International Group of
Funding Agencies for
Global Change Research

IGFA

National Updates

Wenner-Gren Center
Stockholm, Sweden
October 21 - 24, 2001

The goal of the **International Group of Funding Agencies for Global Change Research (IGFA)** is to foster Global Change Research. IGFA is a forum through which national agencies that fund Research on Global Change identify issues of mutual interest and ways to address these through national and when appropriate through coordinated international actions.

Important issues for consideration in IGFA include:

- information exchange about national global change research programs, as well as about supporting initiatives and facilities;
- approaches to the integration and implementation of global change research;
- optimal allocations of available resources for global change research and its international coordination;
- infrastructural topics of mutual interest, including data accessibility and observation systems;
- ways to improve the interaction between science and policy; and
- possible fields of action for the future in the light of a constantly changing scientific landscape, *e.g.* changing scopes of the international research programs.

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FUNDING TRENDS 2001

INTRODUCTION

The IGFA Plenary 2001 took place in Stockholm, Sweden, October 21st – 24th 2001.

Presentations on relevant developments in the countries have a prominent place on the agenda of the annual plenary meeting of IGFA. Representatives submit brief written communications and deliver brief oral presentations. The presentations give insight in the position of global change research on the national policy agendas, in funding structures and trends in funding of global change research in IGFA member countries.

Taking into account that there had been a relatively detailed overview of funding levels in 2000, members this year were asked to provide information on trends in funding compared to last year, and on major changes or new developments.

AUSTRIA

1. Funding levels for GCR

In general, funding levels for GC have not yet changed. Nevertheless, there are two main changes in the Austrian research landscape that will presumably alter funding levels in the near future:

In 2000 a new „Austrian Council for Research and Development“ was established, whose agenda comprehends the whole national innovation system. The main aim of the council is to foster Austria's technology competence. Funding institutions were called to submit proposals for long term research programs. Unfortunately, the planned new long term research program „EcoForesightsAustria“ of our Department, which, to a major degree, was to concentrate on regional global change monitoring, mitigation and adaptation, did not receive funding yet and we are not very optimistic for the near future. The program would have brought a tremendous increase of GC relevant funding in Austria. Moreover, also due to a decision of the research council, commissioned research per se has been cut zero, which will also have impact on national GC relevant research. Nevertheless, the so called „Bund-Bundesländer-Kooperation“ (Federation-Province-Cooperation), to a certain degree GC relevant, will receive stable funding in the near future.

The second change concerns the research agenda of the newly formed Ministry of Agriculture and Forestry, Environment and Water Management. At the moment, the Ministry is finishing its new 5 year research plan, which, to a certain degree, appears to be GC relevant. This research plan also has to be submitted to the research council first.

2. National mechanisms for supporting integration and co-ordination of international co-operation in GCR (‚Glue Money')

„Glue money“ funding has not changed since last year.

3. Some selected news and developments

The 2nd phase of the inter-/transdisciplinary program „Austrian Landscape Research“ is well underway (www.klf.at), for details see 1999 and 2000 updates). This year, as part of the „synthesis budget line“ a call for tender for projects aiming at networking with DIVERSITAS, IHDP, MAB, IGBP (Mountain Research Initiative) and the Millennium Ecosystem Assessment, has been announced.

The GLORIA initiative (Global Observation Research Initiative in Alpine Environments), funded by and/or embedded into IGBP, GTOS, The European Commission, European Environment Agency, DIVERSITAS, Austrian Academy of Sciences, Austrian Federal Ministry of Education, Science and Culture is well under way and has come up with the latest version of the multi-summit approach field manual recently.

A new net-node „Long Term Ecological Research Austria“ of the Austrian Network of Environmental Research (http://nuf.boku.ac.at) has been established at the beginning of 2001. The net-node LTER-Austria has been initiated as an interface between Political Administration and the Scientific Community in order to facilitate the exchange of information and to promote innovative research in the field of ecology. The net-node is currently analyzing the status of long-term ecological research in Austria.

The results of this analysis will serve as a basis for the development of future projects. The project aims at establishing an Austrian Network of Ecological Long-term Research which will focus on the monitoring of changes of ecosystems and ecosystem-processes. Furthermore it will be tried to strengthen the international ties of LTER and to integrate the Austrian LTER in international networks, such as the ILTER.

The ANER net-node „Human Dimensions of Global Change Austria“ prepares to announce a prize for the „Best Human Dimensions Doctoral Thesis“. The prize aims at directing socio-economic doctoral theses towards the „Human Dimensions“ field. Therefore, to gain the desired effect, the best concepts, and not the finished theses, will be rewarded.

Among initiatives which are not part of the Austrian Landscape Research program the studies „Scenarios of climate change and impacts on the hydrology of Austria“ as well as the modeling approach „Austrian Carbon Balance Model“, which is a comprehensive dynamic full carbon accounting and also includes policy scenario analyses until 2010, have recently been finished.

As part of application oriented GC research, the guide „Forest in Change – On the example of the continental east of Austria“ has been published. The guide is supposed to give additional help to forest owners, forest wardens and other persons working in Eastern Austria to take suitable silvicultural measures in view of the prognosticated climate change.

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CHINA

1. Global Change Research Funding in China

In China, funding agencies relative to Global Change Research includes the National Natural Science Foundation of China (NSFC), Ministry of Science and Technology, Chinese Academy of Science (CAS) and several other administrations. In 1999, a total of about 147 millions USD was funded to Global Change Research in the country. The funded projects cover nearly all the themes in the Global Change Sciences and most of them are centered on studies relative to GCTE, GLOBEC, WCRP, PAGES, DIVERSITAS, LOICZ, and LUCC. This sum does not include overhead costs and the typical costs of a man-year for global change scientist, which is estimated to be about 7,300 USD for individual scientist.

Within the overall budget for Global Change Research, more than 5% is used for supporting international research integration and coordination. Moreover, the various institutions and administrations have allocated special funds for international scientific cooperation, including those relative with global change research.

The National Natural Science Foundation of China is one of the main national scientific funding agencies in China. Research is supported in the NSFC through three levels: major projects, important projects and ordinary projects. NSFC supports fundamental researches on these themes, rather than application sciences. Global change researches have been proven as one of the proprietary domains of the NSFC over the several past national five-year programs. Although some other funding agencies also fund global change researches, they are in close coordination with the NSFC. The scientific policy of the NSFC is mainly dependent of the various advisory panels of scientists. These advisory panels are in close collaboration with the NSFC leaders or department leaders. All the project proposals have to experienced several scientific evaluations. Moreover, funding decisions are usually made through the coordination with the other main funding agencies to avoid overlaps.

The Chinese national committee of IGBP (CNC-IGBP) is the main scientific organization for Global Change Research. The committee contains several working groups and consists of a great proportion of the leaders from the main national funding agencies and includes also a great number of scientists in the fields of global change.

2. Perspective of Global Change Research Funding

For the next national five-year program, Global Change Research remains to be the proprietary fields for all the funding agencies. Increasing budgets will be contributed to these fields. The purposes are to promote the developments of these scientific disciplines, to address those issues that are helpful to avoid the degradation of environments during the economic development, and to promote capacity buildings. Agricultural related researches are among the most important domains of the NSFC.

In the NSFC, a research program of Global Change Research is being planed for the next five years. This program is expected to play an important role in promoting the global changes researches in China through its scientific plans. The main themes of the program will be centered on:

- Past environmental changes

- Climate variability and predictability
- Changes of margin seas
- Hydrological changes in China and its role in global changes
- Geo- biochemical cycles and greenhouse gases
- Human impact on environments

GERMANY

Global Change Research (GCR) in Germany is mainly funded by the Federal Ministry of Education and Research (BMBF) and the Deutsche Forschungsgemeinschaft (DFG). The total amount of GCR-funding over the years 1999 – 2001 is stable with minor shifts between funding agencies and programs.

BMBF has continued the implementation process of its GCR-programs already mentioned in the last National Update:

AFO 2000:

The Atmospheric Research Program AFO 2000 has started full operation in 2001. The research work is grouped in four clusters:

Surface – Atmosphere Interactions, Chemistry-Dynamics Interactions, Gas-Liquid-Solid-Phase Interactions, Overall Synthesis. The annual budget for AFO 2000 is approximately 20 Mio. DM. Special attention is paid to the support of young scientists.

A kick-off-meeting took place in April 2001 and a Project Plan was published, which is also available in the web: http://www.gsf.de/ptukf/afo_2000/.

DEKLIM:

An important part of the support of German climate research is the new program DEKLIM (Deutsches Klimaforschungsprogramm) with the title „Climate development – from understanding variability to forecasting“. It is funded by the Ministry of Education and Research (BMBF).

DEKLIM is focused on an improved understanding of natural climate variability and of the stability of the climate system as a requirement for identifying the influence of mankind on the climate. Five programmatic objects deal with climate variability (including palaeoclimatological investigations in combination with climate modeling), regional process studies in the Baltic region, climate impact research, methodological aspects of the advanced development of climate models (using available experimental data under consideration of concrete applications) and the promotion of young scientists in the field of climate research. Special aspects were an intensification of scientific network co-operation, coupling of data and models and a stronger interaction with international research programs.

Projects of climate impact research and promotion of young scientists have started since the beginning of 2001. The kick-off meeting for the research activities in the field of climate variability, regional process studies and climate modeling is planned for February, 2002.

The amount of yearly funding is in the order of about 20 Mio. DM.

For further information see http://www.dlr.de/PT/Umwelt/UF_home.htm

BIOLOG:

The scientific program BIOLOG (Biodiversity and Global Change) has been established by the Federal Ministry of Education and Research of Germany (BMBF) to promote nationally and internationally coordinated research in the context of global

change and decreasing biodiversity. BIOLOG is an interdisciplinary cooperative research program aiming at achieving conservation and sustainable utilization of vital biological resources. BIOLOG is drafted in total to run for nine years. The first three-year-running funding period began in 2000 with an annual budget of some 20 Mio. DM. It focuses on two major areas of research: terrestrial biodiversity and biodiversity informatics.

For more information see www.dlr.de/PT/Umwelt/F70000/F73000/F73000.htm.

GLOWA:

The aim of GLOWA (Global Change in the Hydrological Cycle) is the development of strategies for sustainable and future-oriented water management on a regional level while taking into account global environmental changes and socio-economic framework conditions. The following 4 GLOWA projects were launched by BMBF in 2000 (total annual budget 13 Mio. DM):

- IMPETUS (catchment areas of the rivers Drâa /Morocco and Ouémé /Benin)
- GLOWA – Volta (Volta basin: case study in Ghana and Burkina Faso)
- GLOWA – Elbe
- GLOWA – Danube

For more information see: www.glowa.org

The implementation of the Program Geotechnology – a joint BMBF/DFG-Program – is successfully continued in the year 2001.

The DFG has established a new research center on ocean margins at Bremen and several centers of excellence on biodiversity in tropical mountain rain forests, ocean passages and the biogeochemistry of the wadden seas as well as graduate colleges on biodiversity and paleo-studies and a new priority program on the genesis of biodiversity.

ICELAND

1. The annual meeting of the Icelandic Research Council was held on April 9th. The theme was Research Excellence in a Global Context. The Guest speaker was Prof. Reijo Vihko, President of the Academy of Finland who spoke on Science and Technology Policy in Finland. The minister of education, science and culture, Bjorn Bjarnason addressed the meeting and announced that he intended to present a bill of law to the Althing next fall changing the structure of the Icelandic Research Council to include 6 ministers under the chairmanship of the Prime Minster. The funding of science and innovation is to be given to two separate funding organizations reporting respectively to the minister of education and the minister of industry and trade. The details of these organizations are not explained. The model he claims to have in mind is the present structure in Finland. The reaction of the science community is mixed although some positive views towards a ministerial policy council have been expressed.
2. The Icelandic Research Council announced new figures for R&D spending in Iceland based on the biannual survey of 1999. According to this a total 14.000 M.ISK were spent on R&D in 1999 in Iceland. This represents 2.25% of the Gross Domestic Product and was the 6th highest reported among OECD countries. This is considerably higher than earlier forecast and is explained mainly by new industrial R&D investments in human genomics biotechnology as well as the building of a new research vessel, RS Árni Friðriksson, named after the well known Icelandic oceanographer/marine biologist, who became director of ICES. The average annual growth in R&D spending over last decade has been 12.8% per annum overall and 23.7% in the private sector alone.
3. The Icelandic Research Council in cooperation with the ministry of education and the US Embassy in Iceland prepared a US – Icelandic Science Day on the 13th of September in connection with an international symposium on geological aspects of Iceland. The theme of the Science Day was to be North-Atlantic Science Connections, i.e. science policy concerning research on environmental issues, and the genomics of human health in the North-Atlantic region. Due to the tragic events in USA on 11th of September, the meeting was cancelled. There are, however, plans to organize a similar meeting or congress in May 2002. The Congress will be on Trans-Atlantic science connection with special focus on environmental issues, such as global change issues, climate variability and change in the Arctic region.
4. The Icelandic Research Council recently announced a change in its grant policies for the Science Fund. A new category of larger grants, 5-10 MIKR is offered to outstanding research groups to promote research excellence and more ambitious projects in fundamental research with the view of meeting increasing international trends towards supporting "Centers of Excellence". The measure is also intended to counteract the eroding purchasing power of the traditionally small grants to individual scientists awarded by the Science Fund. The Council intends to reserve up to 25% of its available funds for this scheme, which will reduce the total number of other types of grants considerably unless further appropriations will be forthcoming. The Council chairman and director have recently met individually with 6 ministers to explain the new grant policy and seek government understanding for its consequences.

The Icelandic Research Council announced a preliminary application procedure for prescreening with expiration date of October 1. A total of 19 applications were received in the various major fields of science as follows:

Field of science	Preliminary Applications
Humanities	3
Social Science	2
Biomedical Science	7
Natural and Environmental Science	7

The final application date coincided with the normal 1. November deadline. A total of 19 applications were received in fields of science as follows:

Field of science	Applications
Humanities	2
Social Science	1
Biomedical Science	7
Natural and Environmental Science	8
Materials and Industrial Technology	1

Within the field natural and environmental sciences, all the applications are in English, and the aim is to get them evaluated abroad, in Europe and USA. The council would surely appreciate help from NOS-N on this matter.

5. The Prime Minister, David Oddsson, in his policy speech to the public this month in connection with the convening of the fall session of Althing praised the results that investments in R&D have produced in recent years announced the governments intention to transfer the overall responsibility for science and technology policy to the Prime Ministers Office. A new structure (a science and technology policy council) would include ministers and representatives of the scientific community and industry. The economic policy document presented to the first session of the Althing last Monday with the budget proposal for 2002 is based on three explicit policy pillars: (1) state fiscal policies, (2) monetary policies, and (3) science, research and development. This represents a new stage for the science and technology in the economic policies of the Icelandic government.

THE NETHERLANDS

General

The past year brought major events on global change research to The Netherlands. Amsterdam hosted the **Open Science Conference** of IGBP and the other international programmes in July.

In August, the University of Utrecht hosted the **Climate Conference**, which covered the whole area of WCRP and was the largest WCRP meeting since the 1998 CLIVAR conference in Paris.

This year, the Dutch **National Research Programme** on Climate Change is coming to the end of its second phase which lasted 5 years. The programme was funded by NWO and the Ministry of Environment at a level of about 5 million Euro per year. The follow-up of this programme is still in clouds. The budget of the Ministry of Environment for climate change research in the next years is at a lower level than it has been over the last ten years.

The NWO Research Council on Earth and Life Sciences **continues to maintain its efforts** on global change research:

- a budget is reserved for participation in the Eurocore on Continental Margins;
- a Dutch contribution to LOICZ is started aimed at the North Sea coastal waters and the lower reaches of the river Rhine, and together with the Flemish Science Foundation at the river Scheldt estuary ;
- a second phase of the Dutch programme on Climate Variability has been started.

The NWO foundation for computing facilities NCF added a new teraflop **supercomputer** to its facilities, which (at least by then) was the most powerful computer in Europe. These national facilities are important assets for e.g. the climate modellers. Recently, NCF advised the atmospheric science community about options for a multi-teraflop European collaboration on supercomputing.

Another important event for the global change community was that the Dutch glaciologist Hans Oerlemans was awarded the Spinoza-prize, amounting 1.5 million Euro, which Oerlemans plans to spend for further investigation of the Greenland ice-cap.

On the issue of **glue money** NWO signed up the IGFA Statement on the Mode of Operation. This is put into practice by adding a new line in the budgets for the new Dutch LOICZ-programmes which reserves 2% of the total budget for the IPO concerned. Substantial funds were raised to sponsor the Open Science Conference. The special glue money fund for integrating activities by the international programmes was used for sponsoring one of the IGBP-workshops.

With regard to co-operation with **developing countries and capacity building**, the programmes for co-operation with several countries in SE Asia are coming to an end. Plans for continuation are being developed.

New programmes

NWO announced in a new strategic plan a major theme ‘System Earth’. This theme overarches a wide range of disciplinary programmes related to global change. The ambitious goal is a funding level of 14 million Euro per year. Part of the programmes are already in progress, but funding for the new parts is not yet secured since again public funds for science are not increased in the national budget for 2002.

Under the theme System Earth the following issues are included:

- Climate variability
- Continent-Ocean boundaries, aiming at plate tectonics and related surface processes
- The coupled geo-biosphere, in particular aiming at improving the knowledge on proxies
- Water, in particular river systems, groundwater and coastal systems, including in tropical areas
- Energy and material use, including fostering of efficient use, new technologies like hydrogen cell and catalytic processes.

Additionally, ambitious new plans are being developed on:

- joining the research on the thermohaline circulation in the North Atlantic
- monitoring carbon and other fluxes in terrestrial systems

Whether funding for these plans can be obtained is still very uncertain.

An issue that also requires attention and budgets is the continuation of participation in the Ocean Drilling Programme, and the question of joining continental and lake drilling programmes.

NORWAY

Funding trend 1999 ® 2000:

As reported in the 2000 National Report, there was a substantial increase in the Research Council of Norway's (RCN) funds for climate research in 2000. The increase for GCR in general is estimated at approximately 15%.

Funding trend 2000 ® 2001:

Relatively stable or marginal increase.

Comments on the prospects for the future:

In a recent white paper on the Norwegian climate policy, the Government strongly indicates a continued increase in the funding for research related to climate change.

Survey of GCR funded by the Research Council:

The Norwegian Global Change Committee has made an inventory of global change research (GCR) projects funded by the Research Council of Norway (RCN) in 2001. In lack of a rigid definition, GCR was defined as research that can be considered relevant to the science agenda of the four major international global change programmes DIVERSITAS, IGBP, IHDP and WCRP[1]. Relevance was judged based on the objectives stated for each of the international programmes and their core projects. It was not attempted to check whether the projects had any kind of link to the programmes they were considered relevant for.

Main findings:

The grants provided by the RCN in 2001 to GCR as defined above amounts to approx. 77 mill. NOK. Table S1 shows this amount split on the four international global change programmes.

Table S1. Grants from RCN to GCR in 2001 (mill. NOK)

Projects relevant to DIVERSITAS	11,9
Projects relevant to IGBP	18,1
Projects relevant to IHDP	17,9
Projects relevant to WCRP	29,0
Total	76,9

Comments:

1. Please note that the total figure (ca. 77 MNOK) from this survey is not directly comparable to the figure that was reported to IGFA for 1999 (ca. 89 MNOK), as a

[1] As a consequence, many research areas of relevance to global change were not included in the survey.

wider definition of GCR was used that time. As stated above the reality is that the funding has increased – not decreased.

2. Based on a recent survey on climate change research it is reasonable to estimate that the RCN finances between 30 and 40 % of all GCR in Norway. Accordingly, the total value of Norwegian research relevant to the four international global change programmes in 2001 can be estimated to 192 - 254 mill. NOK.

SOUTH AFRICA

As a developing country and new democracy, South Africa has immediate development issues (e.g. education, housing and health services) to address and therefore the national science budget is limited and more directed at local issues. In the context of Global Change Research (GCR) this has obvious implications. Generally speaking the South African science budget and the ever increasing gap in exchange rates between the South African and G7 currencies allow South African scientists to make only a limited contribution to GCR at the international level. South African scientists are really mandated and supported to apply global change science at the regional and national levels. However, local application must take place in the context of international global change science and hence a small number of South African scientists are financially supported to continue to play a constructive role at the international level.

There is not a dedicated national Global Change Research Programme in South Africa and although there is an ICSU affiliated National Global Change Committee, this committee does not have a budget to work with. Support for GCR is given to projects under cover of a more general environmental research programme or to *ad hoc* projects that are more often than not funded by international organisations. National funds for GCR increased slightly whereas the international funds for GCR research from diverse sources showed a more significant increase. Overall the financial situation appears to be stable. Climate Change Research remains the dominant focus of GCR and is funded at around ZAR 15 million. There is a need for capacity building in Climate Change Research and specifically with regards to the impacts of climate change on the economy. "The Heat Is On…." is a recently published booklet flowing from the South African Country Study on Climate Change. It raises awareness about the potential impacts of climate change on plant diversity at the biome level.

The pressure with regards to societal welfare that is exerted on South Africa's national budget has led to innovative approaches to environmental management and data collection. The Working for Water Programme (http://www-dwaf.pwv.gov.za/wfw/) seeks to sustainably control invading alien plants through the employment of previously unemployed persons in an attempt to combine environmental and social benefits in the programme. More than 300 projects aimed at physically removing invasive alien plants are being funded with a budget of *ca* US$ 30 million. The programme is under evaluation in an ongoing a research programme. The Bird Atlas (http://www.uct.ac.za/depts/stats/adu/p_sabap.htm) and Frog Atlas Projects (http://www.uct.ac.za/depts/stats/adu/bn7_2_15.htm) as well as the FISH-WATCH project (http://fishwatch.tripod.com/) are organised around voluntary support from the public with the gathering of data. These projects will provide invaluable baseline biodiversity data for GCR. They are examples of how all South African scientists have to be creative in order to develop low-cost budgets for their research projects as well as to demonstrate the social value of their work.

The National Research Foundation (NRF) supports and promotes research in all disciplines and funding is primarily granted to academics and their research students. The application process is a bottom-up one within a framework of nine multi-disciplinary focus areas (http://www.nrf.ac.za). GCR is particularly relevant in the Focus Area: Conservation & Management of Ecosystems & Biodiversity, but also in the Economic Growth, Sustainable Livelihoods and Globalisation Focus Areas. The NRF forms joint ventures and partnerships with local and international organisations, even to the extent of being a research management agency, in order to maximise its role.

NRF is also the South African member of ICSU to whom all the national ICSU committees report.

A number of other South African organisations support GCR to some measure. These would include various government ministries (environment, agriculture, water, forestry, education and science) and their associated research institutions. In South African terms, the national electricity supplier (ESKOM) gives significant support for climate research. The South African Data Centre for Oceanography (http://fred.csir.co.za/ematek/sadco/sadco.html) stores, retrieves and manipulates multi-disciplinary marine information from the Atlantic, Southern and Indian oceans around southern Africa.

New developments relevant to South African GCR are as follows:

- The World Summit on Sustainable Development (WSSD) to be held in South Africa in 2002. The WSSD already has an impact on approaches to research and development in South Africa and will have a positive influence on the funding for GCR. South Africa will also maximise the benefits from having a large contingent of scientists visiting the country by arranging appropriate opportunities for interaction with the South African GCR community.
- A Global Change Conference to be held in 2003 following on the previous which was held in 1995.
- A long-term ecological research initiative (LTER) to consist of a number of environmental observatories that will study the effects of climate change, land-use change and nutrient loading on biodiversity and production (http://www.nrf.ac.za/publications/news@nrf/aug2001/lter.stm).
- The launch of CAPE (Cape Action Plan for the Environment), an initiative to protect the endemic Cape Floral Kingdom under huge threat from urban and agricultural development, inclusive of a research programme (http://www.panda.org.za/megaprojects.htm#Cape).
- Completion of the fieldwork for the SAFARI 2000 Project, an international regional science initiative to explore, study and address linkages between land-atmosphere processes and the relationship of biogenic, pyrogenic or anthropogenic emissions and the consequences of their deposition to the functioning of the biogeophysical and biogeochemical systems of southern Africa.
- Launching of new research projects to develop models with regards to the viability of carbon sinks in South Africa.
- Moves are afoot to establish a Centre for Global Change Research in South Africa.
- The SA-ISIS programme (South African Integrated Spatial Information System) which includes an agricultural management and decision support system, a marine integrated development support system and a biodiversity monitoring and assessment programme (http://www.geospace.co.za/Isis) is nearing the end of a three year funding arrangement. It is not clear where further support will be obtained but the intention is that the SA-ISIS will form the information management backbone of the LTER initiative.

SPAIN

1. Funding levels for global change research (GCR)

In Spain there is not any specific program dedicated to the research in the area of the Global Change. The scientific and technological research, and therefore Global Change Research, is drove through the National Plan for R, D&I for the period 2000–2003, managed by the Spanish Ministry for Science and Technology, the only Funding Agency for Scientific Research at national level. This National Plan consists of several National Programs, one of this is the Natural Resources Research Program (REN) that deal with Atmosphere and Climate research, Marine Resources Research, Water Resources Research, Biodiversity and Terrestrial Ecosystems Research, Natural Risks Research, Antarctic Research and Technologies for Prevention and Treatment of Pollution. So the research in global change is included in many different parts within the National Plan.

During year 2000, the Spanish Government has expended nearly 12 million Euros in REN Program.

The subjects covered

- Climate observation and data collecting of greenhouse gases concentration
- Climate variability and predictability
- Simulation of processes and interactions regulating the climate change at regional scale (Biogeochemical cycles and processes regulating greenhouse gases emissions, better regional climate models)
- National scenarios for climate change
- Regional and global consequences of natural and mankind driven changes in the sea and the long term trends in marine ecosystems
- Marine ecosystems functioning
- Effects of Global Change in the quality, stocks and availability of water
- Conservation and integral management of water resources
- Biodiversity
- Effect of climate variability and land-use changes in biodiversity, land degradation and desertification
- New techniques and approaches for sustainable use, conservation and restoration of biodiversity

2. National mechanisms for supporting integration and co-ordination activities in GCR

This activity has been launched this year 2001 by enabling scientists and teams to come together into thematic networks (RT). Two RT are envisaged dealing with Global Change research: Global Change and Terrestrial Ecosystems, and Biodiversity and Genetic Variability.

3. Recent news and developments (highlights)

- A new IGBP Spanish Committee has been launched this year 2001. A web page has been built (in Spanish by now): http://www.eeza.csic.es/igbp/default.htm

  The new Committee is very active and now is developing a proposal for Medium Scale Global Change Research Facilities in Spain:

  1. Variability of climate-biogeochemical-biodiversity system observation long-term facility (REDESTEM) within the Global Observation System (GOS).
  2. National Centre for Teledetection (CENATE)
  3. Spanish Centre of Environmental Data (CEDA)
  4. Spanish Reference Centre for Biogeochemical Analysis (CERAB)

- A new push has been given to SCOPE Spanish Committee
- Spain has became a voting member of the Global Biodiversity Information Facility

SWEDEN

General country information

The general RaD funding trend in Sweden corresponds to a modest increase starting from a high level. (The Swedish RaD expenditures as part of GNP per capita is among the highest in the world – just around 4%, of which 1/3 is state funding). The environmental/sustainable development part keeps its share and has the last year belonged to the list of national priorities although at a somewhat lower financial level than e.g. biotechnology or information technology.

Sustainability connotations are referred to in many areas of research, e.g. in energy and in transport.

During the spring of 2001, Sweden held the EU presidency. It is in this context not without interest that Environment was one of the three presidency priorities (of the so called the "E"s. The others were the Extension of the EU to Central and Eastern Europe, and Employment). There is a strong interest from the Swedish side for involvement in the development of the new EU RaD programs (6th Framework Program, and the European Research Area (ERA) – linking EU and national efforts).

In the Global Change context, the strong interest in climate change continues at the political level. Effort to combine already ongoing but separate RaD efforts into some sort of national program has been initiated. Also the field of biodiversity (in a broad sense) has been given strong attention and in relative terms distinct boost of separately added financing from the Parliament. To which extent this new RaD funding will find some strong international component or only indirectly through Swedish RaD efforts is still unsettled. The tendency would be a strong domestic funding profile.

In the RaD organizational field, the year 2001 has been extremely active. It is the year in which the entirely new research funding organization has been set in place from the 1st of January. Around 12 "old" agencies have been merged into four much bigger ones. The "basic science" activities have been pooled into one body (the Swedish Research Council, Vetenskapsrådet) with responsibility for roughly half of the funding available in the group of four agencies, i.e. corresponding for the VR agency to around 200 M US-$ per year. Three other agencies deal with Sustainable Development (with outlets into the Environment, Agricultural Science, Building Research and Spatial Planning; FORMAS with around 50 M US-$ per year), social issues and the labor market (FAS), and Technical Development and Innovation in Industry (VINOVA).

Funding tendencies

The gradual "soft" increase in the RaD funding is connected both to the distribution among priority areas as well as a distribution between "levels" in the Swedish system. With regard to topical priorities the changes are not so drastic but a priority profile exists. With regard to the "levels" an increase in the RaD component for the more "regionally" based University Colleges and new universities is visible. Environment and in a broader sense Sustainable Development is on the priority list. The role of the Research Foundations, not the least those established on the basis of State money in the beginning of the 90ies continue to play a distinct role. In the environmental field MISTRA is the relevant Foundation. Also other Foundations play important roles especially with regard to infrastructure investments (e.g. the Wallenberg Foundation).

SWITZERLAND

1. International integration and co-ordination activities: MRI (Mountain Research Initiative of IGBP, IHDP, GTOS)

The SNF, the Federal Institute of Technology, the Federal Office of Education and Science, the Academy of Natural Sciences and the Federal Research Institute are co-financing the new MRI in Bern for an amount of 360 kFr. (211 kUSD/ 70,4 kUSD p.a.) (from July 2001-June 2003). The Office is based in Bern and hosted by PAGES-IPO and Swiss Academy of Natural Sciences.

2. National Centres of Competence in Research (NCCR)

In order to strengthen research and the application of research results to strategically important fields of research, the Swiss National Science Foundation took the initiative to create a new instrument of research promotion, the National Centres of Competence in Research. From the funding period 2000 to 2003, these will gradually replace the previous Swiss Priority Programmes, which will be superseded by the co-ordinated establishment of Centres of Competence and associated Networks. Special arrangements will be made to ensure the combination of theoretical research and practical application, particular emphasis being placed on fostering interdisciplinary approaches and creating links between research and teaching. Three NCCR focus on GCR or biodiversity:

a) *NCCR-Climate Variability, Predictability and Climate Risks*.

2001-2003 (planed 2011): 8.2 million SFr (4.81 million USD for the first three years).

b) *NCCR-North/South: Research partnership for mitigating syndromes of global change*

2001-2003 (planed 2011): 9 million SFr (5.3 million USD).

c) *NCCR-Plant Survival in Natural and Agricultural Ecosystems*

2001-2003 (planed 2011): 10.6 million SFr (6.2 million USD).

3. Priority programmes (PP)

The PP-environment (mentioned in the National Update of last year) is ending this year. The PP's are replaced by the NCCR's.

TAIWAN

1. Organizations for GCR

The National Science Council (NSC) is the main funding agency for global change research (GCR) in Taiwan. The principal offices of the NSC that run GCR programs include the Natural Science and Mathematical Division (NSMD), Life Science Division (LSD), Humanity and Social Science Division (HSSD) and the Commission on Sustainable Development Research (CSDR). The former three Divisions support fundamental research, and the CSDR actively promotes interdisciplinary-integrated programs and international collaboration in GCR. Other funding agencies, including the Environment Protection Administration, Ministry of Economics Affairs, Council on Agriculture, Ministry of Communication and Transportation, all carry out their own intramural or extramural research related to global change, and follow the guidelines of the Intergovernmental Panel on Climate Change (IPCC) to meet the United Nations Framework Convention on Climate Change (UNFCCC).

The National IGBP Committee coordinates the development of the major national GCR programs and interacts with international GCR programs such as GCTE, IGAC, JGOFS, LOICZ and PAGES. Figure 1 displays the interactions among the funding agency, research programs, IGBP National Committee and international organizations, related to GCR in Taiwan.

2. Funding levels for GCR

This report only presents the budget for GCR funded by the NSC. Annual budgets allocated to GCR programs and related research projects by the NSC have remained at US$ 3.1-3.5 million in FY 1999-2001. Table 1 shows the distribution of the funding across fundamental research, policy-making projects, and international collaboration. Funding of the core projects of international programs (which include WCRP, IGBP and IHDP) has been roughly maintained at US$ 2.5-2.8 million annually, while funding of strategic projects has gradually decreased. However, the budget for international collaboration significantly increased in FY 2001 owing to the support for START/SARCS (Southeast Asia Regional Committee for START). Other funding agencies contributed around US$ 6.0 - 7.0 million each year.

Table 1. Annual budget (in K US$) for GCR funded by the National Science Council in FY 1999-2001.

	FY 1999 (8/1999–7/2000)	FY 2000 (8/2000–7/2001)	FY2001 (8/2001–7/2002)
Research grants	2,800	2,660	2,520
Strategic projects	550	430	160
International collaborations	150	160	410
Total	3,500	3,250	3,090

3. Current Research Status and New Developments

Over one hundred scientists are currently involved in GCR programs. The basic philosophy of GCR programs in Taiwan is to “think globally, act locally” and funded projects are primarily aimed at understanding changes in Taiwan and its surrounding areas. Such work seeks (1) to understand the effect of global change on the local natural environment; (2) to collect regional data contributing to the understanding of the processes of global change; (3) to construct predictive, regional, environmental and climatic models; (4) to assist government and industry in complying with the international requirements related to global change, and (5) to assess the impact of climate and environmental changes, outlining viable strategies for a sustainable future.

Beginning in May 2001, the SARCS (Southeast Asia Regional Committee for START) Secretariat was moved from Bangkok to Taipei. The CSDR of the NSC provides all funds for the Secretariat’s operation, and will continue to do so over the next few years. An integrated study of “Sustainable Development Indicators for the Southeast Asia Region” is planned. The start-up fund is approximately US$ 300K. The CSDR will also take the lead role in setting up the regional research team to study indicators of sustainable development. Three to five research grants will be provided for applications from research institutes of Southeast Asian countries. The research will emphasize on

- Developing and implementing sustainable development indicators for the Southeast Asia region, and
- Promoting regional collaboration among Southeast Asian countries, and building the nations’ scientific capacity to contribute to GCR.

Dr. Maw-Kuen Wu

Vice-Chairman

National Science Council, Taipei, Taiwan

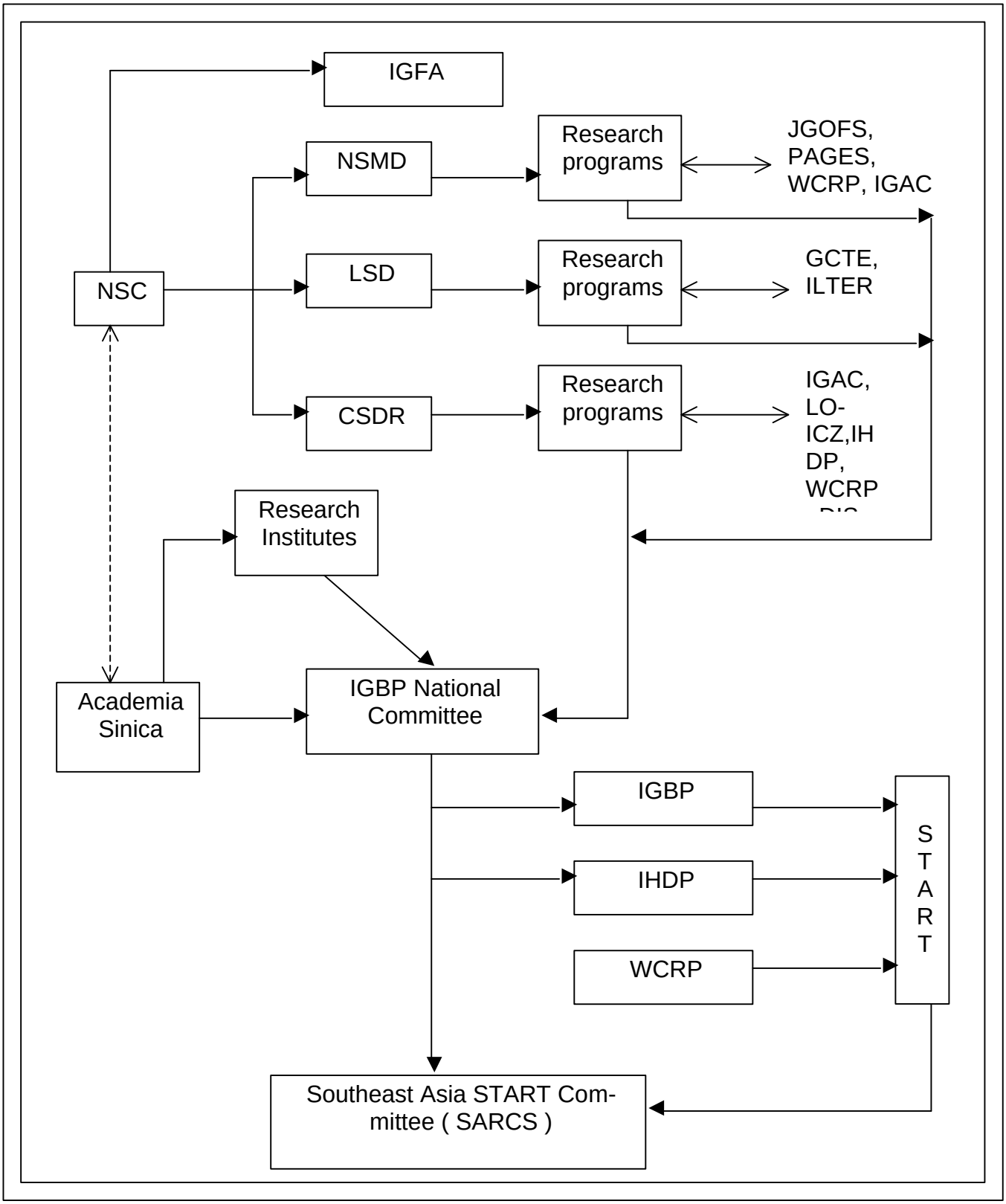

Figure 1. Interactions among the funding agencies, research programs, National IGBP Committee, international organizations, etc. in global change research in Taiwan. (NSC: National Science Council; NSMD: Natural Science and Mathematical Division; LSD: Life Science Division; CSDR: Commission on Sustainable Development Research)

General

It is rather difficult to comment on the levels of UK funding presently directed to global change research (GCR) owing to the 2001 general election and the rearrangement of Government departments which followed. The former Ministry of Agriculture, Fisheries and Food (MAFF), and the Department of Environment, Transport and the Regions (DETR) were reorganised to form the *Department for Environment, Food and Rural Affairs (DEFRA)*, and the *Department for Transport, Local Government and the Regions (DTLR)*. These new Departments and some associated agencies such as the Environment Agency are at present at different stages in the process of reviewing their research strategies.

DTLR has now published its 2001 Science and Innovation Strategy (see http://www.research.dtlr.gov.uk/sis2001/index.htm); DEFRA's aims and objectives are expected to be published soon. Any new priorities which are identified in this area, and details of the means by which the work devoted to it by the former DETR and MAFF will be carried on by their successors, DTLR and DEFRA, will become more apparent when all the new strategies are completed. It will not be possible to provide a useful national update on GCR funding until the next IGFA meeting.

Recent developments

The *Carbon Trust* began activity in April 2001: the Trust was set up under the auspices of DEFRA, but independent from it, as a not-for-profit company investing in a carbon return. The Trust is a major element of the UK's climate change programme. It will recycle around £130 million of receipts from the Climate Change Levy on energy used by industry and the public sector, by developing a range of programmes to promote low carbon research and development and help business invest in energy efficient, low carbon technologies and practices: see http://www.press.detr.gov.uk/0102/0067.htm.

In November 2000 the *Sustainable Technologies Initiative* was launched, a joint venture between Research Councils and the Government's Department of Trade and Industry (DTI). It is providing substantial funding over the next five years for collaborative projects to improve the sustainability of UK business, and aiming to achieve substantial improvements in the efficiency of material resource use. It is expected that initially at least, it will focus on the economic and environmental aspects; it is, therefore, primarily aimed at decoupling economic growth from adverse environmental impacts, such as emissions of greenhouse gases, waste production, and use of hazardous materials or, more generally, through poor efficiency in resource use. [http://www.dti.gov.uk/sti/index.htm]

November also saw the joint Research Councils' *Tyndall Centre for Climate Change Research* come into operation [http://www.tyndall.ac.uk/]. The Tyndall Centre brings together scientists, economists, engineers and social scientists, who together are working to develop sustainable responses to climate change through interdisciplinary research and dialogue on both a national and international level – not just within the research community, but also with business leaders, policy advisors, the media and the public in general. The Centre also receives DTI funds.

Other recent relevant programmes are from:

- the Natural Environment Research Council (NERC): *Rapid Climate Change*, a £20 million programme which will address climate change on decadal to centennial time scales, with a strong emphasis on the role of the ocean's thermohaline circulation in moderating the climate of NW Europe. [http://www.nerc.ac.uk/funding/thematics/rcc/].
- the Engineering and Physical Sciences Research Council (EPSRC):
  - *Towards a Sustainable Urban Environment* targets key quality of life indicators in water and air quality, waste and resources, transport, climate change, land use, construction and housing.
  - *Impacts of Climate Change on the Built Environment, Transport and Utilities* will undertake study of the potential long term impacts of climate change on the built environment, transport and utilities in the UK in the twenty-first century.
  - *Sustainable Power Generation and Supply* will support studies in the challenges of a sustainable power generation and supply infrastructure for the 21st century, under the themes of electricity networks and grid connection; biomass and biofuels; marine energy; and hydrogen technology.

  [for these programmes see http://www.epsrc.ac.uk/EPSRCWEB/DIPS/progs.htm]
- the Economic and Social Research Council (ESRC):
  - *Environment and Human Behaviour New Opportunities Programme,* a mechanism for synthesising existing research, and/or engaging in preliminary research to set the agenda for areas of future research investment. The illustrative, but not definitive, list includes Rapid Climate Change – Vulnerability, Adaptability and Resilience; Global Environmental Change and Food Systems; Sustainable Mobility & Human Behaviour; Urban Systems, Long Term Climate Change and Human Behaviour; and Tourism & the Environment. [http://www.esrc.ac.uk/Environment&HumanBehaviourProg.htm]

Emerging priorities

The UK Research Councils are currently engaged in making submissions to the forthcoming government Spending Review 2002 for research programmes entitled *Towards a Sustainable Energy Economy*; *Technology for Sustainable Development; Rural Economy and Land Use;* and *Health and the Environment.*

NERC is presently developing a new Science and Innovation Strategy, which builds on NERC's 1998 strategy by adding new priorities (e.g. genomics) and addressing relative priorities and how they will be implemented.

Sustainable development has been a key commitment in Government strategy since 1999, aiming to bring the environment, social progress and the economy alongside each other at the heart of policy making. Priorities include:

- the Review of Energy Research Across Government, which will form the basis of the Government's response to the Royal Commission on Environmental Pollution report *Energy – The Changing Climate.* [http://www.dti.gov.uk/renewable/ erag_review.htm]
- the DTI Renewable Energy Programme which aims to focus as much of its funding as possible on high quality, innovative industrial R&D projects that offer pros-

pects for improving the performance and/or reducing the cost of energy derived from renewable energy sources.
[http://www.dti.gov.uk/renewable/index.html]

- the DTI Sustainable Development Strategy for simultaneously securing economic growth and environmental protection.
[http://www.dti.gov.uk/sustainability/index.htm]
- the Sustainable Development Commission, the role of which is to advocate sustainable development across all sectors in the UK, review progress towards it, and build consensus on the actions needed if further progress is to be achieved.
[http://www.sd-commission.gov.uk/]

UNITED STATES

Funding levels for global change research:

The United States Global Change Research Program (USGCRP) supports research on the interactions of natural and human-induced changes in the global environment and their implications for society. The USGCRP focuses on four sets of interacting changes in the coupled human-environment system, a system that is undergoing change at a pace unprecedented in human history:

- Changes in the natural and human-induced forces affecting the Earth system;
- Changes and variability in Earth system attributes;
- Changes in ecosystems; and
- Changes in human communities, organizations, societies, and economies.

These changes are occurring on many time and spatial scales. Many feed-backs and interdependencies link them. The existence of many different types of forces complicate efforts to understand the interactions of human and natural systems and how these may affect the capacity of the Earth to sustain life over the long-term. Indeed, the interactions between changes in external (solar) forcing, human activities, and the intrinsic variability of the Earth's atmosphere, hydrosphere, and biosphere make understanding and projecting atmospheric and oceanic circulation, global energy and water cycles, and biogeochemical cycling among the most demanding scientific challenges.

Ten U.S. Federal agencies are involved in the USGCRP. They are the Department of Agriculture (USDA), the Department of Commerce (DOC), the Department of Energy (DOE), the Department of Health and Human Services (HHS), the Department of the Interior (DOI), the Environmental Protection Agency (EPA), the National Aeronautics and Space Administration (NASA), the National Science Foundation (NSF), the Smithsonian Institution (SI), and the Department of Defense (DoD). The DoD research activities are conducted for defense-related missions, they are not included in this USGCRP budget crosscut. Related DoD research does contribute to achieving USGCRP goals, however. The DOC activities are centered in the National Oceanic and Atmospheric Administration (NOAA) and HHS activities are centered in the National Institutes of Health (NIH).

The **USGCRP was funded** for U.S. **Fiscal Year 1999** at a level of **$1,656M**; for Fiscal Year **2000** at a level of **$1,687M**; and for Fiscal Year **2001** at a level of **$1,713M.** The **2002 Fiscal Year Request** is **$1,637M**. This funding includes support for overhead costs. The funding can be broken out as follows (in millions (M) of dollars):

	FY 1999	FY 2000	FY 2001	FY 2002
Scientific Research:				**Request**
USDA	52	56	56	56
DOC/NOAA	63	67	80	93
DOE	114	113	119	121
HHS/NIH	40	48	52	57
DOI/USGS	27	27	27	22
EPA	16	21	23	22
NASA	218	232	254	253
NSF	182	187	187	187
SI	*7*	*7*	*7*	*7*
Subtotal:	**719**	**758**	**805**	**818**
Observations and Data Systems:				
NASA	**937**	**929**	**908**	**819**

Over the three-year period from FY1999 through FY2001, funding for the USGCRP rose slightly and funding for FY2002 is likely to remain at a similar level.

USGCRP-sponsored scientific research for FY2001 and FY2002 focus on the following; with funding requested in each area for FY 2002 in parentheses.

Climate Variability and Change – research and observations related to understanding climate variability and change ($486M)

Atmospheric Composition – research and observations related to improving understanding of ongoing changes in atmospheric composition ($310M)

Global Carbon Cycle – research and observations related to understanding the global carbon cycle ($221M)

Global Water Cycle – research and observations related to understanding the global water cycle ($309M)

Changes in Ecosystems – research and observations related to understanding changes in managed and unmanaged ecosystems ($199M)

Human Dimensions of Global Change – study of the human dimensions of global change ($107M)

Today the USGCRP combines and coordinates the research of the federal departments and agencies having active global change research programs and provides liaison with the Executive Office of the President. Since its inception, the USGCRP has strengthened research on key scientific issues and fostered much-improved insight into the processes and interactions of the Earth system.

The USGCRP sets priorities and carries out its activities in close association with, and in support of, coordinated science priorities of the national and international re-

search community, particularly those advanced by the World Climate Research Program (WCRP), the International Geosphere-Biosphere Program (IGBP), and the International Human Dimensions Program (IHDP).

National mechanisms for supporting integration and coordination of international cooperation in global change research:

The USGCRP contributes to and benefits from international research efforts to improve understanding of global change on both the regional and global scales.

A variety of mechanisms/processes are available to scientists and scientific programs to seek funding for integration and coordination activities through the USGCRP. Those seeking such funding can approach an individual agency directly; they can approach a group of agencies directly; or they can use either of these roads indirectly (e.g., an international research program can work through a "U.S. National Committee") for that program. U.S. scientists and scientific institutions are generally well aware of the various options available to them.

Most requests to U.S. agencies for integration and coordination activities of the organized international programs are handled by these agencies as a group, that is, through the interagency committee that coordinates the USGCRP. Most of these requests are processed through one agency – the National Science Foundation acting in this area on behalf of the USGCRP – although other agencies provide substantial funds for specific programs of special interest to them.

Recent news and developments:

On June 11, 2001, President George W. Bush announced establishment of the U.S. Climate Change Research Initiative to study areas of uncertainty and identify priority areas for investment in climate change science. Development of planning for this new initiative is underway and is expected to lead to changes in USGCRP climate research activities in FY 2003 and beyond.

IGFA MEMBER SURVEY

INTRODUCTION

For the year 2001, IGFA broadened the scope of the National Updates in the context of the ongoing reflections about what IGFA is and what it wants.

IGFA has been and is an informal group of funding agencies discussing the funding and coordinating aspects of Global Change Research. It is founded on the common conviction that this kind of research needs internationally coordinated support. The agreement on the "Statement on the Mode of Operation" during the last plenary in Zürich lead to a clearer notion of procedural concepts in this respect. Also in the context of the effort to win new members, there has been a re-thinking of whatever information there is on 'What is IGFA?', trying to come up with a concise picture of who IGFA is, what it does and what it wants to do in the future.

Gathering information from the community and engaging in the presented 'census' – collecting facts on member agencies regarding their structure, engagement and relevance for Global Change Research – helped to get a clearer picture of the *status quo* of IGFA.

The following questions had been asked (short versions are given again with the individual answers):

1. What funding agency do you represent?
2. What is your function in the structure of this agency and/or in the structure of the science community of your home country, which relates to Global Change research and especially to the International Global Change Research Programs (WCRP, IGBP, IHDP, DIVERSITAS)?
3. What is the scope of this funding agency in relation to Global Change Research in the widest sense of sustainability science? Does it for example comprise CGIAR for agriculture or IIASA or the Regional Networks for capacity building?
4. Is the agency (already) involved in the "core funding" of the four International Research Programs on Global Change? "Core funding" means mainly financing the International Secretariats, IPOs, synthesis or integrating efforts etc.
5. Has this agency a lead or coordinating role for funding Global Change Research in your country?
6. Are there any special coordinating mechanisms related to Global Change Research in your system where governmental and scientific organization work together in international science policy, e.g. through a chief scientist position in government, and interagency committee or an advisory panel of scientists in a coordinating function related to funding decisions?
7. Are there other funding agencies engaged in this field in your country (also privately funded ones)? If known, please state the relative proportions of these agencies in funding of Global Change Research in your country.
8. Which funding agency or what science community is representing your country in international (scientific) organizations which are important for Global Change Research like ICSU, UNESCO, UNEP or GEF?

AUSTRIA

1. *What funding agency do you represent?*

   Federal Ministry of Education, Science and Culture

2. *What is your function in the structure of this agency?*

   Dr. Christian Smoliner

   Function: Head of Unit, Department of Environmental Research

   Responsibility:

   - Funding and coordination of inter- and transdisciplinary environmental research programs. Actual program: Austrian Landscape Research (www.klf.at)
   - Funding of commissioned environmental research.
   - Member of several committees related to GC relevant research, e.g. the GC research programs of the Austrian Academy of Sciences (AAS), or the Man and Biosphere program (also AAS)

   Andreas Geisler

   Function: Scientific Officer, Department of Environmental Research

   Responsibility:

   - Internationalization of the Austrian environmental research
   - Coordination of the Austrian Network of Environmental Research
   - Delegate to the FP5 program committee "Environment and sustainable development"

3. *What is the scope of this funding agency in relation to Global Change Research?*

   To plan, implement, coordinate and advance inter- and transdisciplinary sustainability research in Austria. Close relationship to IIASA funding department in the Ministry.

4. *Is the agency involved in the 'core funding' of the 4 international GCR Programs?*

   Yes, by two ways:

   Indirectly, via the funding of the GC programs of the Austrian Academy of Science which contribute to the IGBP and WCRP via membership fee.

   Directly, by funding the IHDP and DIVERSITAS Secretariats via the net-nodes "Socioeconomic Environmental Research" and "Biodiversity Research" of the Austrian Network of Environmental Research.

5. *Has this agency a lead or coordinating role for funding GCR in your country?*

   Yes, by means of following instruments:

   - Planning, implementation, advancement and coordination of inter- and transdisciplinary research programs on sustainability and environment (current program: Austrian Landscape Research)
   - Funding of GC synthesis projects
   - Core funding of GC related programs of the Austrian Academy of Science

- Funding of coordination mechanisms for GC research (Austrian Network of Environmental Research)
- Funding of GC relevant congresses
- Funding of travel costs of GC scientists

6. *Are there any special coordinating mechanisms related to GCR in your system?*

   Yes, for example, we established the above mentioned Austrian Network of Environmental Research (http://nuf.boku.ac.at). Main objective of the Austrian Network for Environmental Research is the promotion of international research activities and the support of environmental scientists. The network functions as an interdisciplinary think-tank for developing future-oriented concepts and international research co-operations and fulfills a vital role in the close co-operation of research politics, scientific program conception and organization that is necessary for developing a successful international research agenda. It functions as a consultant for the Austrian Ministry of Education, Science and Culture concerning specific concepts, strategies and international lobbying activities.

   Focus groups are scientists, science related persons and institutions and organizations involved in research coordination and funding at national and international level.

7. *Are there other funding agencies engaged in this field in your country?*

   Please see our last national update.

8. *Representation in international (scientific) organizations important to GCR:*

   The Austrian Academy of Science (www.oeaw.ac.at).

NSFC (CHINA)

1. *What funding agency do you represent?*

   National Natural Science Foundation of China (NSFC)

2. *What is your function in the structure of this agency?*

   The National Natural Science Foundation is one of the main national funding agencies for fundamental researches in China. Global change researches have been approved as one of the proprietary domains of the NSFC over the several previous national five-year programs. A major part of the research projects relative to global change sciences are managed by the Department of Earth Sciences (mostly projects relative to WCRP, IGBP, IHDP) and another part (mostly relative to DIVERSITAS) is supported by the Department of Life Sciences. Researches are supported through three levels: major projects, important projects and ordinary projects.

3. *What is the scope of this funding agency in relation to Global Change Research?*

   The funding scope of the National Natural Science Foundation covers all the disciplines related to global change sciences. The purposes are to promote the developments of these scientific disciplines, to address those issues that are helpful to avoid the degradation of environments during the economic development, and to promote capacity buildings. Agricultural science is among the most important domains of the NSFC. However, NSFC supports fundamental researches on these themes, rather than application sciences.

4. *Is the agency involved in the 'core funding' of the 4 international GCR Programs?*

   NSFC has not yet directly involved in funding the four International Research Programs, but this could be one of the considerations in the future.

5. *Has this agency a lead or coordinating role for funding GCR in your country?*

   NSFC plays, to a large extent, lead roles for funding Global Change Research in China. Although some other funding agencies also fund global change researches, they are in close coordination with the NSFC.

6. *Are there any special coordinating mechanisms related to GCR in your system?*

   Scientific policy of the NSFC is very dependent of the various advisory panels of scientists. These advisory panels are in close collaboration with the NSFC leaders or department leaders. All the project proposals have to experienced several scientific evaluations. Moreover, funding decisions are usually made through coordination with the other main funding agencies to avoid overlaps.

7. *Are there other funding agencies engaged in this field in your country?*

   Chinese Academy of Science (CAS), Ministry of Science and Technology, PCR. The programs funded by these funding agencies include GCTE, GLOBEC, WCRP, PAGES, DIVERSITAS, LOICZ, LUCC and so on.

8. *Representation in international (scientific) organizations important to GCR:*

   The national committee of IGBP in China is representing China in international scientific organization. The committee consists of a great proportion of the leaders from the main national funding agencies and includes also a great number of scientists in the fields of global change.

BMBF (GERMANY)

1. *What funding agency do you represent?*

   Federal Ministry of Education and Research (BMBF)

2. *What is your function in the structure of this agency?*

   Vice-director general. General responsibility for funding of Environmental and socio-economic research, including Global-Change-Research.

3. *What is the scope of this funding agency in relation to Global Change Research?*

   Covering the whole range of research in the widest sense:
   Support of national research activities in different areas of Global-Change-Research (e.g. atmospheric and climate research, climate impact research, geosciences, water, marine and polar research, earth system science, biodiversity, ecosystems and agricultural research), often also contributing to international research programs (WCRP, IGBP, IHDP, DIVERSITAS). Main funder of integrated research strategies (inter- and transdisciplinary research integrating natural and socio-economic research including technology and science and technology co-operation with other countries). Contribution to IIASA and START.

4. *Is the agency involved in the 'core funding' of the 4 international GCR Programs?*

   - Main funder of IHDP – International Secretariat.
   - Main funder of BAHC - IPO.
   - Co-funder of IGBP, DIVERSITAS and START.

5. *Has this agency a lead or coordinating role for funding GCR in your country?*

   No formal co-ordinating role, but main contributor.

6. *Are there any special coordinating mechanisms related to GCR in your system?*

   - German Advisory Council on Global Change (WBGU) of Federal Government (advising on policies and science-policy relation)
   - National Committee for Global-Change-Research of Deutsche Forschungsgemeinschaft (DFG) (Advisory Committee)

7. *Are there other funding agencies engaged in this field in your country?*

   - Deutsche Forschungsgemeinschaft (DFG)
   - German Weather Service (supporting WCRP via its contribution to WMO)
   - Federal Ministry for Environment (imminent convention-related research)
   - The bulk of funding comes from BMBF.

8. *Representation in international (scientific) organizations important to GCR:*

   - DFG is member of ICSU.
   - Representatives in UNDP, UNEP, World Bank (GEF) are from the Ministries of Foreign Affairs, Environment and International Cooperation etc.

   Within OECD and UNESCO. It depends on the subject; for research and science-related activities the Head of Delegation normally comes from BMBF.

DFG (GERMANY)

1. *What funding agency do you represent?*

   Deutsche Forschungsgemeinschaft (DFG)

2. *What is your function in the structure of this agency?*

   Programme Director for Earth Sciences and Coordinator for Environmental Research, as such responsible for the German National Committee for Global Change Research

3. *What is the scope of this funding agency in relation to Global Change Research?*

   The DFG is responsible for funding in all disciplines, therefore it is related to all aspects of Global Change Research. Funding is person-oriented, project- and programme-wise, but not institutional. Therefore, partial institutional funding of IIASA is for example not possible.

4. *Is the agency involved in the 'core funding' of the 4 international GCR Programs?*

   The DFG is involved in the core funding of the WCRP and IGBP International Secretariats and „core budgets" on this level. It has indicated willingness to contribute to the core funding of IHDP and DIVERSITAS. DFG cannot fund IPOs. In addition, in the past DFG has contributed to some special activities, e.g. the evaluation of the IGBP.

5. *Has this agency a lead or coordinating role for funding GCR in your country?*

   Besides the BMBF, yes: host of the National Committee for Global Change Research.

6. *Are there any special coordinating mechanisms related to GCR in your system?*

   National Committee for Global Change Research: coordinating and advisory functions.

7. *Are there other funding agencies engaged in this field in your country?*

   BMBF, DFG, Ministries of the Länder, Volkswagen-Foundation, Deutsche Bundesstiftung Umwelt.

8. *Representation in international (scientific) organizations important to GCR:*

   DFG is the national representative of ICSU.

EUROPEAN COMMISSION

1. *What funding agency do you represent?*

   The European Commission

2. *What is your function in the structure of this agency?*

   Director of the European Union's RTD sub-programme on "Environment and Sustainable Development". Funding of transnational European research projects in the fields of global change, climate, sustainability, environmental impacts, eco-system functioning, water management and biodiversity.

3. *What is the scope of this funding agency in relation to Global Change Research?*

   Funding only for RTD projects and supporting initiatives, including support to research infrastructures and socio-economic aspects of environmental change in the perspective of sustainable development. No basic institutional funding.

4. *Is the agency involved in the 'core funding' of the 4 international GCR Programs?*

   No.

5. *Has this agency a lead or coordinating role for funding GCR in your country?*

   The European Commission has a lead role in funding and co-ordinating transnational collaborative Global Change research projects in Europe.

6. *Are there any special coordinating mechanisms related to GCR in your system?*

   Co-ordination in respect to environment policy and to funding decisions takes place with the respective departments of the European Commission, notably DG Environment, within the established committees.

7. *Are there other funding agencies engaged in this field in your country?*

   Funding agencies and foundations in the EU member countries.

8. *Representation in international (scientific) organizations important to GCR:*

   The European Commission is self-representing.

IRC (ICELAND)

1. *What funding agency do you represent?*

   The Icelandic Research Council

2. *What is your function in the structure of this agency?*

   The Icelandic Research Council endeavors to establish contacts with corresponding councils and foundations in other countries. The small number of staff and resources, however, limits participation to the essential, practical aspects of international co-operation in fields where Icelandic scientists have shown their strength, or when nationally relevant research is at stakes. Increasing interest is being shown in international and bilateral frameworks, particularly for the study of environmental and global change processes (IASC, ODP, IGFA, IGBP, and IPGC).

3. *What is the scope of this funding agency in relation to Global Change Research?*

   The Icelandic Research Council administrates participation in international programs, but the true participation is usually on individual scientists/institutions bases. The Council finances many research projects carried out in Iceland and are linked to these international programs.

4. *Is the agency involved in the 'core funding' of the 4 international GCR Programs?*

   The Icelandic Research Council is involved in "core funding" of IGBP but not WCRP, IHDP and DIVERSITAS. The Council is also a member of other international research programs/agencies, which involve global change research (IASC, ODP).

5. *Has this agency a lead or coordinating role for funding GCR in your country?*

   In 1999 IRC received earmarked national funds to finance increased research efforts into the area of environmental research. The Government of Iceland has provided a total of 95 MIKR (about 1 M$) for a five year period (1999-2004) to fund research into information technology (60%) and environmental research (40%). Important parts of these funds are directed at research themes relevant to global change research. The grants already awarded in the area of information technology includes development of comprehensive natural database (GIS) on natural resources and natural phenomena essential to follow long-term changes. Projects in paleo-climatic research are also funded under the environmental part.

   The IRC has recently delivered recommendations to the Government of Iceland regarding ways to increase cooperation and synergies between Icelandic research units. Some of the areas being discussed for such networks would be centered around research themes related to global change and natural variability or its effects on the life and economy of Iceland, such as physical and biological processes of the ocean environment and its interaction with the atmosphere, impact on desertification and ecological changes. The existence of long time-series of observations and monitoring form a basis for future research and modeling efforts.

6. *Are there any special coordinating mechanisms related to GCR in your system?*

   The Arctic Council in cooperation with the IASC, AMAP, CAFF and IPCC are undertaking a scientific assessment of consequences of climate variability and change in the Arctic region (Arctic Climate Impact Assessment - ACIA). This ma-

jor effort is designed to meet the urgent need for regional assessments. The Icelandic Research Council plays an important role in preparing a National Implementation Plan (NIP) for ACIA. This plan will specify priority topics from Iceland's perspective, suggest data sources and experts, and identify resources needed to synthesize this information for ACIA. The government (mainly Ministry of Environment and the Foreign Ministry) will finance the NIP in co-operation with the Icelandic Research Council.

7. *Are there other funding agencies engaged in this field in your country?*

   No, there are no other funding agencies engaged in this field in Iceland.

8. *Representation in international (scientific) organizations important to GCR:*

   The Icelandic Research Council is a member of ICSU. Participation in UNESCO, UNEP or GEF, if any, is on political bases and the Council does not have any role.

MEXT (JAPAN)

1. *What funding agency do you represent?*

   Ministry of Education, Culture, Sports, Science and Technology (MEXT), Japan. The Science and Technology Agency and Ministry of Education, Science, Sports and Culture (Monbusho) were integrated into the MEXT in January 2001.

2. *What is your function in the structure of this agency?*

   I am in charge of promoting international cooperative researches in the field of Ocean and Earth sciences in close cooperation with universities in Japan, Research Institute for Humanity and Nature (RIHN), National Institute of Polar Research (NIPR), Japan Marine Science and Technology Center (JAMSTEC) and National Space Development Agency of Japan (NASDA). With regard to the IGBP, I am also in charge of providing a part of its core fund.

3. *What is the scope of this funding agency in relation to Global Change Research?*

   The Ministry of Education, Culture, Sports, Science and Technology is:

   - Implementing global change researches in national universities, RIHN and NIPR;
   - Financing and supervising all activities of the JAMSTEC including Frontier Research System for Global Change (FRSGC), Frontier Observational Research System for Global Change (FORSGC) and the Earth Simulator, and all activities of the NASDA, which operates the FRSGC collaborated with the JAMSTEC; and
   - Funding to researchers in all scientific and technological areas, including global change researches, in order to promote science and technology in Japan.

4. *Is the agency involved in the 'core funding' of the 4 international GCR Programs?*

   MEXT provides a part of IGBP's core fund. JAMSTEC also provides a part of WCRP sub-programs' core fund.

5. *Has this agency a lead or coordinating role for funding GCR in your country?*

   Yes (especially in a sense of financing all activities in the FRSGC through JAMSTEC and NASDA).

MOE (JAPAN)

1. *What funding agency do you represent?*

   Ministry of the Environment (MOE), Japan

2. *What is your function in the structure of this agency?*

   The function of the Information and Research Office, Global Environment Bureau, MOE includes:

   - Planning and implementation of basic policy for survey and research on global environmental protection;
   - Coordination among relevant ministries and agencies for survey and research on global environmental protection;

   Allocation of research fund for global environmental protection to relevant agencies and ministries, and their research institutes.

3. *What is the scope of this funding agency in relation to Global Change Research?*

   The scope includes:

   - Funding to national research institutes, universities, and other research organizations to encourage, in particular, cross-cutting and multi-agency research activities on global environmental protection, and also to encourage participation in international research programs such as IGBP, WCRP and IHDP;
   - Allocation of research fund for global environmental protection to relevant agencies and ministries;
   - Provision of fellowship to young researchers;
   - Funding to the Asia-Pacific Network for Global Change Research, which is an intergovernmental global change research network in the region encouraging international joint research and capacity building;

   Implementation of research, e.g. aiming at building scientific infrastructure for the achievement of sustainable development in the Asia-Pacific region.

4. *Is the agency involved in the 'core funding' of the 4 international GCR Programs?*

   We have not provided such core funding explicitly. Such spending might be included in supporting funds for individual research programs.

5. *Has this agency a lead or coordinating role for funding GCR in your country?*

   Yes. We have a lead and coordinating roles for funding GCR especially in the research fields closely related to global environmental policy.

6. *Are there any special coordinating mechanisms related to GCR in your system?*

   An advisory panel of scientists has been established to establish priority research areas and topics, support funding decisions of the agency and follow up the outcomes of the funded programs.

7. *Are there other funding agencies engaged in this field in your country?*

   Other major governmental funding agencies engaged in this field include:

   - Ministry of Education, Culture, Sports, Science and Technology
   - Ministry of Economy, Trade and Industry

NWO (THE NETHERLANDS)

1. *What funding agency do you represent?*

   The Netherlands Organization for Scientific Research NWO

2. *What is your function in the structure of this agency?*

   NWO Research Council for Earth and Life Sciences:
   a) Dr. J Marks: Director Earth and Life Sciences
   b) Dr. H. de Boois: Coordinator for Earth Sciences and Global Change Research

3. *What is the scope of this funding agency in relation to Global Change Research?*

   NWO funds GCR in its widest sense. NWO is the Netherlands' member of IIASA.

4. *Is the agency involved in the 'core funding' of the 4 international GCR Programs?*

   NWO co-ordinates and contributes to the Dutch funding for the IPO LOICZ, for the IHDP-office and for the DIVERSITAS office. Dutch funding of the secretariat of IGBP is taken care of by the Royal Academy KNAW. Additionally, funds are available for fostering international coordination (glue money). Only the directors of the international programs can apply for these funds. NWO coordinated Dutch funding for the OSC of IGBP.

5. *Has this agency a lead or coordinating role for funding GCR in your country?*

   NWO has a prominent role in the (now terminating) National Research Program on global air pollution and climate change (NRP) and in the preparation of follow-up of this program. Additionally, NWO funds own programs dedicated to GCR.

6. *Are there any special coordinating mechanisms related to GCR in your system?*

   There is no such formalized construction specifically for GCR. There are advisory councils (outside NWO) for Nature and Environmental Research, for Science and Technology which primarily report to ministries. Occasionally, the Royal Academy of Arts and Sciences, which hosts the national committees for IGBP, WCRP and IHDP, advises ministries on GCR.

7. *Are there other funding agencies engaged in this field in your country?*

   About half of the GCR is funded by institute/university budgets (in 1999: Euro 11 M). The other half (in 1999: Euro 11 M) goes via programmatic funding by:

   - NWO (40%)
   - the Ministry of Education and Science (10%)
   - the Ministry of the Environment (25 %)
   - the Ministry of Transport and Public Works (minor)
   - the Ministry of Agriculture, Nature and Fisheries (minor)
   - the Ministry of Economical Affairs (in particular on energy, 25%)

   Part of these funds go through NWO or an other intermediary organization (NOVEM).

8. *Representation in international (scientific) organizations important to GCR:*

   ICSU: Royal Academy of Arts and Sciences
   UNESCO: ministry of Education, Culture and Science
   UNEP: ministries of the Environment and of Foreign Affairs
   GEF: ministry of Foreign Affairs

RCN (NORWAY)

1. *What funding agency do you represent?*

   Research Council of Norway (RCN)

2. *What is your function in the structure of this agency?*

   The Norwegian IGFA representatives Director Kirsten Broch Mathisen and Adviser Terje Mørland represents the Environment and Development Division (ED), which is one of six thematic divisions of RCN. The administration of ED is organized into two departments: *Department on Environmental Research* and *Department of Development Research*. Kirsten Broch Mathisen is head of the *Department on Environmental Research.* ED is responsible for administration of most of GCR at RCN, including the Norwegian Global Change Committee and thus relations with the international GC Programs. Special adviser Nina Gornitzka and Terje Mørland are responsible for the Global Change Committee.

3. *What is the scope of this funding agency in relation to Global Change Research?*

   RCN covers all kinds of research in Norway, including ALL aspects of GCR.

4. *Is the agency involved in the 'core funding' of the 4 international GCR Programs?*

   Yes.

5. *Has this agency a lead or coordinating role for funding GCR in your country?*

   Yes, RCN has both a lead and coordinating role, cf. 2 and 3. We estimate that our fraction of the total funding for GCR in Norway is a little less than 40%.

6. *Are there any special coordinating mechanisms related to GCR in your system?*

   No special mechanisms as mentioned above. However, the Ministry of the Environment is the main funder of environmental research in Norway and there is generally good and direct communication between this Ministry and the ED division of RCN.

7. *Are there other funding agencies engaged in this field in your country?*

   Universities get their basic funding directly from the various ministries. The basic funding for the institute sector is normally channeled through the RCN. Some ministries also provide project funding to a limited degree. The RCN is the only real funding agency when it comes to project funding. There are no major private funding agencies of big importance for GCR. We estimate that RCN's fraction of the total funding for GCR in Norway is a little less than 40%.

8. *Representation in international (scientific) organizations important to GCR:*

   The Royal Norwegian Academy of Science generally represents Norway in ICSU and other science community organizations. All intergovernmental organizations: Various ministries represent Norway. UNEP = Ministry of the Environment, UNESCO = Ministry of Foreign Affairs etc. The RCN has an adviser function to these organizations.

NRF (SOUTH AFRICA)

1. *What funding agency do you represent?*

   National Research Foundation (NRF), South Africa

2. *What is your function in the structure of this agency?*

   Research manager investing in a broad multi-disciplinary Focus Area called Conservation & Management of Ecosystems & Biodiversity. The function is primarily aimed at making research grants to the higher education sector as well as to support research platforms and research networks within the scope of the Focus Area. The South African government is the primary funder of this national program. NRF has a demonstrated capability to also manage donor funding. NRF is the national body to which all ICSU committees report and adhere to. NRF pays the ICSU dues on behalf of the South African research community.

3. *What is the scope of this funding agency in relation to Global Change Research?*

   The NRF supports all disciplines and domains of science. Two other of NRF's Focus Areas are called Sustainable Livelihoods and Economic Growth. These will support research in relation to CGIAR activities. The concept of sustainable development permeates all NRF activities. Capacity building is a core activity of the NRF and specialized programs are focussed on this and would include GCR.

4. *Is the agency involved in the 'core funding' of the 4 international GCR Programs?*

   Not directly but maybe indirectly through membership fees and support for South African delegates to participate in committee meetings.

5. *Has this agency a lead or coordinating role for funding GCR in your country?*

   The NRF controls the South African Global Change Committee. This committee does not have a budget but acts as the voice of the GCR community and would coordinate activities from time to time. NRF does not have a GCR focussed program but would fund many local GCR projects under some of its more broadly defined Focus Areas. Most of these are supported under the Focus Area that I manage. The projects funded by NRF are seldom of international scope and usually more directed at local issues. NRF may from time to time become a co-sponsor of projects in the southern African region, e.g. SAFARI 2000 and some projects are aligned to IGBP programs, either purposefully or by default.

6. *Are there any special coordinating mechanisms related to GCR in your system?*

   Coordination of funding decisions takes place at many levels and through many organizations, e.g. the South African Global Change Committee, the National Climate Change Committee, and various research program evaluation panels and advisory committees established by individual funding agencies. Certainly it should be acknowledged that coordination and promotion of GCR at the national level is fragmented and mission driven by individual funding agencies.

7. *Are there other funding agencies engaged in this field in your country?*

   NRF is probably the only true funding agency at the national level. Other organizations mostly support in-house research. Two other funding agencies, the Water Research Commission and the Marine Living Resources Fund are directing most of their funding obtained from industrial levies to serve the immediate needs of those industries. The national Department of Environmental Affairs & Tourism do

have considerable access to international donor funding and manage to spend some of that also in relation to GCR. The Agricultural Research Council and the national Department of Water Affairs & Forestry have environmental monitoring programs. The Council for Scientific and Industrial Research often take the lead in local chapters of international GCR programs, like SAFARI 2000 and GTOS.

8. *Representation in international (scientific) organizations important to GCR:*

   The NRF is the responsible funding agency for ICSU and UNESCO, both on behalf of the national Department for Arts, Culture, Science & Technology. The national Department of Environmental Affairs & Tourism is responsible for representation in GEF and UNEP and other organizations with an environmental focus.

MCYT (SPAIN)

1. *What funding agency do you represent?*

   Ministry of Science and Technology (MCYT). National Plan for Scientific Research, Development and Innovation.

2. *What is your function in the structure of this agency?*

   I am the scientific manager of the "Global Change and Biodiversity" Subprogram.

3. *What is the scope of this funding agency in relation to Global Change Research?*

   The Spanish Ministry of Science and Technology is funding any kind of research, applied, oriented and basic non-oriented research, at national level. This is not the only one in Spain, but some others regional and sub-regional agencies are operating also in our country. This is not an agency funding or supporting capacity building abroad. Within its priorities are included those related to Global Change research at different levels including not only ecosystems but agriculture, climate and atmosphere, marine science, water resources and natural risks.

4. *Is the agency involved in the 'core funding' of the 4 international GCR Programs?*

   The MCYT is by now only contributing to the IHDP Secretariat. Now, the MCYT, is organizing and funding a new phase of Spanish IBGP Committee and we have already organize a new Spanish Committee for SCOPE. Also a new committee for climate change has been created with the goal of giving answers to the questions raised from the IPCC.

5. *Has this agency a lead or coordinating role for funding GCR in your country?*

   Not that specific, but yes, for coordinating and fund not only Global Change Research, but all research at state level.

6. *Are there any special coordinating mechanisms related to GCR in your system?*

   Although both, scientific and governmental advisory bodies do exist in Spain, the co-ordination is not very close between them. Nevertheless, for taking decisions in funding research only one staff from the environmental managing body is present in the committee that decides funding for research projects. In the contrary it is very common that scientist participate in the advisory committees for Global Change or Biodiversity issues like IPCC, CBD or CCD.

7. *Are there other funding agencies engaged in this field in your country?*

   Supposedly, the Autonomous Governments have similar funding bodies. Private agencies in this field not known.

8. *Representation in international (scientific) organizations important to GCR:*

   MCYT is representing all of them through its deputy-direction general for Foreign Organisms and Programs. The contact person is Dr. Francisco Ferrandiz, Calle Jose Abascal, 4 28003 Madrid (Spain).

SNF (SWITZERLAND)

1. *What funding agency do you represent?*

   Swiss National Science Foundation (SNF)

2. *What is your function in the structure of this agency?*

   Scientific collaborator in the international division, responsible for GCR issues and scientific partnership with developing countries.

3. *What is the scope of this funding agency in relation to Global Change Research?*

4. *Is the agency involved in the 'core funding' of the 4 international GCR Programs?*

   - PAGES: 50% (other 50% by the US-NSF)
   - DIVERSITAS: 20'000 US $ per year (2000-2003 included)
   - MRI (Mountain Research initiative): 2001-2002 (in collaboration with other Swiss institutions.

5. *Has this agency a lead or coordinating role for funding GCR in your country?*

   In collaboration with other agencies (ProClim, Federal office for environment, forest and landscape), yes. The SNF is financing for 10 years the new National Centre of competences in Research, NCCR-Climate which has his leading house in Bern. SNF is also financing for 10 years the new NCCR-North-South: Research partnership for mitigating syndromes of global change.

6. *Are there any special coordinating mechanisms related to GCR in your system?*

   ProClim is a forum for climate change issues initiated in 1988, and was the first organization which has assigned research projects in Switzerland to international GC programs. As an independent organization of the Swiss Academy of Sciences, ProClim actively promotes interdisciplinary scientific collaboration and interconnection between scientists and public policy makers, assists with the development of coordinated research projects, and facilitates the exchange of information on global change science within Switzerland.

   OcCC (Advisory Body to the Federal Department of the Interior on Climate Change Research and Policy) founded by the Swiss Academy of Natural Sciences in 1997. The duties of OcCC include, among other activities, recommendations concerning research priorities, coordination of research activities, and suggestions for the protection of climate. The committee includes representatives from climate research and industry, as well as members of the government and the SNF.

   NCCR-Climate: the first selection of the NCCR was made by the SNF on the base of scientific quality of the projects. A final selection was made by the government and scientists in regard of priorities in research policy.

   NCCR-Noth/South: Research partnership for mitigating syndromes of global change (same as above).

7. *Are there other funding agencies engaged in this field in your country?*

   The major source of financing is the SNF, which supports the NCCR-Climate, research programs and research projects in the larger field of GCR. The Swiss Academy of Natural Sciences founds also different international and national integration and co-ordination activities (see report IGFA meeting Zurich 2000, Na-

tional Updates, p. 49). The Swiss Academy of Humanities and Social Sciences supports IHDP-IPO located in Bonn (5000 US $) and the national IHDP committee wit approx. 2000 US $ p.a.. Some Federal Offices also carry out public sector research. The private industry also finance environmental research but the amount provided by the public sector far exceeds the amount supplied by the private sector.

8. *Representation in international (scientific) organizations important to GCR:*

   Scientific research institutions, SNF, ProClim and other public institutions.

NSC (TAIWAN)

1. *What funding agency do you represent?*

   Commission on Sustainable Development Research (CSDR), National Science Council of Taiwan (NSC).

2. *What is your function in the structure of this agency?*

   Within NSC, CSDR is the main body to coordinate and fund the Global Change Research (GCR) projects closely related to international programs such as IGBP, WCRP and IHDP. In addition, Life Science Department (LSD) and Natural Science and Mathematical Department (NSMD) also fund GCR related projects, which are more fundamental. CSDR also provides adequate fund for the IGBP National Committee (China-Taipei) to promote and sponsor the international activities and collaborations.

3. *What is the scope of this funding agency in relation to Global Change Research?*

   The basic philosophy of GCR programs funded by CSDR is to "think globally, act locally" and is aimed to understand changes occurring in Taiwan and its surrounding areas, which are within the scope of IGBP, IHDP and WCRP.

4. *Is the agency involved in the 'core funding' of the 4 international GCR Programs?*

   Yes. Recently, the SARCS (Southeast Asia Regional Committee for START) Secretariat has been moved from Bangkok to Taipei. The CSDR provides all the fund for the Secretariat's operational cost, and will continue to do so in the next few years. An integrated study of "Sustainable Development Indicators for Southeast Asia Region" is under plan. The CSDR will also take the lead role through the set up of the regional research team in studying the sustainable development indicators issue.

5. *Has this agency a lead or coordinating role for funding GCR in your country?*

   Yes, the CSDR is the main funding agency in this country to fund the global change research related project.

6. *Are there any special coordinating mechanisms related to GCR in your system?*

   Yes. The IGBP National Committee sets up the guidelines of National GCR programs, and also routinely reviews the GCR activities. The Committee is primarily comprised of the scientists from Academia Sinica and universities. For funding decision of GCR projects in CSDR, an advisory panel of scientists is formed to conduct and supervise the review process.

7. *Are there other funding agencies engaged in this field in your country?*

   Yes. In addition to CSDR, NSC, other funding agencies which support GCR related projects are listed below. However, those agencies' budget may not be easily clarified for GCR as a whole:
   - Environmental Protection Administration
   - Council of Agriculture
   - Central Weather Bureau
   - Bureau of Industry
   - Energy Commission of the Ministry of Economic Affairs

8. *Representation in international (scientific) organizations important to GCR:*

   Academia Sinica represents China-Taipei for ICSU, IUGG, and IGBP. Unfortunately, since this country is not a member of UN, we are not able to attend the UNESCO, UNEP, and GEF related meetings. We do hope this country can be regarded as an OBSERVER for those intergovernmental committee.

NERC (UNITED KINGDOM)

1. *What funding agency do you represent?*

   Natural Environment Research Council

2. *What is your function in the structure of this agency?*

   The seven UK Research Councils are established under Royal Charter to support high quality research, both for its intrinsic scientific value and its role in national wealth creation and quality of life.

   a) Professor John Lawton, NERC Chief Executive:
   The Chief Executive is the most senior permanent official of NERC and bears responsibility for implementing Council's policies. The Chief Executive has overall responsibility for the day to day running of NERC's business. In connection with Global Change Research (GCR), in addition to membership of the IGFA staff group the Chief Executive is a member of the UK Government's Global Environmental Change Committee.

   b) Dr Chris Baker, NERC Collaborative Programmes Officer:
   The Collaborative Programmes Officer is the NERC contact point for GCR matters and for Councils' programmes and initiatives involving cross-Councils working. He represents NERC on the UK IGBP National Committee, and the Royal Society's Global Environmental Research Committee. In addition he is Superintending Officer for the Councils' Tyndall Centre for Climate Change Research (see 5).

3. *What is the scope of this funding agency in relation to Global Change Research?*

   NERC's mission is to deliver Earth System Science. It does so by:

   1. the promotion and support of high quality basic, strategic and applied research, survey, long-term environmental monitoring and related postgraduate training in terrestrial, marine and freshwater biology and Earth, atmospheric, hydrological, oceanographic and polar sciences and Earth observation;
   2. advancing knowledge and technology, and providing services and trained scientists and engineers, which meet the needs of users and beneficiaries (including the agricultural, construction, fishing, forestry, hydrocarbons, minerals, process, remote sensing, water and other industries);
   3. providing advice on, disseminating knowledge and promoting public understanding of, the fields aforesaid.

   NERC's own research encompasses a very wide geographical range: as well as its own UK research centres, there are also research sites in the Arctic and Antarctic, and research ships which may operate worldwide. It may also support GCR, both UK-based and overseas, by means of awards for studentships and fellowships and for research grants to investigators in universities.

4. *Is the agency involved in the 'core funding' of the 4 international GCR Programs?*

   Yes. NERC contributes to the following IPOs:

   - CLIVAR (WCRP)
   - GCTE (IGBP)
   - GLOBEC (IGBP)

- WOCE (WCRP)

5. *Has this agency a lead or coordinating role for funding GCR in your country?*

   NERC has both a lead and a co-ordinating role. As described above, it is a leading funding agency for GCR, but also plays a key part in co-ordinating the work of other UK Research Councils in or related to this area. A good example of the latter is the *Tyndall Centre* http://www.tyndall.ac.uk/ at the University of East Anglia, (funded by NERC, the Engineering and Physical Sciences Research Council, the Economic and Socal Research Council, and the Department of Trade and Industry), which NERC led the establishment of and oversees.

6. *Are there any special coordinating mechanisms related to GCR in your system?*

   Leading NERC scientists are Chairmen and members of a number of key committees and working groups in the following: International Geosphere Biosphere Programme; International Council for Science; World Climate Research Programme; Intergovernmental Oceanographic Commission; World Meteorological Association; the International Committee of the Ocean Drilling Programme; and the UNESCO International Hydrological Programme.

7. *Are there other funding agencies engaged in this field in your country?*

   Other principal funding agencies are the Royal Society and parts of Government such as the Environment Agency and the newly formed Department for Environment, Food and Rural Affairs (DEFRA). The changes in Government's arrangements following the recent general election mean it is not yet possible to give the requested information on relative proportions in funding of GCR in the UK.

8. *Representation in international (scientific) organizations important to GCR:*

   ICSU: Royal Society

   UNESCO and GEF: Department for International Development

   UNEP: Department for Environment, Food and Rural Affairs

CAPACITY BUILDING QUESTIONNAIRE

INTRODUCTION

The topic of capacity building was very prominent in IGFA's plenary meeting 2000 and was seen as one of the priority issues for the future. In preparation for the session on capacity building at the IGFA plenary 2001 in Stockholm, all members were surveyed about capacity building initiatives in the represented countries.

"Capacity building" (CB) in this context is understood as ***all measures to improve the scientific capacity in developing countries to contribute to Global Change Research*.** This includes for example training of young scientists or of experts in a special sector, organization of workshops or seminars, and the transfer or co-production of methodology, measurement techniques, and data analysis procedures. Experimental work / projects in developing countries (DCs) that involve host country scientists also qualify if done with the clear intention of establishing a solid and long-term basis for independent scientific capacity and indigenous institution building.

In addition to a short general description, the following questions were asked (short versions are given again with the individual answers):

1. Is capacity building commonly accepted as something that is needed among the organizations involved in Global Change Research funding in your country?
2. Are there any special funding schemes for capacity building initiatives or are they included as an element of Global Change Research projects you fund?
3. Can scientists from abroad directly apply for and receive funds?
4. Do you concentrate on certain countries and/or regions?
5. Do you interact with regional or international research programs/networks for Global Change such as START, IAI, APN, or ENRICH?
6. Which other agencies in your country deal with capacity building and what procedures do they follow?
7. Are there coordinated efforts with regard to capacity building initiatives
   a) among national organizations?
   b) between national organizations and national or international aid agencies?
8. Are there special criteria for the funding of projects involving scientific partners in developing countries such as
   - making full use of the existing competence in the host country; or
   - full integration of projects within the scientific structure of the host country?
9. Are improvements to existing procedures or the creation of new procedures being initiated in your country with regard to capacity building?
10. Can you name some examples of current projects/initiatives sponsored by your country's funding organizations that have capacity building in the context of Global Change Research as a primary objective?

AUSTRIA

1. *Is CB accepted as necessary by the GCR funding agencies in your country?*

   Yes.

2. *Are there any special funding schemes for CB initiatives?*

   They are to a very limited amount part of selected GCR relevant projects (several projects). Capacity building initiatives in general are one of the pillars of the Austrian Development Cooperation (http://www.bmaa.gv.at/eza/index.html.en) and multilateral university cooperation initiatives (e.g., ASEA-UNINET, http://asea-uninet.uibk.ac.at/). As part of these, also GCR relevant capacity building is supported. Nevertheless, it has to be emphasized, that there is no explicit GCR capacity building initiative in Austria.

3. *Can scientists from abroad directly apply for and receive funds?*

   No.

4. *Do you concentrate on certain countries and/or regions?*

   The Austrian Development Cooperation and the university cooperation initiatives concentrate on certain countries and regions.

5. *Do you interact with regional or international research programs/networks?*

   No.

6. *Which other agencies in your country deal with CB, following which procedures?*

7. *Are there coordinated efforts with regard to capacity building initiatives*

   Yes, but not explicitly for GCR per se (http://www.bmaa.gv.at/eza/index.html.en).

8. *Are there special criteria for funding projects involving scientific partners in DCs?*

9. *Are improvements to existing procedures / creation of new procedures initiated?*

   Not yet for GCR capacity building.

10. *Examples of current projects with CB in the context of GCR as primary objective:*

    Post Graduate Training Course on Groundwater Tracing Techniques (http://ihg.joanneum.at/)

EUROPEAN COMMISSION

1. *Is CB accepted as necessary by the GCR funding agencies in your country?*

   The European Commission has established as part of the on-going RTD Framework Programme a special programme (INCO) to promote scientific and technological co-operation internationally (i.e., beyond the EU and associated states), to reinforce Community capacities in the fields of science and technology, to support the achievement of scientific excellence within the wider international framework and to contribute to the implementation of the Community's external policy, also with the accession of new EU members in mind. INCO covers the following research areas:

   A. Co-operation with third countries

   B. Training of researchers

   C. Co-ordination: within FP5 and with other Community programmes; with COST, EUREKA and international organisations; and, with Member States

   The global INCO budget for the period 1998-2002 is 475 million €. A variable part of it is spent every year on RTD projects dealing with environmental quality and sustainable development of economic and social aspects in developing countries. Bursaries are provided to young researchers from developing countries that wish to co-operate with European researchers in the context of EU-funded research projects.

   Other EU RTD programmes such as Energy, Environment and Sustainable Development can normally not provide funds to researchers and institutions from developing countries.

2. *Are there any special funding schemes for CB initiatives?*

   Funding schemes for capacity building initiatives are included as an element of Global Change Research projects.

3. *Can scientists from abroad directly apply for and receive funds?*

   Applications have to be made by the research institutions as part of an international consortium.

4. *Do you concentrate on certain countries and/or regions?*

   INCO funding is directed towards:

   - Pre-accession states
   - Newly Independent States of the former Soviet Union and other Central and Eastern European Countries not in the pre-accession phase
   - Mediterranean partners
   - Developing countries

   Emerging economy countries and industrialised countries

5. *Do you interact with regional or international research programs/networks?*

   The European Commission operates ENRICH.

6. *Which other agencies in your country deal with CB, following which procedures?*

   N/A

7. *Are there coordinated efforts with regard to capacity building initiatives*

   No.

8. *Are there special criteria for funding projects involving scientific partners in DCs?*

   No.

9. *Are improvements to existing procedures / creation of new procedures initiated?*

   The EU Framework Programmes are periodically revised (major revisions every 4-5 years, minor revisions annually or bi-annually) and adapted to need. In the context of such general revisions the Global Change Research parts and the sections relevant for capacity building are adapted as well.

10. *Examples of current projects with CB in the context of GCR as primary objective:*

    As capacity building is not a goal as such but included as an element in Global Change Research projects (see answer to question 2), no projects exist whose primary objective is capacity building.

BMBF (GERMANY)

1. *Is CB accepted as necessary by the GCR funding agencies in your country?*

   BMBF has a long tradition of bilateral cooperation in science and technology with less developed countries. These co-operations always included training of experts and other measures of capacity building. During the last decades the scope of bilateral co operations has changed and increasingly covers various areas of Global Change Research. As a consequence capacity building in GCR has gained momentum as an important part of corresponding BMBF research programs.

2. *Are there any special funding schemes for CB initiatives?*

   BMBF has no dedicated funding schemes for capacity building in GCR. Capacity building measures are funded as an integral part of individual research projects.

3. *Can scientists from abroad directly apply for and receive funds?*

   No. In general bilateral cooperation is based on the principle of “no exchange of funds”. Foreign partners are expected to finance their contributions to common projects by themselves. Additional funds provided by BMBF for the support of specific capacity building measures in the partner countries are administered by the German institutions participating in the common projects.

4. *Do you concentrate on certain countries and/or regions?*

   In the past bilateral cooperation was mainly concentrating on less developed countries in South America and Asia, where a sufficient scientific home base was already available. In recent times, cooperation was extended also including a growing number of developing countries in Africa.

5. *Do you interact with regional or international research programs/networks?*

   Many of the joint research projects giving support to capacity building in developing countries collaborate with international GCR programs like GEWEX, LUCC, or DIVERSITAS. A specific cooperation with the networks for capacity building like START does not exist in the moment.

6. *Which other agencies in your country deal with CB, following which procedures?*

   The DFG and many research institutes and universities give support to capacity building measures by their own funds. One example is summer schools dedicated to the training of young scientists. A comprehensive overview of institutions involved and procedures adopted is not available.

7. *Are there coordinated efforts with regard to capacity building initiatives?*

   There are no coordinated efforts with regard to capacity building initiatives among national organizations. DFG has some joint efforts with national aid agencies.

8. *Are there special criteria for funding projects involving scientific partners in DCs?*

   Special criteria for the funding of projects involving partners in developing countries exist e.g. the so called Bremer Criteria), but their application is not mandatory and adapted to the specific needs of the individual research project.

9. *Are improvements to existing procedures / creation of new procedures initiated?*

   The existing procedures are the result of a long-ranging experience in bilateral cooperation with developing countries. They always have to be adapted to the

changing interests of the partner countries and the specific needs of the individual research project.

10. Examples of current projects with CB in the context of GCR as primary objective:

See examples attached.

General remarks:

In its relation to developing countries BMBF traditionally puts main emphasis on bilateral cooperation and less emphasis on unilateral help. Joint projects, therefore, are the regular instrument of cooperation, which creates a preference for those countries, where a certain level of scientific education and capacity already exists. The capacity building effects of those joint projects normally are long-lasting and efficient, because they exercise influence on the distribution of funds within the developing countries beyond the life-time of the projects themselves. Additional instruments, however, are seen to be necessary, if the scope of cooperation is to be extended towards countries with little or no scientific basis at home.

Examples:

BIOLOG

The scientific program BIOLOG has been established by the Federal Ministry of Education and Research of Germany (BMBF) to promote nationally and internationally co-ordinated research in the context of global change and decreasing biodiversity with emphasis on Europe and Africa. During the preparatory phase of 3 years capacity building represents a corner-stone of the ongoing projects, obtaining a basis for future, long-term studies.

Developing of human resources is a fundamental part in numerous projects. Now groups of young researchers are set up and cross-sector competence networks for integrated biodiversity research have been established. The African projects additionally focus on education of local scientists (e.g. lectures, (post-)graduate funding, research stays and further training in Germany, travel expenses for international conferences) and build up of technical infrastructure for biodiversity monitoring and examination of characteristic local problems especially in land-use and conservation.

Capacity building is also represented by the sub-program on biodiversity informatics. The new research in information technology, analysis and data management will create a tool to cope with the immense wealth of already available and actual generated research data of the BIOLOG program.

SHIFT

SHIFT (studies of human impact on forests and floodplains in the tropics) is a German-Brazilian co operation program in applied ecosystem research which has been started in 1991 with the intention to create bilateral projects in the context of global change.

The projects are financially supported by the Federal Ministry of Education and Research of Germany (BMBF) and the Federal Ministry of Science and Technology (MCT) of Brazil. Within this program, concepts of effective and feasible methods for sustainable use of land and conservation of national resources in Brazil are developed.

Capacity building can be regarded as an essential component of the SHIFT program and is realized in many different ways. Focussing the aspect of human resources, the education of young scientists in both countries is a major aim of SHIFT. Successful capacity building and a high rate of education is for example, realized in the Pantanal Ecology Project (PEP) in Cuiaba, which is a co operation project between the MPI Plön (Max Planck Institut für Limnologie) and the UFMT (Universidade Federal de Mato Grosso). During the ten years of the Pantanal Ecology Project, 24 master theses, 10 doctorate and post-doctorate theses and 104 trainees and bachelor's degrees on both sides were supported.

Additionally, bilateral German- Brazilian workshops were organized to promote the collaboration of young scientists and to improve integrated research (e.g. the workshop in Brasilia 1995 with special regard on interdisciplinarity).

In order to establish a long-term basis for independent scientific capacity in Brazil, summer courses for Brazilian researchers and graduate students in German counterpart institutes were established, training them in applying new technologies and methods. In numerous projects, especially in the Region of Amazonia, capacity building is supported by transfer of technical equipment from Germany to Brazil with the intention to build up local technical infrastructure in Brazil and to promote the indigenous scientific capacity.

WAVES

WAVES (Water Availability and Vulnerability of Ecosystems and Society in the Northeast of Brazil) is a co operational program between German and Brazilian research institutions aiming towards the joint investigation of the complex relationships between water resources, agro-ecosystems, landscape ecology and social economy in the semi-arid Northeast of Brazil in the context of global change. It has been started in 1997 and is funded by BMBF and CNPq (Conselho Nacional de Desenvolvimento Científico e Tecnológico).

Capacity building is one of the main goals of WAVES. Comprehensive research and activities have been carried out to form a basis for a transfer of knowledge into the region as well as the establishment of training programs for the application on site. Beyond it, research and education of young scientists in both countries lead to numerous theses. It can be expected, that the scientific results of WAVES will be used and applied in the future by researchers and local authorities in the region.

GLOWA-IMPETUS

GLOWA-IMPETUS (**I**ntegratives **M**anagement-**P**rojekt für einen **E**ffizienten und **T**ragfähigen **U**mgang mit **S**üßwasser) is an interdisciplinary project of the Universities of Cologne and Bonn**.** The aim is to better understand the regional hydrological cycle in the context of a changing environment. From the very beginning strong emphasis is put on the translation of scientific results into concrete problem solutions and mitigation strategies as a basis for political measures. The proposed work will be carried out within two catchments in Northwest and West Africa, namely of the river Drâa in the southeast of Morocco and of the river Ouémé in Benin. This choice is motivated by the possibility that the climates of Africa and Europe interact through teleconnections, and evidence that since the 1970s the droughts north and south of the Sahara have probably been related.

A very important aspect of the IMPETUS-GLOWA project is the intensive scientific/technical co-operation with partner organisations (government and non-government) and research institutions in Benin and Morocco. The aim is to contribute

substantially to the local capacity building in a large variety of disciplines and fields. In particular this encompasses the organisation of workshops and symposia on a regular basis, the training of experts, scientists, and technicians in new methodologies, and the set up and use of instruments and data processing software.

We already do or plan to interact with the following regional or international research programs:

- GEWEX
- CATCH
- SIGMADRAA
- DIVERSITAS
- LUCC
- HELP

THE GLOWA-IMPETUS project is making full use of the existing scientific competence in both Benin and Morocco by involving experts from local Universities, Government and Non-government Organisations.

The GLOWA-IMPETUS project is integrated in the scientific structures of both Benin and Morocco which is manifest in close co-operations with neighbouring projects (e.g. PROLUDRA in Morocco) and frequent exchange of ideas (e.g. during common workshops and common field campaigns).

GLOWA Volta

Project Background and Objectives:

The watershed of the Volta River is one of the poorest areas of Africa. Despite the presence of some mineral resources, average annual income is estimated in the region at US $800 per year. For the majority of the population, rainfed and some irrigated agriculture is the backbone of the largely rural societies and the principle source of income. Population growth rates exceed 3%, placing increasing pressure on land and water resources. Improved agricultural production in the West African savanna depends on the development of (near) surface water resources and their effective use. Such water development programs will have an impact on the availability of downstream water resources, in particular on those of the Volta Reservoir on which the urban population of Ghana depends for power generation.

Precipitation in the region is characterized by large variability, as expressed in periodic droughts. Unpredictable rainfall is a major factor in the economic feasibility of hydraulic development schemes, as witnessed by the power shortages which plagued Ghana in 1998. Any water resource management strategy will have to be based on a thorough understanding of this variability.

Given the dependence of land/atmosphere energy and water (vapor) exchange on land use, shifts in land use patterns will result in changes in weather patterns and rainfall characteristics in time and space. Future changes in the West African weather regimes will also be affected by global climate change. There is only limited understanding of the impact of global change on meso-regions such as West Africa, and even less knowledge of the feed-back of these effects on regional weather determining factors such as land-cover changes and the resulting shifts in evaporation and run-off. This complex feed-back system may have disastrous consequences for the region and may affect the availability of water and the strategy for managing this precious resource.

Given the necessity of a sustainable management of the water resources in the Volta basin, the central objectives of the GLOWA Volta project were defined as:

1. Analysis of the physical and socio-economic determinants of the hydrologic cycle,
2. Development of a scientifically sound decision support system for the assessment, sustainable use and development of water resources in the Volta Basin.

The decision support system (DSS) will provide a comprehensive monitoring and simulation framework enabling decision makers to evaluate the impact of manageable (irrigation, primary water use, land-use change, power generation, transboundary water allocation) and less manageable (climate change, rainfall variability, population pressure) factors on the social, economic, and biological productivity of water resources.

Capacity Building:

We distinguish three types of capacity building, namely implementation of the DSS, general cooperation with partner institutions, and education of Ph.D. students.

The DSS will not merely be a software package but truly a system including the human resources to utilize the DSS productively. In general, the expected users are those relatively highly placed technical decision makers in private and public organizations who manage resources and prepare policies. Although we will make executive level (ministers, directors general) aware of the DSS as well, it is not likely that they will make active use. Within the project, special attention has been given to institutional aspects to ensure that, first, our research answers real-world questions and, second, that the resulting DSS is firmly embedded within the relevant institutions. Direct capacity building will take place through training and gaming workshops in which the decision makers are made familiar with the possibilities of the DSS and its scientific content.

The science underlying the DSS will be state-of-the-art and most will be based on relatively new technologies such as computer simulations and satellite data. Operationalization of these technologies by adjusting them to West African boundary conditions and state variables takes place in close cooperation with our Ghanaian and Burkinabe partner institutes. The idea is to strengthen the structural capacity of our partners in such a way that they can produce scientific results relevant to the region at an internationally recognized level. For this, one needs better access to international scientific networks, better developed human resources, and advanced equipment. Each partner institute has appointed a contact scientist with whom project scientists work together. Such cooperation leads to joint international publications but also to new research proposals to cover special costs of the partner institutes, which have been successful on several occasions in the past year. Most human resource development takes place through the education of Ph.D. students associated with our partner institutes. We see this as the best way to guarantee that for all new technologies, trained scientific staff will be available. At present, a total of 21 of such projects have been foreseen.

The measurement-model-simulation chain is present throughout these projects. In general, simulations are used to minimize costly experimentation and to give access to otherwise unobservable entities, such as possible futures. In the relatively data poor and the absolutely resource poor environment of West Africa, the usefulness of simulation is even greater than in the developed world. Yet, we see until now little or

no application of these essential techniques in the region even though computers have become more widely available. Lack of hands-on experience among scientists and decision makers is most likely the main reason behind this deficit. Through post-graduate education, scientific collaboration, and embedding of the DSS, the GLOWA Volta project will help to close this gap.

DFG (GERMANY)

1. *Is CB accepted as necessary by the GCR funding agencies in your country?*

   CB is regarded as something very important, but paradoxically, there are only very limited mechanisms to fund CB outside the country.

2. *Are there any special funding schemes for CB initiatives?*

   DFG has had a particular funding instrument for CB in developing countries together with the BMZ, but despite advertising it several times it has not been used widely in the context of Global Change Research.

3. *Can scientists from abroad directly apply for and receive funds?*

   Since DFG has opened its funding instruments internationally, scientists from abroad can receive funds under specific circumstances. In many bilateral agreements funding is also available for scientists from abroad.

4. *Do you concentrate on certain countries and/or regions?*

   No concentration on particular countries or regions, but some countries, e.g. China of particular strategic importance.

5. *Do you interact with regional or international research programs/networks?*

   Very little direct interaction with the regional networks, except through funding of a German project which contributes to a program of one of the networks.

6. *Which other agencies in your country deal with CB, following which procedures?*

7. *Are there coordinated efforts with regard to capacity building initiatives*

   As stated above there is a coordinated effort of both the DFG and the BMZ in a joint funding instrument on CB, which is funded by the BMZ but operated by the DFG.

8. *Are there special criteria for funding projects involving scientific partners in DCs?*

   No particular criteria for the funding of projects involving scientists form developing countries except that they need a German partner and that the project contributes significantly to CB in the developing country. Examples can be given.

IRC (ICELAND)

Capacity building is commonly accepted as something that is very important. There are two special funds within the Icelandic Research Council (IRC) that directly are involved in capacity building (see attached paper*: The Icelandic Research Council - RANNIS: Structure and Strategy*). These funds are the Graduate Training Fund and the Buildings and Instruments Fund. Together these two funds represent 10% of the total budget of IRC. These funds support capacity building in all fields of science, not only global change research.

A foreign scientist from abroad can not apply for and receive funds from IRC. However, an Icelander working abroad can apply and receive funds from IRC. Iceland has difficulty in directly financing events and research work outside its own boarders. It can to some extent finance international scientific workshops and similar events in Iceland and can possibly on a case by case basis find means to fund participants from countries outside Europe in such events. Iceland through the IRC and other national institutions is willing to host and co-sponsor such events on a case by case basis when the location in Iceland seems particularly relevant.

Iceland places high priority on international co-operation in research. Nordic co-operation is a long-established tradition and covers a broad range of subjects and activities. Recently the Joint Committee of the Nordic Natural Science Research Councils in co-operation with the Nordic Council of Ministers decided to start a new program: *Nordic Centers of Excellence Pilot Program 2002-2007*. The research field will be: *Basic science in the field of global change, especially in the context of ecosystem responses to climate change, atmospheric processes and oceanographic processes*. Iceland has entered actively into European co-operation schemes (ESF,COST, and EUREKA) and is the Icelandic Research Council is coordinating Icelandic participation in the EU Framework program. The Council participates on behalf of Iceland in the STI policy-related work of the Committee for Science and Technology Policy of the OECD. Recently IRC has signed bilateral agreements with corresponding agencies in other countries, including the USA and China.

RCN (NORWAY)

Introduction

In Norway the Ministry of Foreign Affairs and The Norwegian Agency for Development Co-operation (NORAD) are responsible for measures to improve the scientific capacity in developing countries while the Ministry of Education, Research and Church Affairs (MERC) and the Research Council of Norway (RCN) are resonsible for capacity building in Norway.

The Ministry of Foreign Affairs (MFA) adopted in 1999 a *Strategy for strengthening higher education and research in the context of Norway's relations with developing countries.* As a follow up of this strategy there is an increasing co-operation between the main actors in this field, that is the MFA, NORAD, MERC, The Norwegian Council for Higher Education and the Research Council. NORAD is now evaluating the existing measures for support to research in developing countries to see if there is a need for making adjustments/creating new mechanisms.

What is mentioned above relates to capacity building in general. There is no specific priority given to capacity building in developing countries related to global change research.

Questions

1. *Is CB accepted as necessary by the GCR funding agencies in your country?*

   Global change research (GCR) is funded through the Research Council (30 – 40 % of all GCR in Norway), by the universities through their core funding, through EU-programs and from some private funds. The Research Council sees very clearly that capacity building in developing countries is needed. Since this is mainly the responsibility of NORAD, the main task of the Council is to pass on information and advise NORAD on questions related to GCR.

2. *Are there any special funding schemes for CB initiatives?*

   There are no special funding schemes for global change research.

3. *Can scientists from abroad directly apply for and receive funds?*

   Scientists from abroad can apply to the Research Council for fund, but the application should be forwarded through a Norwegian research institution.

4. *Do you concentrate on certain countries and/or regions?*

   No.

5. *Do you interact with regional or international research programs/networks?*

   The Research Council has contributed to workshops organised by START/IHDP and by ENRICH. The Council has acted as an intermediary to introduce representatives of START to NORAD.

6. *Which other agencies in your country deal with CB, following which procedures?*

   NORAD is the main responsible for capacity building in developing countries. Most of NORAD's support to universities and research institutions in developing countries is integrated with country programmes or funded through regional grants. NORAD also administers a scheme of grants for research and compe-

tence building in developing countries that emphasis South-South co-operation by supporting regional research institutions, especially in sub-Saharan Africa. A special fund for researches in this region is recently established. NORAD also offers a fellowship programme for further education at Norwegian institutions offering international diplomas and masters` degrees. Through an agreement with the Norwegian Council for Higher Education NORAD finances a research collaboration programme between universities in Norway and universities in developing countries.

7. *Are there coordinated efforts with regard to capacity building initiatives*

   a) *among national organizations?*

      No.

   b) *between national organizations and national or international aid agencies?*

      See Introduction and question 6.

8. *Are there special criteria for funding projects involving scientific partners in DCs?*

   No.

9. *Are improvements to existing procedures / creation of new procedures initiated?*

   See Introduction above.

10. *Examples of current projects with CB in the context of GCR as primary objective:*

    NORAD is supporting START/Nairobi for a three-year period 1999 – 2001.

NWO (THE NETHERLANDS)

Overview

In The Netherlands' science funding structure *capacity building in general* includes:

- two large international training institutes for higher education (ITC and IHE),
- a system for funding Ph.D.-fellowships for LDC-students (NWO-WOTRO),
- funding of short fellowships of LDC-students (NUFFIC),
- bilateral collaboration with East European countries (NWO),
- bilateral collaboration of (departments of) universities.

Specifically related to global change research:

- bilateral collaboration in 3 ongoing research programs (Indonesia, Vietnam, South Africa),
- funding of SE Asian research groups for contributing to LOICZ (Philippines, Vietnam, Malaysia),
- funding of START for a series of workshops (Directorate-General for Development Cooperation).

Questions

1. *Is CB accepted as necessary by the GCR funding agencies in your country?*

   In GC research projects capacity building is not an issue in itself. In GCR programs overseas collaboration with 'local' scientists is more or less standard and includes capacity building.

2. *Are there any special funding schemes for CB initiatives?*

   In several GCR programs overseas capacity building is explicitly included in the budget. This is the case in the bilateral coastal zone programs in SE Asia. Additionally, funding is provided for participation of SE Asian research groups in LOICZ (SARCS/WOTRO/LOICZ).

3. *Can scientists from abroad directly apply for and receive funds?*

   The NWO Foundation for Tropical Research (WOTRO) manages a budget from the Directorate for Development Co-operation for funding 20 new Ph.D.-fellowships for students from developing countries each year. These fellowships are not specifically related to GCR. Otherwise, there is no opportunity for foreign scientists to apply for funding from the science foundation.

4. *Do you concentrate on certain countries and/or regions?*

   Funds which are made available by the Directorate for Development Co-operation are earmarked for 18 countries that meet the criteria of this Directorate. The present focus of collaboration in GCR is at SE Asia and South Africa. In the bilateral program for collaboration with Russia, annually a GCR theme is included.

5. *Do you interact with regional or international research programs/networks?*

   Funded activities in SE Asia are embedded in the framework of SARCS. WOTRO has mediated in funding for START by the Directorate for Development Co-operation.

6. *Which other agencies in your country deal with CB, following which procedures?*

   No other organizations fund capacity building *specifically related to GCR*. Scientific capacity building *in general* is funded through the Netherlands organization for international cooperation in higher education NUFFIC and by some (groups at) universities. Two large international institutes for higher education are specifically devoted to scientific capacity building on remote sensing and related issues (ITC) and on hydraulics and environmental management (IHE).

7. *Are there coordinated efforts with regard to capacity building initiatives*

   There are no structured relations between the national institutions involved in capacity building. However, on the national level contacts are frequent due to the relatively small scientific community. Since most funding for capacity building originates from the Directorate for Development Co-operation, there are regular bilateral contacts with the Foundation for Tropical Research WOTRO.

8. *Are there special criteria for funding projects involving scientific partners in DCs?*

   There are no general rules, but usually capacity building is embedded in bilateral co-operation at institutional level.

9. *Are improvements to existing procedures / creation of new procedures initiated?*

   No new developments are foreseen.

10. *Examples of current projects with CB in the context of GCR as primary objective:*

    The only example with the *primary* objective of capacity building is the SARCS/WOTRO/LOICZ program in SE Asia. Other programs are bilateral and have primarily scientific aims on the Dutch side:

    - NL-Indonesia: Teluk Banten research program (LOICZ)
    - NL-Vietnam: Red River Delta research program (LOICZ)
    - NL-South Africa: Mixing of Agulhas Rings Experiment (WOCE)
    - NL-Russia: Paleoclimatology; River systems (PAGES; BAHC)

NRF (SOUTH AFRICA)

Overview

South Africa is grappling with the legacy of the previous racially discriminating political regime. In the research milieu, black and female researchers as well as certain institutions of higher education were disadvantaged. Hence the emphasis on corrective action policies in an organization which is aligned to national policies such as the National Research Foundation (NRF). Capacity building is promoted both at the individual as well as the institutional levels and the NRF's relevant strategy is attached hereto for further information.

A 'Draft Strategic Plan for Research Capacity Development' in South Africa can be obtained from Johan Pauw (johan@nrf.ac.za) or the IGFA Secretariat (carola.roeser@dlr.de).

Questions

1. *Is CB accepted as necessary by the GCR funding agencies in your country?*

   Very much so, and with specific emphasis on black and female researchers.

2. *Are there any special funding schemes for CB initiatives?*

   At the national level South Africa has funding schemes of a general nature which may or may not include GCR projects. GCR projects funded by the National Research Foundation (NRF) usually include capacity building elements. The emphasis is on student training and the improvement of the academic qualifications of staff members of tertiary education institutions and museums. The NRF's funding goes primarily to academic institutions and as such those institutions are jointly responsible for capacity building as supported by the NRF. The relevant strategy document is attached.

3. *Can scientists from abroad directly apply for and receive funds?*

   Very limited funds are available for post doctoral positions. Other funds such as for fellowships and key note speakers at conferences must be applied for by a South African organization. Where bilateral collaboration exist between NRF and partner organizations abroad, scientists from that country may apply directly to the partner organization. The names of such organizations can be supplied.

4. *Do you concentrate on certain countries and/or regions?*

   Generally speaking there is a focus on the South African Development Community (SADC), but also on Europe.

5. *Do you interact with regional or international research programs/networks?*

   Individual South African researchers interact directly but the South African Global Change Committee is part of the ICSU family and functions under the auspices of the NRF.

6. *Which other agencies in your country deal with CB, following which procedures?*

   Government departments such as the Department of Environmental Affairs & Tourism, the Department of Water Affairs Forestry, the Department of Agriculture and the Department of Arts, Culture, Science & Technology, universities as well as parastatal science councils such as the Agricultural Research Council, the

Council for Scientific and Industrial Research, the Human Sciences Research Council and the Council for Geosciences have general capacity building initiatives which includes own staff, the youth and the public at large. These initiatives include websites, feature years (e.g., Year of Science & Technology), exhibitions, newsletters, etc. Limited bursary schemes are in operation with a view to recruitment and staff training and attendance of scientific conferences are ongoing activities. Industry in South Africa is primarily concerned with the effects of climate change and an organization like ESKOM, the national electricity supplier, has established a center called the African Center for Energy and the Environment (ACEE) which organizes workshops and training courses on related topics for government and industry decision makers.

7. *Are there coordinated efforts with regard to capacity building initiatives*

   a) *among national organizations?*

      To a limited extend. A National Climate Change Committee seeks to coordinate climate change related activities and policies between government and a broad stakeholder base. This committee has done little to promote capacity building so far. The SA Global Change Committee has managed to nominate a few young South African researchers to attend relevant conferences and committee meetings but has no funding of its own. The NRF and academic institutions do coordinate some of their capacity building initiatives with regards to student and staff training, but this is not specifically aimed at GCR. A long-term ecological research network is about to be established in South Africa and should provide ample opportunities for hands-on involvement by schools and communities, as well as the training of students.

   b) *between national organizations and national or international aid agencies?*

      The NRF manages a number of country to country collaborative research programs, most of which includes capacity building criteria but GCR is only a subset of some of those programs. The SAFARI 2000 project which was primarily supported by NASA (USA) and the South African Department of Arts, Culture, Science & Technology, and to a lesser extend by the NRF, has made an effort to inform the public through the distribution of educational material to schools.

8. *Are there special criteria for funding projects involving scientific partners in DCs?*

   The country to country programs mentioned under 7 always include at least one South African partner.

9. *Are improvements to existing procedures / creation of new procedures initiated?*

   Nothing significantly, but for a new policy on higher education which will provide major incentives to academic institutions to increase their throughput of post graduate students.

MCYT (SPAIN)

1. *Is CB accepted as necessary by the GCR funding agencies in your country?*

   The general answer is no, even within our country. Capacity building is recognized as a very important subject in scientific cooperation but nothing is done with this respect in Spain, at least specifically in the area of Global Change. Something is done in relation to sustainable development. We can choose some special programs among those for international cooperation in the field of scientific research like CYTED (Iberoamerican Program of Science and Technology for Development, http://www.cyted.org) where 21 Iberomarican countries participate and the more emphasis is made in networking, mobility of researchers, organization of seminars and workshops, dissemination and transference of results in different areas. Within this Program there is not a specific area for Global Change Research but some related lines of scientific cooperation (Biodiversity, renewable sources of energy, agriculture, etc.). The AECI, Spanish Agency for International Co-operation (http://www.aeci.es) is also promoting an integrated program for Iberoamerica , the Program ARAUCARIA with two main objectives: the conservation of biodiversity and the training of specialists in different fields within the environment, conservation and sustainable use of natural resources.

2. *Are there any special funding schemes for CB initiatives?*

   No.

3. *Can scientists from abroad directly apply for and receive funds?*

   It is possible for Iberoamericans within those previously mentioned programs and for Europeans of the European Union to participate, as a part of a broader Spanish team, in National Programs. But in all cases the funds has to be expended in Spain.

4. *Do you concentrate on certain countries and/or regions?*

   Mainly the European Union, the Iberoamerican countries and the circum-Mediterranean countries.

5. *Do you interact with regional or international research programs/networks?*

   Mainly or even exclusively with ENRICH and very little with START up to my knowledge.

6. *Which other agencies in your country deal with CB, following which procedures?*

   AECI of the Ministry of Foreign Affairs. The procedures dealt with an annual call for proposals.

7. *Are there coordinated efforts with regard to capacity building initiatives*

   Yes in a very broad sense.

8. *Are there special criteria for funding projects involving scientific partners in DCs?*

   Not known.

9. *Are improvements to existing procedures / creation of new procedures initiated?*

   Not known.

SNF (SWITZERLAND)

Overview:

Many institutions in Switzerland cope with capacity building. Here we will mention only three of them: SDC (Swiss Agency for development and co-operation), KFPE (the Commission for Research Partnership with developing countries) and SNSF (Swiss National Science Foundation).

The SNSF and the SDC have several common instruments to promote capacity building in general and in global change related topics. Scientific Co-operation between Eastern Europe and Switzerland (SCOPES) is one of them. Scientists can apply for funds for Joint Research Projects (JRP), Institutional Partnerships (IP) or Conference Grants (CG). These scientific collaborations aim to: 1) strengthen of excellent research teams by contributing to the improvement of their working conditions in specific research projects (strengthening of capacities); 2) strengthen of research and educational institutions by providing know-how (strengthening of institutions); 3) overcome the danger of scientific isolation by facilitating international networking activities of individual scientists with mobility schemes; 4) strengthen of research funding agencies which allocate their funds on the basis of competition and peer review.

With developing countries, the SDC and the SNSF developed two instruments to further research partnership. Research partnerships (RP) with developing countries are aimed at supporting the scientific north-south relationship and, in doing so, to strengthen the scientific competence of researchers and research institutions in southern as well as in northern countries. The NCCR-North/South (National Competence Centre in Research) is a new instrument co-financed by the SNF and the SDC for a period of ten years. Capacity building is one of the core objectives of the NCCR-North/South. In substance, the NCCR North-South aims to carry out research on major syndromes of global as well as local change in developing and transition countries, and to make significant contributions to designing measures for mitigating these syndromes. The programme will be realised through research partnership between Swiss institutions and southern partners. The main topics are: land degradation; restricted access to, and availability of fresh water; inadequate environmental sanitation; problems of human health and limited health services; lack of potential to alleviate poverty; conflict, particularly in resource management.

Finally, the Commission for Research Partnership with developing countries (KFPE) plays a strategic role in capacity building in Switzerland. KFPE's overall aim is to contribute to sustainable development at global level through research partnership. In Switzerland, the Commission plays the role of an inter-institutional platform which aims to promote in the scientific and political milieu the necessity of research partnerships with southern countries. The SNF is represented in the executive board of the KFPE.

Questions:

1. *Is CB accepted as necessary by the GCR funding agencies in your country?*

   Yes, its one of the important topics.

2. *Are there any special funding schemes for CB initiatives?*

Yes, a special funding scheme exists for institutional empowerment and joint research projects with the southern and in transition countries. But not all of these projects deal specifically with GCR issues. For specifications, refer also to answer 8-10.

3. *Can scientists from abroad directly apply for and receive funds?*

   Research institutions in Switzerland can apply for funds for their foreign partners (Echanges Universitaires, Institutional Partnership, Joint Research Projects, Joint Seminars).

4. *Do you concentrate on certain countries and/or regions?*

   This is depending on the instrument. In research partnership, only the priority countries of the SDC (and their neighbors) are concerned. We have also bilateral co-operation agreements with founding agencies in developing countries. Finally, with eastern countries the SNF finance joint research project and institutional partnerships (SCOPES/Scientific Co-operation between Eastern Europe and Switzerland: 200 projects are running). Once again, these instruments not only cope with GCR issues.

5. *Do you interact with regional or international research programs/networks?*

   We are not directly implicated.

6. *Which other agencies in your country deal with CB, following which procedures?*

   KFPE (see answer 8). SDC has many projects in the South that deal with GC and sustainable development. Most of these projects relate to CB. Universities, specialized institutes and NGO's working in the field of sustainable development also deal with CB.

7. *Are there coordinated efforts with regard to capacity building initiatives*

   KFPE is the coordinating organ for research partnerships with developing countries. The Swiss Commission for Research Partnership with Developing Countries (**K**ommission für **F**orschungs **P**artnerschaften mit **E**ntwicklungsländern), KFPE, is a Commission of the Council of the Swiss Scientific Academies (CASS). KFPE membership consists of members (ad personam) and delegates of associated institutions. The Commission has a secretariat in Bern. KFPE's overall aim is to contribute to sustainable development at the global level through research partnerships.

   Its activities are based on the following premises:

   - Research is an integral part of development. It can be used as a tool to help solve urgent problems from the international to the local level.
   - Above all, basic research capacity needs to be developed and firmly anchored in economically disadvantaged countries.
   - This can be accomplished through long-term development-oriented research partnerships.

   Tasks and responsibilities

   The Commission focuses on persuading the Swiss scientific community and Swiss authorities of the importance of building up and consolidating research capacities in developing countries, and of contributing actively in meeting this challenge. KFPE

- collaborates closely with circles that have a decisive influence on Swiss research policy;
- is a network of Swiss institutions that have long experience of research partnerships with developing countries;
- supports members of this network in efforts to expand, strengthen, and implement research partnerships;
- creates links between the Swiss research community and politicians, the business community and the public, in order to foster such partnerships;
- cultivates and maintains important international linkages;
- functions as a "window" on the South and as an information center.

In particular, KFPE seeks to promote implementation of the "Swiss Strategy for the Promotion of Scientific Research in Developing Countries". In addition, in 1998 KFPE formulated "Guidelines for Research in Partnership with Developing Countries: 11 Principles", which are available free of charge in five languages.

Services available

KFPE arranges contacts, disseminates information, and compiles documentation. It provides advice to grant applicants and assessing agencies who seek help when planning or assessing research projects involving partnerships. KFPE organizes and participates in lecture series, seminars and other events aiming to raise public consciousness of the value and importance of cooperation between the North and the South in the field of research.

Membership

- Full members of the commission The commission is composed of members from Switzerland and other countries with experience in the area of research partnerships with developing countries.
- Associated institutions (with consultative function). Membership on the commission is also open to institutions that promote research or are involved in development co-operation, as well as to research institutions, government offices and foundations — about 60 institutions are associated with KFPE.

See also: KFPE 2001: Enhancing Research Capacity in Developing and Transition Countries. Geographica Bernensia, 316pp. (ISBN 3-906151-49-2)

http://www.kfpe.ch/about/conf2000.html

8. *Are there special criteria for funding projects involving scientific partners in DCs?*

Yes, in collaboration with the SNF, the KFPE (Swiss Commission for Research Partnership with developing countries/ www.kfpe.ch) developed guidelines for research partnership with developing countries. These guidelines can be resumed with 11 principles which are the following: 1) decide on the objectives together; 2) build up mutual trust; 3) share information/develop networks; 4) share responsibility; 5) create transparency; 6) monitor and evaluate the collaboration; 7) disseminate the results; 7) Apply the results; 9) Share profits equitably; 10) Increase research capacity; 11) Build on the achievements.[2]

The SNF and the SDC (Swiss Agency for Development and Co-operation) are financing together research partnership with developing countries for three years. The research partnership must follow as well scientific criteria as partnership

[2] KFPE (Swiss Commission for Research Partnership with developing countries), *Guidelines for research partnership with developing countries*, 2000 (2nd edition), p. 1.

guidelines. Capacity building in developing countries (as in Switzerland) is a central target of this instrument. Ten research partnership are running until the end of 2003. Not all projects are in relation with GCR.

9. *Are improvements to existing procedures / creation of new procedures initiated?*

   The SNF will finance for the following ten years the NCCR North-South (National Competence Center in Research) and the NCCR Climate. The objectives of the NCCR is to strengthen Switzerland position and to reorganize research domains of strategic importance. The NCCR North-South aims to carry out research on major syndromes of global as well as local change in developing and transition countries, and to make significant contributions to designing measures for mitigating these syndromes. The program will be realized trough research partnership between swiss institutions and south partners. The main topics are: land degradation; restricted access to, and availability of fresh water; inadequate environmental sanitation; problems of human health and limited health services; lack of potential to alleviate poverty; conflict, particularly in resource management. Capacity building (or empowerment) is one important aspect of the NCCR N-S: "*Trough its activities and partnership, the NCCR N-S will contribute to developing the capabilities of partner institutions and societies at large in developing and transition countries, by strengthening their positions vis-à-vis national and international research communities and network agendas, by introducing state-of-the-art methodologies for addressing syndromes of global change, and by using generic, strategic, adaptive and applied research to help these institutions find sustainable solutions with the means available in their own local contexts*".[3] The NCCR N-S begins in the third quarter of 2001. More information about the program: *www.cde.unibe.ch/programmes/global/glo24.html*

10. *Examples of current projects with CB in the context of GCR as primary objective:*

    See point 9. Examples of research partnership with developing countries:

    - Interface between towns and rural areas in Equator: to an integrated territorial development.
    - Learning Processes and Platforms for Negotiating sustainable Resource Management: Potentials and Constrains of "Autodidactic Learning for Sustainability in an Intercultural Perspective.
    - Studies of mathematical and numerical models involved in Sahelian irrigation: application to water resource management and to pollutant transport in saturated and non saturated porous media.
    - Conservation of biodiversity in Lama forest – Role of forest plantations for the variability of natural forest.

[3] Swiss Association of Research Partnership Institutions (SARPI), *NCCR North-South: Research Partnership for Mitigating Syndromes of Global Change*, 2000, p.16.

NSC (TAIWAN)

Questions:

1. *Is CB accepted as necessary by the GCR funding agencies in your country?*

   Yes.

2. *Are there any special funding schemes for CB initiatives?*

   Yes.

3. *Can scientists from abroad directly apply for and receive funds?*

   No, but this mechanism is being planned through the “Sustainable Taiwan: Vision and Strategies Project”.

4. *Do you concentrate on certain countries and/or regions?*

   Yes, Asian (Southeast Asia) region.

5. *Do you interact with regional or international research programs/networks?*

   Yes, particularly for START.

6. *Which other agencies in your country deal with CB, following which procedures?*

   Besides the National Science Council, the EPA (Environmental Protection Agency) does offer some training workshop and is also involved in the capacity building efforts.

7. *Are there coordinated efforts with regard to capacity building initiatives*

   a) *among national organizations?*

      Yes.

   b) *between national organizations and national or international aid agencies?*

      Yes.

8. *Are there special criteria for funding projects involving scientific partners in DCs?*

   No.

9. *Are improvements to existing procedures / creation of new procedures initiated?*

   Yes.

10. *Examples of current projects with CB in the context of GCR as primary objective:*

    For instance, “Sustainable Taiwan: Vision and Strategies Project“ and “Global Change Service Project: International Participation, Forum, and Communication“.

General remarks:

The Commission on Sustainable Development Research (CSDR), National Science Council plays a major role in funding, promoting, and organizing the global change researches in Taiwan. In addition to funded projects within the scopes of International programs such as IGBP, WCRP and IHDP, two projects, “Sustainable Taiwan: Vision and Strategies“ and “Global Change Service Project: International Participation, Forum, and Communication “, have been persistently sponsored, of which accomplishments are closely with respect to capacity building initiatives. Through both projects,

the following have been done to build scientific capacity and extend the application for global change researches:

- Training of young scientists and experts through postdoctoral program
- Periodic workshop for global change researches sponsored by CSDR, frequent seminars among individual research groups
- Information exchanges through Newsletter
- Integration of present database and development of data analysis procedure for building the scientific index for assessment of national sustainability
- Promotion of international collaborations

NERC (UNITED KINGDOM)

IGFA has defined capacity building as ***all measures to improve the scientific capacity in developing countries to contribute to Global Change Research*.** Bodies such as the Research Councils, the Royal Society and Government departments support work which includes global change research, but none of them could be said to have capacity building as a primary responsibility or objective. However, where the science which is funded is global change oriented work in a developing country involving collaboration with its scientists, capacity building is likely to be an indirect outcome.

The UK appears to have few initiatives which approach IGFA's definition of capacity building. One which approaches it is the Darwin Initiative for the Survival of Species (see *http://www.nbu.ac.uk/darwin/)*. This aims to help safeguard the world's biodiversity and is funded and run by the Department for Environment, Food and Rural Affairs, DEFRA (formerly the Department of the Environment, Transport and the Regions). The Initiative was announced by the British Government at the Earth Summit held in Rio de Janeiro in June 1992. It aims to:

- **assist countries rich in biodiversity but poor in resources** with the conservation of biological diversity and implementation of the Biodiversity Convention.
- **draw on British expertise** in the field of biodiversity.

One of the Initiative's project areas is **institutional capacity building**.