

Investigating the potential role of National Committees in Future Earth

Project team:

(no 2-10 are in alphabetic order)

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Contents

Executive summary	3
1. Introduction	5
1.1. Background	5
1.2. Objectives	6
2. Methods	7
3. Results and discussion	8
3.1. Current roles and engagement of National Committees in the GEC Programmes	8
3.1.1. Organisation of NCs	8
3.1.2. Activities and collaboration with the GEC Programmes	9
3.1.3. Examples of NCs and equivalent organisations in operation	13
3.2. Scope for future engagement of National Committees in Future Earth	14
3.2.1. Role of NCs in Future Earth	14
3.2.2. Potential tasks of NCs	17
3.3. Organisation of national committees for Future Earth at the national level	18
3.4. A global network of National Committees; Added value and organisation	21
4. Conclusions and recommendations	23
Acknowledgements	29
References	29
<i>Annex 1; Questionnaire</i>	
<i>Annex 2; Letter from the European Alliance of National Global Change Research Committees to Future Earth Transition Team</i>	
<i>Annex 3; Response from Switzerland to IGBP on the role of national committees in Future Earth</i>	
<i>Annex 4; Response from Sweden to IGBP on the role of national committees in Future Earth</i>	

Executive summary

In November 2013, The Future Earth Interim Secretariat invited the Swedish Secretariat for Environmental Earth System Sciences (SSEESS, also representing the Swedish National Committee for Global Environmental Change) to lead a consultative process on the nature and structure of national-level coordination for Future Earth with some of the key players among National Committees (NC) globally. The request was accepted by SSEESS and the Swedish NC represented by SSEESS. SSEESS teamed up with NCs in Argentina, Germany, Japan, Switzerland, and USA (some other NCs were also approached without success). Four of these six NCs represented in the project team were already organized as Future Earth Committees. Subsequently, SSEESS also invited representatives from IHDP and IGBP to join the project team, to share experiences and ideas from a programme perspective.

One specific objective of the consultative process was to examine how NCs can support the implementation and reinforce the aim and vision of Future Earth on a national level. Options for establishing a global network of NCs for Global Change Research/Future Earth were also explored. The underlying assumption for this consultative process was that Future Earth will broadly integrate NCs in its national level activities and strategies. Other options for national coordination may be considered, but this was only briefly treated in this work.

A questionnaire was sent to national committees to increase the understanding of the actual work, activities and structures of existing and previous national committees, their lessons learned, as well as their perceptions on the potential role of NCs in Future Earth. Semi-structured interviews with staff from GEC (Global Environmental Change) Programmes on their experiences, needs, contributions, potentials, and administration/coordination of NCs were conducted during February-May 2014. To gather more detailed information and advice from NCs, four of the project team members that are affiliated with NCs prepared reports on the current role and functions of their respective NC, and on the options for multinational collaboration in Future Earth. SSEESS also invited representatives from IGBP, IHDP and DIVERSITAS secretariats to contribute with opinion pieces based on the same issues. Continued in depth discussions on conclusions and recommendations took place within the project team during July-October 2014.

It was concluded that National Committees (NCs) have in a number of cases made important scientific, communicative, administrative and financial contributions to the work of the GEC Programmes and thereby have a proven potential. Well functioning NCs and resourced networks of NCs could provide significant support to Future Earth, including its core projects.

A well coordinated global network, including regional nodes, of NCs could, moreover, share experiences and expertise on specific global and regional problems, identify and take joint positions on common research priorities, integrate and disseminate knowledge, promote multi-national GEC research, offer expert opinion on policy and practice, identify and possibly also coordinate funding opportunities, support research an institutional capacity building, engage regional stakeholders in dialogues and co-design of research activities.

However, the capacity, organisation, activity level, and potentials have varied greatly among NCs and their networks in the past, and GEC programmes have had limited resources to fully

engage even the well functioning NCs. There has also been a lack of strategic directions and statutes for establishing and running NCs. Only a certain proportion of NCs have regularly interacted in depth with the GEC programmes.

Provided that the strategic and organisational structure of Future Earth anticipates active participation of NCs on a global scale, the findings of the consultative process prompt a number of recommendations. These recommendations show two different pathways for NCs to emerge and operate that differ in terms of the degree of integration and shared strategy between the NCs and the globally distributed secretariat of Future Earth – either with global or regional hubs. Generally, it is recommended that Future Earth provides clear strategic guidance to and develop a coherent communication strategy in relation to NCs, provides support to NCs to varying degrees, and accepts diversity among NCs in terms of main foci, institutional set up, and activity level.

NCs should, also, have a broader representation of stakeholders and more flexible national networks attached than most NCs have today, catering to both interdisciplinarity and transdisciplinarity. It is recommended that NCs are organised, or organise themselves, in regional nodes, and that the Future Earth Global Secretariat is involved in, and at a minimum informed in detail on, the process of formation of new NCs. Future Earth should, moreover, initially focus on only 8-10 NCs for more extensive collaboration.

1. Introduction

1.1. Background

International coordinated science is heavily dependent on the willingness and support at the national level. Thus the role of nations in implementing Future Earth research beyond participating in the governing bodies (i.e. Steering Committee and Engagement Committee) needs to be clarified. The success of Future Earth as a global programme will require mobilising scientists and other stakeholder communities, including governments, business, and civil society, from global to local levels. In this respect, national committees (NCs) have played an important role in supporting the implementation of ICSU's global environmental change programmes (DIVERSITAS, IHDP, IGBP, WCRP) at the national level. The roles of NCs as described by IGBP, IHDP, and DIVERSITAS are presented in Box 1.

As DIVERSITAS, IHDP, and IGBP are being integrated into Future Earth, NCs are being formed or existing national committees are aligning themselves with Future Earth in a number of countries. A consultation on the opportunities for pro-active engagement of NCs in delivering Future Earth is therefore timely. In November 2013, The Future Earth Interim Secretariat invited the Swedish Secretariat for Environmental Earth System Sciences (SSEESS, also representing the Swedish National Committee for Global Environmental Change) to lead a consultative process on the nature and structure of national-level coordination for Future Earth with some of the key players among NCs globally.

Box 1:

Roles of national committees as briefly described by IGBP, IHDP, and DIVERSITAS on their websites:

IGBP

- Create links between national and international global change research
- Help national coordination of relevant studies
- Assist funding strategies to support IGBP's research
- Connect developing-world scientists with researchers in the developed world.

IHDP

"When working on a global scale, it is important to incorporate local and regional needs and perspectives. IHDP has set up a global network of national committees, contact points, and global change committees to cover these needs. These entities are organised groups of researchers acting as focal points for IHDP within their respective countries. Most are in developing countries, bridging the North-South divide. They raise the visibility and capacity of the human dimensions research community and incorporate funding agencies, NGOs and decision-making communities into our activities. They set research priorities and foci, establish links to our projects, and contribute to the regional and global body of knowledge and research on these issues. Members provide the substantial contributions needed to complete IHDP's global research agenda."

DIVERSITAS

One of DIVERSITAS' primary objectives is to create a worldwide network in support of biodiversity science that fosters integration across disciplines, creates a science-policy interface, and establishes links at regional and international levels. The main goal of the National Committees is to enlarge DIVERSITAS' scientific and policy networks, thereby helping to establish crucial links between national biodiversity programmes and international activities. The National Committees make it possible to implement, and adapt where necessary, the DIVERSITAS science priorities to local and regional concerns.

DIVERSITAS has two categories of National Members:

- Full Members: countries who provide an annual financial contribution to DIVERSITAS (and may have an established national committee). These Members play a crucial role in shaping the programme. Full Members are, for example, involved in discussions on future scientific priorities of DIVERSITAS, and on future budgets.
- Affiliated Members: countries who have identified a contact point or assembled a national committee, but who do not contribute financially to the programme.

The request was accepted by SSEESS and the Swedish NC represented by SSEESS. SSEESS teamed up with NCs in Argentina, Germany, Japan, Switzerland, and USA (some other NCs were also approached without success). Four of these six NCs represented in the project team were already organised as Future Earth Committees. Subsequently, SSEESS also invited representatives from IHDP and IGBP to join the project team, to share experiences and ideas from a programme perspective.

The underlying assumption for this consultative process is that Future Earth will broadly integrate NCs in its national level activities and strategies. Other options for national coordination may be considered, but this was only briefly treated in this work.

1.2. Objectives

One specific objective of the consultative process was to examine how the NCs can support the implementation and reinforce the aim and vision of Future Earth on a national level.

Examples of questions that were treated:

- Are NCs able to communicate Future Earth research to national stakeholders, and if so how?
- How can the NCs at the national level, coordinate and give inputs for international agenda-setting on global environmental change and sustainability issues?
- How can NCs develop and animate arenas for stakeholder engagement?
- How can NCs develop new scientific and engagement initiatives within the framework of Future Earth?
- How can NCs strengthen national capacities and national science systems to facilitate researchers' participation in Future Earth?

Options for establishing a global network of NCs of Global Change Research/Future Earth were also explored. Examples of questions that were discussed during the international consultation are:

- What is required, in terms of resources, organisation, etc, for such a global network to be established and be run successfully?
- What should be the aim and vision of such a network?

2. Methods

The following methods were used to gather information, discuss, describe, and learn from the previous and current engagement of national committees in the ICSU Global Environmental Change Programmes (hereafter referred to as GEC Programmes), the current landscape of national committees and their activities, as well as their potential role and organisation in relation to Future Earth.

Questionnaires to national committees

A questionnaire (Annex 1) was prepared and sent to 113 NCs to increase the understanding of the actual work, activities and structures of existing and previous national committees, their lessons learned, as well as their perceptions on the potential role of NCs in Future Earth. The questionnaire was sent out on March 14 and responses were requested on or before March 28 2014. Of the 93 recipients of the questionnaire (20 questionnaires bounced), 29 (32%) responded. The responding NCs came from countries in several continents: Europe (11), Asia (7), Africa (3), Oceania (2), North America (1), and South America (1). The respondents as a whole represented all the GEC Programmes. Some liaise with a single programme, and some with a combination of some or all of the programmes. The responses are treated anonymously.

More specifically, the questions posed in the questionnaire aimed to gather information from the NCs on:

1. The most important things that national committees in general can contribute to Future Earth.
2. The limiting factors and the efficiency of different approaches for the operation of NCs
3. What Future Earth could do to facilitate and increase the effectiveness of national committees
4. How a global network of NCs preferably should be organized.

Interviews with GEC Programme secretariats

Semi-structured interviews with staff from the IGBP, DIVERSITAS, and IHDP programmes on the experiences, needs, contributions, potentials, and administration/coordination of NCs were conducted during February-May 2014.

Reports from project team members

To gather more detailed information and advice from NCs, four of the project team members affiliated with NCs, most of which are already organized as Future Earth Committees, prepared reports on their current role and functions, and on the options for multinational collaboration among Future Earth NCs at a global level. Also, representatives from IGBP, IHDP, and DIVERSITAS contributed with opinion pieces based on the same issues upon invitations from SSEESS.

The following questions were posed in the request for these reports and opinion pieces:

- *How do/will your NC communicate Future Earth to national stakeholders?*
- *How do/will your NC coordinate and provide national inputs to international agenda-setting on global environmental change and sustainability issues?*
- *How do/will your NC develop and animate arenas for stakeholder engagement?*
- *How do/will your NC develop new scientific and engagement initiatives within the framework of Future Earth?*
- *How do/will your NC strengthen national capacities and science systems to match the scope of Future Earth?*
- *What should be the aim and vision of a global network of NCs?*
- *What is required, in terms of resources, organisation etc, for such a global network of NCs to be established and be run successfully?*

The reporting NCs were also invited to add issues/points that they thought were missing.

Project team meetings and preparation of the report

SSEESS summarized the collected information, views and recommendations from the questionnaire, interviews, reports and opinion pieces, and other more dated documentation. A draft report was circulated to the project team for comments and further elaboration in May-June 2014. Representatives from NCs in Botswana and Portugal reviewed and provided comments on the draft report in June 2014. Continued in depth discussions on conclusions and recommendations took place within the project team during June-October 2014.

3. Results and discussion

3.1. Current roles and engagement of National Committees in the GEC Programmes

3.1.1. Organisation of NCs

The NCs of GEC Programmes differ in scope and affiliation due to national responsibilities and history. In some countries, the programmes are represented by separate NCs (or single persons as national contact points), while other countries have one committee for all GEC programmes. In total, around 70 countries have some form of NC (see www.diversitas-international.org, www.igbp.net, www.ihdp.unu.edu for details). Most of the NCs representing ICSU's current GEC Programmes are affiliated with national academies (most commonly members of ICSU), some NCs are mandated by national research funders (e.g. Germany, UK), and a few by public agencies or a mixture of all. This causes a significant variability in terms of tasks and resources (financial/human) of NCs, including capacity to

carry out activities. Another view presented was that the organisation of committees themselves is quite heterogeneous; some are extremely well organised and influential while others struggle with basic infrastructural issues.

Moreover, according to interviews with GEC Programme representatives, there seems to be a correlation between the existence of an NC in a country and the country's financial contribution to the programme in question. Notably, national contributions to programmes are often channeled through NCs, as in the case of China, Netherlands, and Sweden among many examples from IHDP. Most of DIVERSITAS' core funding comes from national contributions, of which 50% are channelled through or facilitated by the respective country's NC. NCs can also initiate national funding of i.e. Core Projects' International Programme Offices.

Furthermore, it was noted from the GEC Programmes that several NCs have been created and organized in a very informal way (e.g. based on personal contacts/friendships). This has sometimes resulted in not truly institutionalized NCs (and national contact points), so that their level of activity and interaction with the Programmes' secretariats depended strongly on personal relationships or current interests of the NC contact persons. It has not always been clear whether the committee is representative of the science and scientists in a given country. Programmes have had no say in how a committee is formed or closed. With this said, informal and individual initiatives can obviously also benefit the work of NCs, and there are several examples where engaged key individuals have ensured a strong interaction with the science communities in the respective countries and sustained high activity levels of NCs.

In conclusion, NCs differ in scope and affiliation due to national responsibilities and history, some NCs play a crucial role in ensuring the core funding of GEC Programmes, and NCs often do not operate as a network in a country (i.e. committee members are often the only representatives in a country).

3.1.2. Activities and collaboration with the GEC Programmes

Interviews suggested that the GEC Programmes considered the NCs as an important part of their networks, and a vital link to national activities and priorities. Several specific examples of successful collaboration with and contributions from NCs (largely in accordance with the specified objectives of NCs presented in Box 1), given during the interviews illustrate the potentials of NCs.

In the questionnaire, the NCs were asked what they consider to be the main focus of their work. Out of five alternatives, with the possibility to add other options, the alternative "Encouraged national researchers to become involved in the program" was most commonly ticked (9 of 23 respondents, Fig. 1). No one ticked "Assisted the program by influencing the level of relevant research funding in your country" as "main focus".

The responses in the questionnaires indicate that most of the respondents' NCs are active; only four of the 28 responding NCs that existed in 2013 had no activities at all that year, and only three have had no activities for the last three years. It is, however, worth noting that the results of the questionnaire may be biased toward the most active and well functioning NCs. The most common activities among responding NCs were "Scientific/Science-policy Workshops" and "Other Meetings". Almost half of the responding NCs considered their most important contribution to the programmes to be their "linking of national expertise and research priorities to the programme" (Fig. 2).

During interviews with representatives of GEC Programmes it was clear that maintaining a continuous dialogue and engagement with the NCs on a broader scale requires substantial human resources, and that the full potentials of enrolling NCs have not been reached. It is estimated that, on average, far less than half of the NCs responded and delivered in response to the GEC Programmes' calls for e.g. national activity reports, feedback on priority settings, or requests for nominations for committees and panels. Most of the effort has been put into the core projects within the respective programmes. Also, due to limited resources, programmes rarely were able to organize regular in-person meetings with or visit trips to the NCs in their countries. Such meetings were suggested to be vital to secure good working relationship between the NCs and the programme secretariats. Furthermore, as observed by programme secretariats many committees find it difficult to communicate in English and there are currently no mechanisms in place to address this issue.

During interviews, representatives of GEC Programmes also expressed that they wished that they had resources to: implement different types of fast track initiatives and produce syntheses together with NCs; learn more about national scale activities; better link national and regional scale issues; handle inputs from NCs on research focus in a more organised manner; and engage NCs more in nominations of researchers to their own committees and to e.g. international initiatives and panels (e.g. IPCC, IPBES). Sufficient human and financial resources to engage NCs more in science/policy and capacity development projects, and to implement joint activities and more exchange between NCs, were also on the wish list. Also, in the questionnaire survey among NCs the most commonly stated limiting factor for the work of NCs was lack of dedicated funds and human resources (Fig. 3). NCs also emphasized the need for more information exchange with, and clearer directions and more networking support from, the programmes.

It was also suggested that there are no adequate mechanisms for core projects to engage constructively with national committees, and vice versa. As a result of these factors, the interaction between core projects and NCs has occurred in an *ad hoc* fashion.

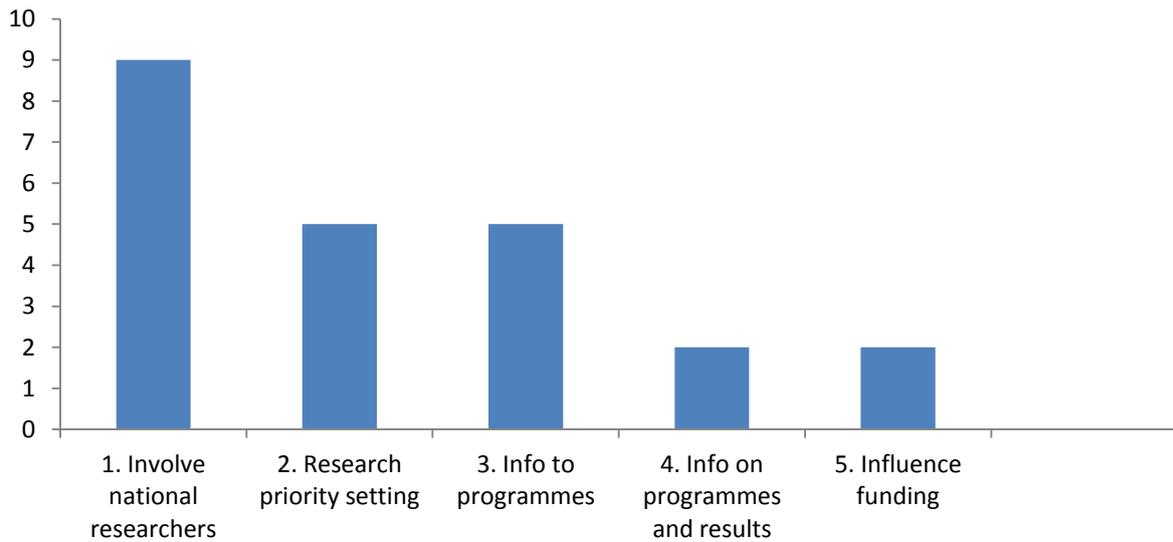


Figure 1: Number of responding National Committees (N= 23 in this question) that have ranked respective “main focus” as the highest.

Legend (answer alternatives in full text):

1. Encouraged national researchers to become involved in the program
2. Assisted the program in research priority setting
3. Provided the program with information on related research and activities in your country (e.g. through regular reports)
4. Provided advice/information based on the results of the program to policy makers/research councils/researchers
5. Assisted the program by influencing the level of relevant research funding in your country.

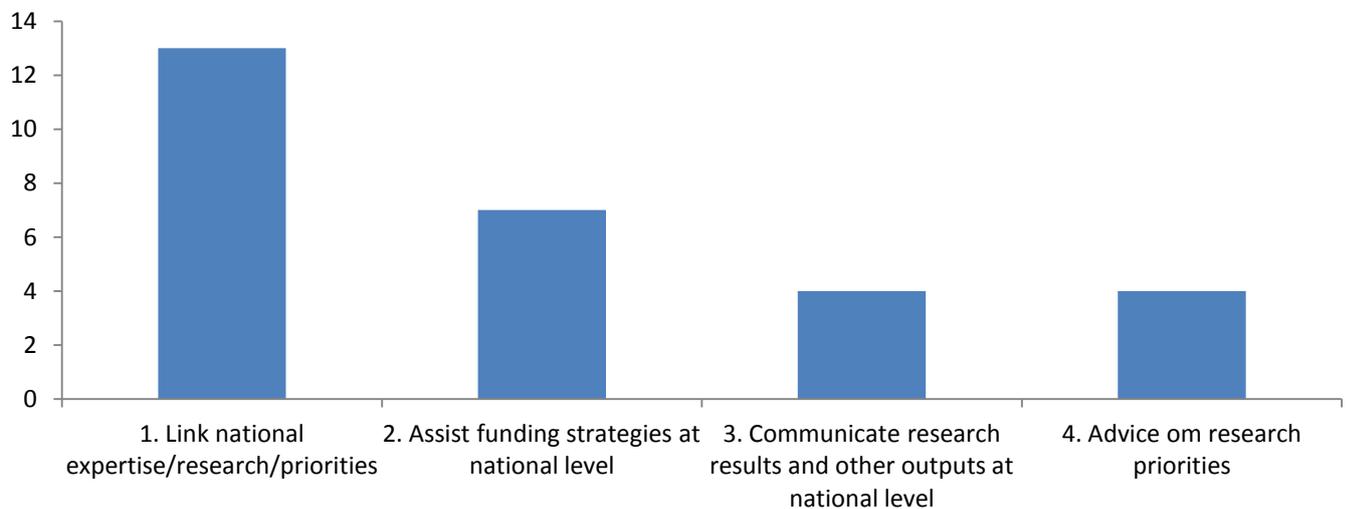


Figure 2. Number of respondents (N= 28 in this question) that have ranked respective “contribution” as the most important, upon the question “What do you consider to be most important that national committees in general can contribute to the programmes”.

Legend (answer alternatives in full text):

1. Linking national expertise/research/priorities and the programme(s)
2. Assist funding strategies at national level to support the programme’s research
3. Communicate research results and other outputs from the programme(s) at the national level (i.e. to policy makers, NGOs and other stakeholders)
4. Advice on research priorities/needs

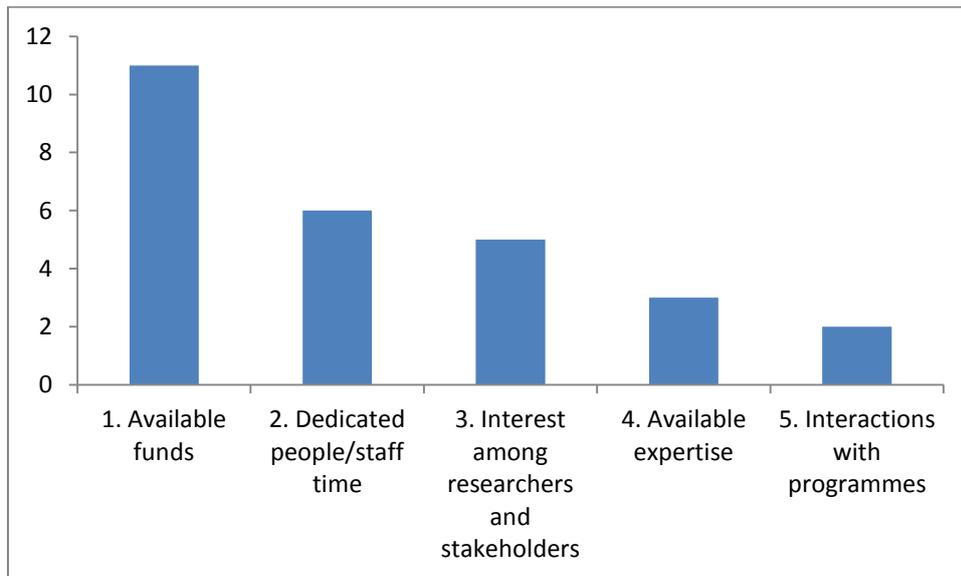


Figure 3. Number of respondents (N= 27 in this question) that have ranked respective “limiting factor for the operation of your national committee” as the most important.

In conclusion: Although they vary greatly in capacity, organisation, activity level NCs provide an essential national focus, and several NCs are well resourced and funded, and/or highly strategic and very effective at bringing together researchers and stakeholders in a country, The GEC Programmes have had limited resources to fully engage even the well-functioning NCs, and only a certain number of NCs have regularly interacted in depth with the GEC Programmes. Links to GEC core projects have also often been weak. There has also been a lack of strategic direction, guidance, as well as national funding, for establishing and running NCs.

3.1.3. Examples of NCs and equivalent organisations in operation

See Box 2 and 3 for short descriptions of the organisation and work in Germany and Switzerland.

Box 2:

German Committee Future Earth

The *German Committee Future Earth* replaced the former *German National Committee on Global Change Research* (NKGCF), a GEC committee linked to the international programs and national research funders, and established in 1996. NKGCF has been a strong supporter of integrated research in global environmental change issues, acted as a national research advisory board to national funding organisations regarding GEC issues, funding of the GEC programmes, research priorities and funding structures. To support integrated research and to further develop its organisation the members suggested to close NKGCF in 2012 and to launch a national Future Earth committee. This development has been discussed with and was strongly supported by the broader German community.

Mandated by the Deutsche Forschungsgemeinschaft (an interdisciplinary funding organisation and member of ICSU, ISSC, IGFA, Belmont Forum) in March 2013 the *German Committee Future Earth* acts as national research advisory board in questions regarding national and international activities within the new research program *Future Earth* (and the international Global Environmental Change Programs). One of the main tasks of the committee is to support the development of the scientific agenda and to assist the German community to more fully engage into the processes of co-design of research agendas and co-production of knowledge. Therefore the *German Committee Future Earth* is going to enlarge the network and to develop and to facilitate the dialogue of the German community (that included communities of different research domains and stakeholders) in several activities.

The *German Committee Future Earth* has several tools to support national activities:

- To bring together the different perspectives and to develop common goals of *Future Earth* related research the *German Committee Future Earth* organizes conferences (e.g., the “German Future Earth Summit”, 27./28.1.2014), workshops and round table discussions on specific (research) topics (and together with stakeholders).
- To inform about *Future Earth* and related activities of the international and national level a website was launched by its *Secretariat* and will be further developed to a platform to enhance and support the dialogue with the German community.
- Planned and already realized are also special networks as the German network of “Early career scientists in *Future Earth*”, where Ph.D. students, Post-Docs and Junior-Professors come together to discuss joint activities on, for instance, *Future Earth* research priorities, mentoring programs, career development etc. Also a network of the transdisciplinary research community was established to exchange news, publications and research interests

All members of the *German Committee Future Earth* work on a voluntary basis. Appointed members are scientists from different research fields. In working groups or other activities further scientists and stakeholders from different arenas are involved to work on specific topics within a specific problem definition. The committee members and all its activities are supported by a Scientific Secretariat. The staff of the *Secretariat* (1 scientific manager, 1 administrative officer) and all activities are financially supported by the *Deutsche Forschungsgemeinschaft*.

All products of the *German Committee Future Earth* (e.g. strategy papers, statements, proposals for research priorities/measures) are bottom-up produced and will be fed in strategic discussions at the national and international level (e.g. *Future Earth*, *Belmont Forum*). The national committee will play a major role in integrated science and shaping of opinions on a national level.

Box 3:

The Swiss approach

Besides the traditional disciplinary structures the Academies have established network nodes with advisory boards on strategic and cross-disciplinary topics.

The objectives of Future Earth are linked thematically to the following networks of the Swiss Academies:

- ProClim-, the Forum for Climate and Global Change, founded in 1988 (serves as a science node to WCRP, IGBP, IHDP).
- The Swiss Biodiversity Forum, founded in 1999 (served as a science node to DIVERSITAS).

Another three organizations provide networks of relevance to Future Earth:

- KFPE, the Commission for Research Partnership with Developing Countries, founded in 1994.
- td-net, the Network for Transdisciplinary Research, founded in 2003.
- ICAS, the Interacademic Commission for Alpine Studies, founded in 1999.

All these academic organizations act as a mediator between science, politics, the economic sector and the public. They are managed by at least one full time scientist and are located at the same place, the Swiss Academy of Sciences. They meet regularly and conduct joint projects. They are recognized both by the corresponding national and international science communities and by governmental agencies, policy makers and the business sector in Switzerland and draw on a broad network of researchers and stakeholders. There is thus no reason or intention to dissolve or merge them for the time being. We anticipate that all entities will engage directly with Future Earth in close collaboration with each other. A Future Earth National Advisory Board is planned to act as official contact to the international program and to foster the cohesion of the Swiss activities in the above mentioned networks.

3.2. Scope for future engagement of National Committees in Future Earth

3.2.1. Role of NCs in Future Earth

Future Earth takes on the challenge of working across global, regional and local scales, which e.g. has been pointed out by many members of the current GEC Programmes and projects as one of the weak links that need to be addressed by Future Earth. The results of the present consultation process clearly suggest that national coordination structures could facilitate this cross fertilisation for Future Earth through mobilization of national communities, communication of research priorities and research agendas, and identification of possible Future Earth partners. This could significantly contribute to the development of both Future Earth and relevant national research capacity.

The end users of the knowledge generated are often operating at national and municipal levels, in terms of both policy making and implementation, and local conditions and needs vary greatly. In addition, the success of the current and upcoming international research programs largely depends on the strength and structure of contributing national research. In turn, the quality, collaborative framework, coordination of resources, policy relevance, and trans-disciplinary character of national research is enhanced by participation in international research initiatives. Also, internationally-generated scientific data often provide an important knowledge base for national decision makers in their work in international fora. National “anchors” or two-way translators would therefore be as relevant for the Future Earth Programme as many NCs have been for the current GEC programs.

Currently, NCs and their regional alliances (e.g. European Alliance of National Committees or the broadly discussed “Future Asia”) engage researchers working on both the regional and local scale issues. As for the ongoing GEC Programmes, NCs could have an important role for Future Earth in terms of mobilization of national research communities, and communication of research priorities and research agendas. These are increasingly important functions as Future Earth specifically encourages interdisciplinary research. Existing core projects and programmes have often expressed difficulties in finding suitable candidates for scientific and steering committee membership from developing nations, and well-functioning national committees could assist with this too.

Box 4.

Stakeholder engagement in Switzerland

The Swiss academic networks mentioned in Box 3 will mainly communicate topics and facts to stakeholders in industry, politics and governments, rather than explaining organizational research structures such as IGBP, IHDP, WCRP and DIVERSITAS or the new programme “Future Earth”. On the other hand, the importance of ‘Future Earth’ has been communicated to the science community and to the funding structures. Future Earth will appeal to the science community as soon as it provides attractive research opportunities.

Up to now the Swiss organizations mentioned in Box 3 have encouraged Swiss scientists to become involved and engage in the international programmes, but relied on the scientists to do the agenda setting.

The engagement with stakeholders is described on three examples for the case of ProClim: Ex1: ProClim- has organized 63 **parliamentary meetings** throughout the last 18 years to which all members of the parliament and the directors of the federal agencies are invited. A specific topic is usually discussed from the viewpoint of a scientist and an expert from the private sector. The short statements are followed by an open and generally very lively discussion. Ex2: In collaboration with federal agencies or stakeholders ProClim- organizes **round tables** on topics where stakeholders seek scientific expertise. The resulting products are jointly written fact sheets, reports or merely protocols and may lead to joint projects. Ex3: ProClim- runs the secretariat of the **federal advisory body on climate change (Occc)** and prepares **Swiss synthesis reports**, which serve as a basis for recommendations made by the Occc.

About half the funding of ProClim- stems from external sources, mainly federal offices (e.g. Environment, Meteorology) and to a small part from the private sector (insurance). These engagements guarantee a tight interactions with the different stakeholders.

Connection of NCs to local, national and regional stakeholders brings up another important possible role of NCs within Future Earth. As Future Earth gives co-design of research agendas and co-production of knowledge a prominent role in its strategic plan, NCs could also link solution-oriented research projects to national and regional-level stakeholders that the programmes'/projects' researchers often are not familiar with, as well as facilitate co-design of research agendas on a national and regional level, in collaboration with other NCs when needed. See examples of related activities conducted in Switzerland and by the German Future Earth Committee in Boxes 4 and 5.

The future role of NCs was also discussed at The National Global Change Research Committees Meeting held in London, March 30th 2014. The meeting was organised by the European Alliance but had a global focus. The main objectives were to share experiences on the current role and function of NCs, how they can stimulate GEC research in their respective countries, and how they can deliver and fertilise GEC science at the international level, as well as to discuss the changing global GEC landscape and the role of NCs in Future Earth. The meeting was attended by around 60 people representing more than 30 IGBP, DIVERSITAS, and IHDP NCs. It was concluded by the participants that NCs would be the natural brokers at national level to facilitate the transition to and implementation of Future Earth. A particular concern expressed at the meeting was how the Future Earth infrastructure would be funded and/or what the financial expectations (e.g. subscription model, non-subscription model) of NCs were. A written statement was subsequently submitted to the Future Earth Transition Team by the meeting organisers on behalf of the participants (Annex 2).

In 2012, the Swiss organisation ProClim and the Swedish National Committee for GEC were invited by IGBP to provide their views on the potential roles of NCs in Future Earth. The responses are provided in Annexes 3 and 4. As a result of these and other consultations in the preparation of Future Earth's *Future Earth Initial Design Report, 2013 (1)* recognizes that the GEC NCs can play a key role in implementing Future Earth science at the national level.

In conclusion, NCs can be the the natural “brokers” at national level to facilitate the transition to and implementation of Future Earth by increasing Future Earth’s visibility, communicate Future Earth priorities, facilitating Future Earth dialogues, and identifying possible stakeholder, research and funding interfaces on a national level.

Box 5.

Stakeholder Engagement by German Committee Future Earth

As stakeholders from industry, politics and society are mainly interested to work in specific thematic areas, the German Committee Future Earth has decided to involve stakeholders in all thematic activities (e.g. workshops, round table discussions, conferences, working groups). As one example of the stakeholder engagement strategy the German Committee Future Earth started in 2014 an overarching process to mobilize the German community and to develop the German perspective of co-designed Future Earth research priorities. For this several steps will be taken:

- **Informal meetings** are organised together with scientists, possible stakeholders, German SC/SSC members of GEC programs (e.g. scientific committee members), research funders and academies.
- **Mobilizing the broader scientific community to discuss research interests:** the “German Future Earth Summit” was a successful networking conference where we have invited scientists from different fields but also representatives from industry, federal ministries, research managers, directors of research organisations and research funders to share their opinions on Future Earth research (January 2014).
- **Developing a set of research priorities:** on the basis of the results of the German Future Earth Summit, the international grand challenges, and the results of the GEC Programmes a set of overarching research questions will be developed together with a small group of high level scientists and stakeholders (June 2014).
- **Supporting the self-organisation of the community:** to further develop integrated research topics, processes and structures in the context of Future Earth, the members of the German Committee Future Earth will suggest a possible self-organizing process and how the committee could support the activities of the community (fall 2014).
- **Involving broad but also topic specific stakeholder groups:** high level meetings will be organized to discuss research priorities as well as working groups will be organised to discuss specific research topics in more detail (planned for 2015).
- **Bringing together the communities regularly:** 2nd German Future Earth Summit (planned for 2016).

3.2.2. Potential tasks of NCs

Zooming in on more specific tasks of NCs, they could, depending on capacity in each case, support Future Earth's and its core projects' capacity development activities and international meetings, assist in other logistic arrangements, identify potential research partners, and organize stakeholder/co-design meetings around either the overall Future Earth agenda or specific research areas. This would naturally also stimulate and fertilise GEC research in the respective country (See Box 6 for a couple of examples from Sweden). The Global Change Programmes reportedly have good experience with several of their NCs in this regard.

Depending on resources and mandate, NCs could also seek to stimulate funding agencies in their respective countries to support research and projects that are relevant or directly linked to Future Earth and thereby assist to diversify sources of funding. NCs could also play a role for funding at international level for Future Earth, by, for example, increase and broaden the national engagement in organisations, such as the Belmont Forum, and thereby strengthen their collaboration with Future Earth, through for example Belmont Forum's research support programme "Collaborative Research Actions" (2). In the Swedish case, for example, SSEESS, which is representing and influenced by the Swedish NC, is actively participating in IGFA/Belmont Forum's efforts to establish an international funding strategy for Future Earth.

Box 6.

Examples of integration of Swedish researchers in GEC programmes

The Swedish National Committee for Global Environment Environmental Change (Swedish NC) is under the auspices of the Royal Swedish Academy of Sciences, and was established during 2012. It functions as the NC for all the current ICSU Global Environmental Change (GEC) programmes, including Future Earth. The NC has administrative and financial support from, and is represented by SSEESS. This role falls well within the goals of SSEESS, as one of SSEESS goals is to enhance the integration of Swedish GEC research with international GEC programs, with a particular focus on ICSU and ISSC. SSEESS is also responsible for the Swedish member fees to IHDP and DIVERSITAS.

Below are two examples of specific activities conducted by SSEESS to seek to link Swedish researchers to the Core Projects of the GEC programmes.

- SSEESS provides the "Swedish GEC Science Gateway", where Swedish researchers can sign up and express their interest in participating in GEC related international research programs, working groups and panels. The idea is to build up a pool of researchers who already have an explicit interest in international engagement and in advance have specified their expertise and area of interest to more efficiently match Swedish researchers with the needs at international level. Members can also apply for travel support from SSEESS.
- SSEESS runs a series of "Thematic Workshops", organized in Sweden together with core projects of the ICSU GEC programs. The workshops gather Swedish scientists to explore, discuss, and make analytical contributions within the research framework of the GEC programmes and actively stimulate and facilitate the involvement of individual Swedish researchers in the activities and research of these programmes. It could also lead the formation of new Swedish projects, networks and groups addressing GEC related research questions that are part of the agendas of the GEC programmes. SSEESS also provides planning grants for further development of any project ideas.

3.3. Organisation of national committees for Future Earth at the national level

To fulfil their purpose, the NCs that are sufficiently resourced would need to accurately and with strong dedication manage and communicate the opportunities offered by Future Earth for research, decision support, and stakeholder engagement in their respective countries and international arenas. To match this, and the potential roles described above, NCs would need to operate beyond the committee structure by building and administrating, or closely liaise with, dynamic national networks gathering researchers, business, and civil society sectors in an efficient and transparent manner. NCs that currently do not have the full capacity to engage at this level should aim to develop in this direction.

During the discussions in this consultative process, it was mentioned that there may even be reason to abandon the notion of NCs, as they might be too limited, and move towards a more inclusive “Future Earth National Network Structure”. The organisational structure of the UN Sustainable Development Solutions Network, with National Centers at relevant institutions that coordinate national networks and activities, was brought up as an example of an alternative way of organising Future Earth at national level (3). If alternatives to NCs are considered, the fact that many current NCs are under the auspices of national Academies, which in turn are national members of ICSU, needs to be taken into due consideration.

One option to create strategic relationships and roles for NCs presented during the discussions was the development of a “Future Earth Fellows programme”. A Future Earth Fellows programme would involve the appointment for fixed terms (e.g. three years) of Future Earth Fellows from across the globe. Each NCs could appoint say 20 fellows per country: ten from research, two from industry, two from policy, two from media and two from society. These fellows would meet regularly at a national level, promote the work of Future Earth acting as ambassadors, and develop national research or science-policy initiatives. All fellows would also meet regularly internationally with the aim of producing strong transdisciplinary communities and building capacity globally.

The productivity and efficiency of a NC do, naturally, not only depend on its own structure, dedication, and capacity. Future Earth would need to develop an effective plan for collaboration with NCs that provides strategic direction, including clear overall science and implementation plans for delivering Future Earth, and conversely allows NCs a greater say in the direction of Future Earth. In the survey, several of the NCs highlighted the need for a clear communication strategy from Future Earth’s side. The benefits that a country and its participating institutions derive from maintaining an active and engaged NC also need to be clear and have to be regularly emphasised.

Future Earth should provide clear guidelines for establishment of NCs in order to facilitate transparency and quality-assurance in the bottom-up formation of NCs. During the discussions, it was also brought up that the NCs should be institutionalised (institution-bound) Future Earth nodes in the countries. They could be initiated spontaneously or as a

response to a Future Earth call. The latter would give the Future Earth Secretariat more control over the representation and stability of the NCs, although, the national institutions, which most often will fund the NCs, would have the uttermost influence on operations and appointment of NC members. Notably, there may be more than one group or organisations that are interested in forming Future Earth NCs in a country, and Future Earth would in either case need to be closely involved and/or well informed in the process of establishing NCs.

Table 1. Status of the formation of national Future Earth Committees or equivalent to the knowledge of the project team.

ESTABLISHED FUTURE EARTH COMMITTEES (IN BOLD) AND EQUIVALENT COMMITTEES		PLANNED/NEGOTIATED FUTURE EARTH COMMITTEES
Austria	National Committee for Global Change, Austrian Academy of Sciences	Australia
China	Chinese National Committee for Future Earth , sponsored by China Association for Science and Technology	France
Denmark	National Committee for Global Change, Royal Academy of Sciences	Ireland
Finland	Future Earth Finland , Council of Finnish Academies	Mozambique
Germany	German Committee Future Earth , German Research Foundation	Morocco
Japan	National Committee for Future Earth, Japan , Science Council of Japan	Norway
Spain	Spanish Future Earth National Committee , Center for Advanced Studies of Blanes, Spanish Research Council.	Indonesia
Sweden	Swedish National Committee for Global Environmental Change , Royal Swedish Academy of Sciences	Portugal
Switzerland	Function is in place through ProClim, and there are plans for a dedicated Future Earth Committee.	Romania (in place by the end of 2014)
Tanzania	National Committee at Institute for Environment and Development Studies	Taiwan (in place by the end of 2014)
		UK (potentially together with Ireland)
		USA (ongoing discussions)

NCs could be given specific responsibilities relating to engagement with national funders and stakeholders and develop the Future Earth network nationally. Future Earth would need to clearly specify its expectations on the committees on a regular basis, especially in conjunction with particular events or developments within the program, such as when research priority settings are to be made or when certain capacities are requested. NCs should also be better integrated with the core projects of Future Earth. This would increase project engagement and impact at the national level. The European Alliance of National

Global Change Research Committees (EA) has taken on this issue and currently runs an iLEAPS-EA pilot activity. During interviews with the GEC Programmes, one person suggested that for each core project, a contact person be appointed within the global network of NCs. This contact person could work closely with the project IPO and with the regional nodes of the project.

Based on the responses to the questionnaire, a number of countries are preparing for or already have established a national representation to Future Earth, mainly through NCs. Based on the questionnaire survey and other sources (e.g. EA) the project team estimates that currently at least 21 countries already plan to have national Future Earth NCs (13 European, four Asian, three African, and one North American countries, Table 1). In 10 of these countries, Future Earth is already included in the work of preexisting NCs or in newly established Future Earth Committees. For example, the Future Earth committee that recently was set up in China is currently seeking national funding for a number of already identified Future Earth related research priorities.

The project team also discussed the level of integration of NCs in the formal structure of Future Earth. It has been suggested earlier, i.e. in the *Future Earth Initial Design Report, 2013* (1), that NCs should be formal and integral parts of Future Earth. Although this would secure and strengthen the role and representation of NCs in Future Earth, it would require more specified rights and responsibilities of NCs and a more formalised relationship/agreement between NCs and other parts of Future Earth (e.g. the Future Earth Global Secretariat). This can collide with the interest of maintaining a strong national ownership of NCs in terms of for example their priorities, standpoints, mandate, roles, and organisation. Therefore Future Earth will need to consider different pathways for NCs to emerge and operate that differ in terms of the degree of structural integration and shared strategy between the NC and the globally distributed secretariat of Future Earth.

In conclusion; National Future Earth Committees (NCs) should be formed according to each country's needs, interests and capacity. At the same time, Future Earth should be involved, or at a minimum well informed, on the development of NCs. Future Earth needs to make strategic decisions in terms of the degree of formal integration of NCs in Future Earth, as a more formal relationship may include certain requirements from both Future Earth and NCs. NC should have a broader representation of stakeholders and a more flexible national network attached than most NCs have today, catering to both interdisciplinarity and transdisciplinarity. Future Earth needs to provide clear strategic guidance to and develop a coherent communication strategy in relation to NCs, and be able to provide support to NCs to varying degrees. National Committees for Future Earth are already in place or planned in several countries

3.4. A global network of National Committees; Added value and organisation

According to the consulted parties, it would be of major interest to efficiently connect the NCs with each other on a global level; to bring together the different views and challenges of NCs; to learn from each other about concerns, research interests (e.g. of developing countries) and methods; to identify scale and degree of generality of environmental challenges, as well as to find common goals and effectively communicate Future Earth. It seems clear that both NCs and GEC Programmes see a number of benefits derived from collaboration between NCs. The opportunity to share experiences and expertise, and to identify and take joint positions on common research priorities all seem equally important to NC according to the questionnaire survey. About half of the responding NCs have previously collaborated with an NC in another country.

According to most interviews and questionnaire responses, some form of sub-global organisation of NCs seems necessary to practically manage deeper collaboration among NCs, and thereby more efficiently strengthen the representation of national and local research challenges by identifying common priorities across national borders. NCs could be organized by geographic regions, geopolitical regions (EU, ASEAN etc.), or by clusters based on common GEC challenges and research priorities, which in turn could be dynamic over time. (For the latter, the global network could be facilitated through an online digital platform. It was also mentioned that, as in the lifetime of Future Earth global connectivity is set to grow significantly, Future Earth should capitalise on this to create a dynamic and adaptable network in the forefront of technology development.)

A couple of times during interviews with GEC Programmes concerns were raised, and one of the persons interviewed showed strong skepticism, towards regional organisation of NCs, mainly based on the risks of adding a layer of bureaucracy to an already relatively complex structure.

Twenty-six out of the 28 representatives of NCs that responded to this part of the questionnaire preferred some kind of sub-global organisation of NCs. Fifteen of them preferred an organisation based on geographical regions, while five preferred to be organised according to geopolitical regions and six representatives ticked “by prioritised research areas” as their preferred alternative. At the same time, it was pointed out that there needs to be due flexibility in the organisation according to specific problems and research areas. Several representatives of NCs in the survey highlighted the European Alliance for National GEC Research Committees (EA) as a good example of regional organisation.

At the Future Earth Regional Workshop for Europe held in Paris, 13-14 May 2013, it was suggested that a European node for Future Earth could have an important function in various arenas, such as;

- the integration and dissemination of knowledge
- identification and possibly also coordination of funding opportunities
- supporting research an institutional capacity building
- engaging regional stakeholders in dialogues and co-design of research activities,

- acting as an incubator of new projects
- building interfaces with other regions

The same reasoning could be applied to justify regional organisation of NCs, which could subsequently even fill this purpose provided that the NCs are well functioning and take active part in the work of the regional node. It was concluded by the project team, however, that regional nodes of NCs should be closely associated with, or could even in some cases be a part of, the Regional Hubs of the global secretariat, due to the potentially great overlaps of objectives and activities between these.

The *Future Earth Initial Design Report* (1) concurrently suggested that the NCs integrate their activities into regional networks such as the European Alliance of Global Change Research Committees. Furthermore, DIVERSITAS describes its work on a regional level as follows on their website (4).

“Many issues related to biodiversity transcend national boundaries. Therefore, it is often vitally important for several countries to collaborate in scientific research and in policy development. The knowledge and experience gained through such integrative approaches is invaluable across the DIVERSITAS network. In addition to its strong collaboration with the Asia-Pacific Network for global change research (APN) and the Inter-American Institute for global change research (IAI), DIVERSITAS collaborates with these two regional committees:

- [DIWPA: DIVERSITAS in the Western Pacific and Asia](#)
- [European Alliance of Global Change Research Committees”](#)

While NCs could team up in a flexible and opportunistic way based on common research efforts and sharing of expertise, concurrently operating regional nodes could allow for more long-term capacity building, institutional learning, and sharing of resources. It should also be noted that many countries currently do not have the potential for establishing NCs. Members of NCs in e.g. Africa have stressed the potential need for regional committees that could include and provide a platform for individual representatives from these countries. Also, many knowledge needs are region-specific. The EA, mentioned above and under the leadership of Finland, currently adjusts its focus to reflect the stakeholders’ needs and has started several projects to, for example, share products that can be used for policy dialogues in different countries.

While capacity sharing would increase the effectiveness of all members in a regional node, it would obviously be of particular importance for the NCs that have the least resources and facilitate their representation in Future Earth. A common pool of funds could also be established at regional level and experienced and well resourced NCs could, in a structured way, be paired up with less developed NCs, to increase the efficiency of capacity building. Funding could also be provided annually at a global level to seek to close the “North-South divide”.

In conclusion: A global network, including its regional nodes, can facilitate the sharing of expertise, experiences, and best practices for dialogue with stakeholders, identify and take joint positions on common research priorities, integrate and disseminate knowledge,

promote multi-national GEC research, identify and possibly coordinate funding opportunities, and support research and institutional capacity building. Regional nodes could also engage regional stakeholders in dialogues and co-design of research activities, and facilitate interaction between core projects and NCs.

4. Conclusions and recommendations

National Committees (NCs) have in a number of cases made important scientific, communicative, administrative and financial contributions to the work of the GEC Programmes and thereby have a proven potential. Well functioning NCs and resourced networks of NCs can help Future Earth achieve its vision. In summary, the identified strengths and weaknesses of NCs, as well as the opportunities they offer, are the following:

Strengths

- Several NCs are well resourced and funded, and/or highly strategic and very effective at bringing together researchers and stakeholders in a country.
- NCs provide an essential national focus for the GEC Programmes for example by organizing workshops and symposia around GEC themes.
- Some national funding of GEC Programmes has correlated with the establishment of NCs.
- Some NCs provide direct links into national policy and funding agencies.

Weaknesses

- The GEC programmes have had limited resources to fully engage even the well-functioning NCs.
- The capacity, organisation, activity level, and potentials have varied greatly among NCs and their networks in the past.
- There has been a lack of strategic directions from the GEC Programmes for establishing and running NCs.
- Only a certain number of NCs have regularly interacted in depth with the GEC Programmes.
- They often do not operate as a network in a country, i.e. committee members are often the only representatives in a country.
- Links to GEC projects are often weak.

Opportunities

National Committees

- Increase Future Earth's visibility.
- Communicate Future Earth priorities.
- Facilitate Future Earth dialogues.
- Identify possible interfaces on a national level.
- Identify and assess Future Earth-relevant research and stakeholder activities within the respective countries and link them to Future Earth.
- Collaborate with national research communities and stakeholders to identify challenges and research priorities as a basis for advice to and influence on Future Earth activities.
- Organise workshops, training, and conferences on integrated science and communicate the outcomes to the global level.
- Assess national research funding schemes and priorities of funders in relation to Future Earth priorities, liaise with national funding agencies, and facilitate funding of Future Earth, core projects, and national Future Earth-relevant research.

(See also the main objectives of NCs recommended in the Future Earth Initial Design Report 2013 (1))

Network of committees regionally and globally

A well-coordinated global network and/or regional nodes of NCs could:

- build vibrant, engaged communities of researchers and stakeholders around the Future Earth vision.
- share experiences and expertise on specific global and regional problems.
- identify and take joint positions on common research priorities.
- integrate and disseminate knowledge, promote multi-national GEC research.
- offer/coordinate expert opinion on policy and practice.
- identify and possibly coordinate funding opportunities, and support research and institutional capacity building.
- engage regional stakeholders in dialogues and co-design of research activities.
- The interaction between core projects and NCs could also be facilitated at the regional level (as the European Alliance of National Global Change Research Committees is currently doing at a pilot scale).

Recommendations

Assuming that the strategic and organisational structure of Future Earth anticipates active participation of NCs on a global scale, the findings of the consultative process prompt the following recommendations. These recommendations show two different pathways for NCs to emerge and operate that differ in terms of the degree of integration and shared strategy between the NC and the globally distributed secretariat of Future Earth – either with global or regional hubs. *(The recommendations are not necessarily based on consensus, but rather aim to reflect the median view of the project team)*

OPERATION AND COORDINATION OF NATIONAL COMMITTEES FOR FUTURE EARTH

Main approach 1

National committees and regional nodes as integral and formalised parts of the Future Earth structure/network
Referred to as “1” below

Main approach 2

Highly independent national committees, and a self organised network of national committees.
Referred to as “2” below

1+2

National Future Earth Committees (NCs) should be formed with a bottom-up approach according to each country’s needs, interests and capacity. This also means that diversity among NCs in terms of main foci, institutional set up, and activity level will need to be accepted. These differences can also enrich Future Earth.

1+2

NCs could either be organised through and/or according to the existing type of NCs or be set up through a more pragmatic enrolment of key academic institutions in the respective countries (in dialogue with formal national Future Earth-relevant organisations). However, NC should have a broader representation of stakeholders and a more flexible national network attached (potentially including a Future Earth Fellowship Programme*) than most NCs have today, catering to both interdisciplinarity and transdisciplinarity. NCs should be seen as committees/boards for national Future Earth networks.

1. NCs and a global network of NCs should be an integral and formalised part of the Future Earth network/structure.

1. NCs can be organised in regional nodes, but should be assisted to collaborate cross regional based on prioritised research areas. Regional NC alliances could also function as “regional committees” gathering representatives from countries that currently do not have the resources or interest to form NCs. NCs should still have unrestricted possibilities to collaborate directly with the global secretariat when necessary. “Regional hubs” The NC regional nodes should be compatible with or closely related to the regional hubs of the Future Earth Secretariat

2. NCs can organise themselves in regional alliances, but be free to collaborate across regions based on prioritised research areas. Regional NC alliances could function as “regional committees” gathering representatives from countries that currently do not have the resources or interest to form NCs. NCs should still have unrestricted possibilities to collaborate directly with the global secretariat when necessary and when there is mutual interest for this. The NC regional nodes should strive to be as compatible with or closely related to the regional hubs of the Future Earth Secretariat as possible.

1. NCs need to have clear incentives of and a guiding document (or a Memorandum of Understanding between the NC and Future Earth), including minimum requirements, for becoming NCs for Future Earth, as well as continuous strategic guidance, directions, and support relating to engagement with national funders and stakeholders and develop the Future Earth network nationally.

2. NCs need to have clear incentives of and a guiding document (that could be developed in collaboration with existing NCs), including minimum requirements, for becoming NCs for Future Earth, as well as continuous strategic guidance, including specific support relating to engagement with national funders and stakeholders and develop the Future Earth network nationally where the capacity of NCs and Future Earth allows.

1. The NCs should be involved in the scientific (strategic) activities and stakeholder dialogues in collaboration with the e.g. the Future Earth Science Committee, Engagement Committee, Core Projects or regional hubs.

2. NCs should be considered for direct involvement in the scientific (strategic) activities and stakeholder dialogues in collaboration with e.g. the Future Earth Science Committee, Engagement Committee, Core Projects or regional hubs, in a pragmatic case specific, manner.

1+2

To establish and maintain a proper national representation and support, Future Earth will need to have an efficient communication strategy that, while maintaining a uniform overall approach, can be used, reproduced, and adapted according to specific needs in the different

countries and regions. Tools, particularly web tools, should be developed to encourage networking.

1+2

Dedicated financial and human resources would be needed for operating the global network.

1+2

There should also be funds for individual NCs to apply for, primarily to support the work of NCs that have the least resources as to facilitate their participation in Future Earth, but also to be able to support specific projects proposed by any NC.

STEPS FOR ESTABLISHING THE GLOBAL NETWORK OF NCs

Main approach 1

National committees and regional nodes as integral and formalised parts of the Future Earth structure/network
Referred to as "1" below

Main approach 2

Highly independent national committees, and a self organised network of national committees.
Referred to as "2" below

1+2

A clear strategic plan for including NCs in the operational structure of Future Earth at national, regional, and global levels should be developed. Guidance documents for both NCs and regional NC nodes, based on the conclusions and recommendations above, should be prepared.

1. Existing NCs for Future Earth (or equivalent) in both the developed and developing parts of the world should be identified and invited to officially (or formally) enroll in Future Earth. The 8-10 most active, well organised and/or relevant NCs based on the guidance document should then become the focus of initial deeper engagement and interaction rather than striving for an active global network right at the outset. This should be done through a structured notification and review process by the Future Earth
2. Existing NCs for Future Earth (or equivalent) in both the developed and developing parts of the world should be identified and invited to officially enroll in Future Earth. The 8-10 most active, well organised and/or relevant NCs based on the guidance document, as well as on the priorities and capacity of the Future Earth secretariat, should then become the focus of initial deeper engagement and interaction with the Future Earth Secretariat rather than striving for an active global network right at the outset.

secretariat, in consultation with external people that have hands on experience of working with NCs (e.g. from the current and past GEC Programmes).

1+2

In countries that do not have established Future Earth committees (or equivalent) invitations, or calls for applications if the interest is high in a country, to form Future Earth committees should subsequently be made in collaboration with relevant national institutions. For countries that still have active committees for individual GEC Programmes these existing committees should be actively and directly approached through existing channels. In cases where committees for several GEC Programmes are currently gathered under the same institution (e.g. an academy), these should be involved in a close dialogue during this process.

- 1.** Subsequently and where not in satisfactory operation yet, regional nodes of NCs should be formed through a structured application and review process under the auspices of the Future Earth Secretariat.

1+2

Dedicated financial and human resources should be allocated or raised at an early stage by the Future Earth secretariat for setting up and coordinate the global network of NCs, and the regional nodes if the network is organized this way.

*In the discussions the option of developing networks of Future Earth Fellows was brought up. A Future Earth Fellows initiative would involve the appointment for fixed terms (e.g. three years) of Future Earth Fellows from across the globe. Each national committee could appoint 10-20 fellows per country, representing research, industry, policy, media and other parts of society. These fellows would meet regularly at a national level, promote the work of Future Earth acting as ambassadors, and develop national research or science-policy initiatives. All fellows would also meet regularly internationally with the aim of producing strong transdisciplinary communities and building capacity globally.

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