplinary fashion. The International Council for Science (ICSU) organized the International Geophysical Year in 1957, which fostered research in global environmental change from the geosciences perspective. The scope of research interest soon expanded, first into other “hard” natural sciences, then into biological and ecological sciences, and finally into social sciences. To coordinate international research, ICSU with partners set up four interdisciplinary programs, with the focus first on climate (WCRP), then on the geosphere-biosphere (IGBP), ecology and biodiversity (Diversitas), and finally the the human dimension (IHDP). These programs produced most of the science reviewed by the IPCC in its assessments and advice to policymakers.

However, an expert review of the four programs indicated that they did not strategically address urgent issues important for society related to global change, that there were gaps and overlaps, and that a coordination structure set up by the programs themselves (ESSP) had failed. Therefore, ICSU decided to fuse the programs into a new research framework, Future Earth, launched in 2014 (WCRP decided to remain independent under WMO). The International Social Sciences Council (ISSC), UNEP, UNESCO, UNU, and the Belmont Group (formed by the major funding agencies) joined as partners. The guiding principles of the new program are true interdisciplinarity (including the social sciences and humanities), production of knowledge that society needs for action to meet the challenges of global change, and co-design and co-production of knowledge with end-users. As the old programs are closed, most of their Core Projects have joined Future Earth, with the expectation that they would adopt similar principles.

Future Earth is still struggling with getting organized and raising funds. However, a strategic research agenda has been adopted and eight major challenges identified, including food and water, biodiversity and ecosystem services, urbanization, sustainable consumption and production, and human health. These will be the themes of new collaborative research structures called Knowledge-Action-Networks (KANs), which will invite interested research groups and programs world-wide to participate. After several decades of experience on planning and evaluating international research programs, ICSU has learned some lessons. Interdisciplinary research is essential but difficult to achieve without a determined effort, and there is still room for competent disciplinary work. All programs should have a sunset clause, in the case of Future Earth a ten-year life span followed by a review. Co-design is important for truly engaging with societal partners, but not relevant in all situations. Governance of research programs should be light and flexible, preferably managed by an International Program Office and guided by a Scientific Steering Committee. Early career scientists should be recruited, not only to perform research but also participate in planning.