



Second GECAFS Scientific Advisory Committee Meeting

Protea Waterfront Hotel, Centurion, South Africa

Saturday 12 April 2003

09:00 – 17:30

Agenda and Background Papers

Principal Objectives of the 2nd SAC meeting

- Receive Report of GECAFS development to date including current plans
- Advise on plans in the light of Reports
- Identify areas of new science and scientific priorities for 2003-04
- Consider SAC membership contacts with developing research portfolio

Agenda

Item 1: Welcome and Apologies – *Peter Gregory* **No paper**

Item 2: Minutes of the 1st GECAFS SAC meeting (Trinidad, 24 April 2002) – *Peter Gregory*

Item 3: Matters Arising – *Peter Gregory*

10:30 Coffee

Item 4: Receive Report on Research Priorities set at the 2002 SAC meeting – *John Ingram*

Item 5: Receive Reports of feedback from 2003 IGBP SC, IHDP SC and WCRP JSC – *John Ingram, Mike Brklacich, (Doug Whelpdale)*

Item 6: Receive Project reports

1. GEC and the Food Systems of the Indo-Gangetic Plain– *Pramod Aggarwal*
2. Caribbean Food Systems Project – *Adrian Trotman*
3. Vulnerability Science Update – *Stuart Franklin*

13:00 Lunch

Item 7: Review Future Project plans

1. Southern Africa **No paper**
2. Eastern Pacific Fisheries: Initial Concepts – *Dagoberto Arcos*
3. GECAFS Comprehensive Scenarios – *Mike Brklacich/(Doug Whelpdale)*
4. Criteria for GECAFS priority geographic regions and topics

Item 8: Determine Priorities for 2003-04 – *Peter Gregory*

16:00 Coffee

Item 9: SAC membership – *Peter Gregory*

1. Review Membership
2. Decide Project Contact Points

Item 10: Confirmed and Potential GECAFS Awards

Item 11: Any Other Business **No paper**

Item 12: Date and Venue of Next Meeting **No paper**

17:30 Close

Item 2: Minutes from the 1st GECAFS SAC Meeting

GECAFS Scientific Advisory Committee Inaugural Meeting
Kapok Hotel, Trinidad
Wednesday 24 April 2002

MINUTES

Present:

Peter Gregory, University of Reading, UK (*Chair*)
Mike Brklacich, Carleton University, Canada (*Vice-Chair*)
John Ingram, GECAFS IPO, NERC-Centre for Ecology and Hydrology, UK (*Secretary*)
Barbara Huddleston, FAO representative
Anne-Marie Izac, CGIAR representative
Jim Jones, University of Florida, USA
Ray Motha, WMO representative
Hector Peña, INPESCA, Chile (*Observer, on behalf of Dagoberto Arcos*)
Mahendra Shah, IIASA, Austria
Bill Sugrue, USAID, USA
Maarit Thiem, IHDP Secretariat, University of Bonn, Germany (*IHDP Secretariat Observer*)
Luis Vieira, EMBRAPA, Brazil
Doug Whelpdale, Meteorological Service of Canada (*WCRP Observer*)

Item 1: Welcome, Round of Introductions and Apologies

Peter Gregory welcomed participants and invited a round of introductions. Apologies were noted from:

Dagoberto Arcos, Fishery Research Institute, Chile
Oran Hesterman, WK Kellogg Foundation, USA
Linda Mearns, NCAR, USA
Mohamed Salih, Institute of Social Studies, The Netherlands (*IHDP Observer*)

The aim of filling SAC vacancies over the next 1-2 years was noted.

Item 2: GECAFS Scientific Advisory Committee Terms of Reference and Committee Inauguration

The SAC noted the Terms of Reference. It was agreed to modify the second, and add a fourth role:

1. *Oversee the development of an active science programme.*
2. *Receive reports from GECAFS individual projects and integrative studies **and offer advice for furtherance of the projects and studies.***
3. *Prioritise activities of the science programme.*
4. *Assist in the dissemination of key GECAFS results.*

ACTION: John Ingram to modify GECAFS Reporting and Management diagram to reflect changes in Terms of Reference (see attached).
The GECAFS Scientific Advisory Committee was inaugurated.

Item 3: GECAFS developments since inauguration in July 2001 and current plans (including IPO funding status and plans)

Peter Gregory reported that the IGBP, IHDP and WCRP Chairs and Directors had formalised GECAFS in July 2001, and that implementation had commenced on 1 January 2002 with the establishment of the IPO in Wallingford UK.

The SAC noted (i) the report of actions taken and progress made since July 2001 (see meeting background papers p. 9); and (ii) GECAFS current plans and the proposed initial projects and meetings strategy (see meeting background papers p. 10).

The issue of vulnerability rather than long-term climate change was noted as an “entry point” for GECAFS collaboration for many potential partners (notably FAO). The links between vulnerability and short term changes in climate variability is important. This will also help identify the potential links with GEF and other assessment and research bodies (e.g. MA and CGIAR, respectively).

The overall IPO budget should be developed in relation to overall research costs. A figure for “administration” of more than 20% would be hard to justify. This is essentially an issue of presentation.

ACTION: John Ingram to modify overall budget as appropriate.

Item 4: Indo-Gangetic Plain Food System project planning developments

The SAC noted the report of actions taken and progress made (see meeting background papers pp. 12-15).

Discussions noted that:

- (i) the IGP Consultancy needs to be developed to deliver more than just a “paper”
- (ii) the IGP Consultancy needs to incorporate a preliminary discussion of livelihoods in relation to current (and future/GEC) environmental conditions.
- (iii) more interaction with NGOs should be established
- (iv) FAO can help with identifying more contacts in the regions (the FAO FIVIMS approach could be used to help develop interregional projects)
- (v) advice from Peter Matlon (Rockefeller Foundation) should be sought regarding the policy dimension.

ACTION: John Ingram to (i) contact IGP Consultants; (ii) incorporate links to FIVIMS in FAO “agreement”; (iii) contact Peter Matlon.

Item 5: Feedback from IGBP and IHDP SCs and WCRP JSC, and Draft Prospectus

The SAC noted the reports of presentations to the IGBP and IHDP SCs and WCRP JSC (see meeting background papers pp. 16-19). Points of discussion were:

IHDP: GECAFS is well received by IHDP SC, while noting the need to position GECAFS in relation to vulnerability.

WCRP: The possibility of commercial sponsorship needs very careful consideration (see WCRP point 2, in meeting background papers p.18). A policy considering ethical, intellectual property rights and other moral and legal issues needs to be set by the Sponsoring Programmes.

IGBP: Following the feedback from the IGBP SC presentation it was agreed that only GECAFS representatives closely involved in the project should give reports. Reports should make clear the way in which GECAFS has been designed (i.e. in response to the “Guiding Principles”).

The need to confirm the reporting line to Chairs and Directors (as agreed when GECAFS was established) was noted.

The progress on the Prospectus was noted.

ACTION: SAC to send comments on draft Prospectus to John Ingram by 24 May.

Item 6: Development of GECAFS science programme

The SAC noted the main features of the GECAFS science programme (see meeting background papers p. 20).

Discussion noted the need to:

- (i) deliver a tangible products by the end of 2002:
 - a. IGP consultation paper
 - b. ICSU-WSSD paper (cf 9.1 below)
 - c. GECAFS Prospectus
 - d. Scoping activity to identify “hotspot” regions.
- (ii) develop a database of existing, relevant research which could be brought together within the GECAFS framework
- (iii) extract and interpret findings of existing work in a GECAFS context
- (iv) find a “simple” example(s) to demonstrate GECAFS in practice
- (v) develop a clear articulation of the types of research questions GECAFS can address
- (vi) develop a framework to bring science and policy together.

Caribbean project

This should be developed in liaison with FAO-Santiago and CARICOM. The SAC noted that several up-and-coming younger scientists had actively participated in the Caribbean meeting, and that their involvement needs to be promoted when developing the project.

Pacific fisheries

The SAC noted a more general discussion on food provision systems based on coastal fisheries is needed before selecting a particular region. FAO could assist with contacts for a meeting.

Sub-Saharan Africa

The SAC noted the need to develop a GECAFS project in SSA. A point of contact could be the “African Agricultural Research Grouping” (of NARS) and UNEP could advise on contacts with the African Ministers of Environment. A “Special Initiative of Africa” will be tabled at WSSD and a GECAFS analysis of where GEC will have most impact would be a valuable addition (see 9.1 below). SADDCC would be the appropriate “point of entry” for southern Africa.

The need to consider how GEC will affect the world’s major food supply regions was also noted.

Item 7: Discuss priority geographic regions and topics

Given the wide range of possible regions/topics for GECAFS projects, criteria need to be established which help with prioritisation. (Criteria for what should be included within an *individual* project have already been established.)

Possible selection criteria include:

- Range of GEC “issues” (e.g. water availability, El Niño, land management, etc.)
- Can build on on-going research
- Fundable
- Range of “commodities”
- Potential for links with the CGIAR
- Significant food system
- High on the international agenda
- Regional diversity
- Delivers generic understanding/able to be extrapolated

A “projects x criteria” matrix could be developed to help identify elements of projects that could be from a GECAFS Integrative Study(s).

The SAC noted the need to involve more stakeholders. FAO would be able to help.

ACTION: John Ingram to discuss ways to involve more stakeholders with FAO.

Item 8: Consider further members for the SAC – *Peter Gregory*

See under Item 1, above.

ACTION: SAC to send suggested names to John Ingram by 31 May.

Item 9: Any Other Business

Item 9.1: ICSU Report for WSSD Johannesburg

The SAC recommended GECAFS prepare this paper as it will (i) serve to highlight the role GECAFS can play in showing how science and policy relevance can come together; and (ii) be an important GECAFS product in its own right. The interest FAO has in collaborating was noted: FAO's Global Projections of food supply under "business as usual" use levels of nourishment and interpretation of these regarding GEC would be a key GECAFS contribution.

It is important to tailor the paper for the WSSD audience, i.e. to show to non-scientists the value of using science to address societal issues.

A paper "GECAFS Paper for ICSU WSSD Series on Science for Sustainable Development" is attached to these Minutes.

Suggested authorship was discussed in the Exec Meeting on 25 April: It is proposed that the authorship should be the full GECAFS SAC. It is however realised that some members may prefer not to be listed on the authorship for institutional reasons.

ACTION: SAC to send comments on GECAFS WSSD paper outline to John Ingram by 24 May.

ACTION: SAC to confirm or otherwise to John Ingram that they are happy to have their name included on the authorship.

ACTION: Peter Gregory to send Thomas Rosswall suggested outline and possible authorship by 24 May.

Item 10: Date and Venue of Next Meeting

Undecided, but it was agreed to link this to a research planning meeting if possible.

Discussions on GECAFS Scenario and Vulnerability Science

Mike Brklacich introduced discussions on Scenarios and Vulnerability.

Scenarios

The SAC noted the need to identify what is important in given regions and use the scenario development to set boundaries for GECAFS analyses. This could be developed as a good communication tool. All regional projects must have a base scenario drafted, based on 5-10 year time steps. These could be developed in collaboration with FAO, IFPRI 2020 Vision and MA. The need to find proxies for some socioeconomic variables such as "access" was noted.

Making local and regional scenarios consistent with global scenarios is potentially problematic. A possible starting point for resolving this could be to take an already-established scenario and focus on developing a regional scenario appropriate for the project level.

A GECAFS product could be in bringing together attributes for scenario building, but a proposal would need to be written.

ACTION: John Ingram to discuss how to take Scenarios forward with Peter Gregory and Mike Brklacich.

Vulnerability

The SAC noted that the available indicators were not necessarily those most needed, and that alternative, or proxy indicators would need to be developed. An approach could be to aim for “profiling” or “typing” rather than a more formal index approach, as the index approach tends to characterise a region by the dominant characteristic which would miss the key vulnerability issues.

The SAC noted that this needs more debate and would form a key component of GECAFS research. The hoped-for grants for GECAFS Vulnerability studies in Asia and Africa (SAVI) (applications pending with ICSECA and ICSU, respectively) would be a starting point.

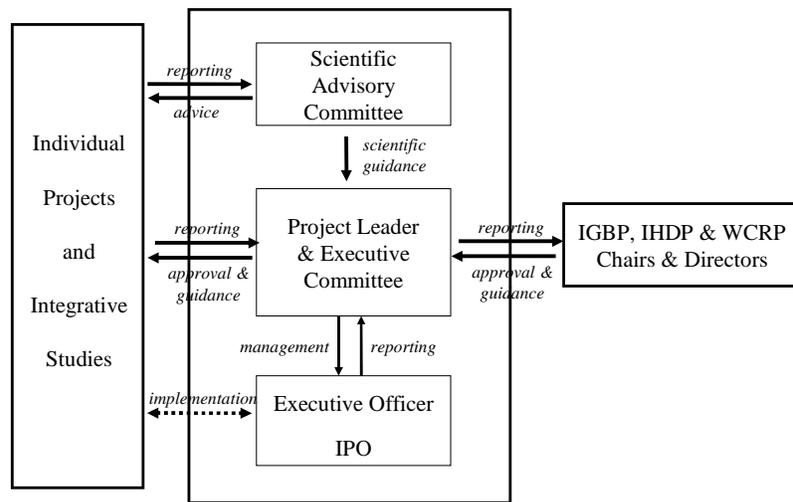
John Ingram
GECAFS Scientific Advisory Committee Secretary

Drafted: 16 May 2002

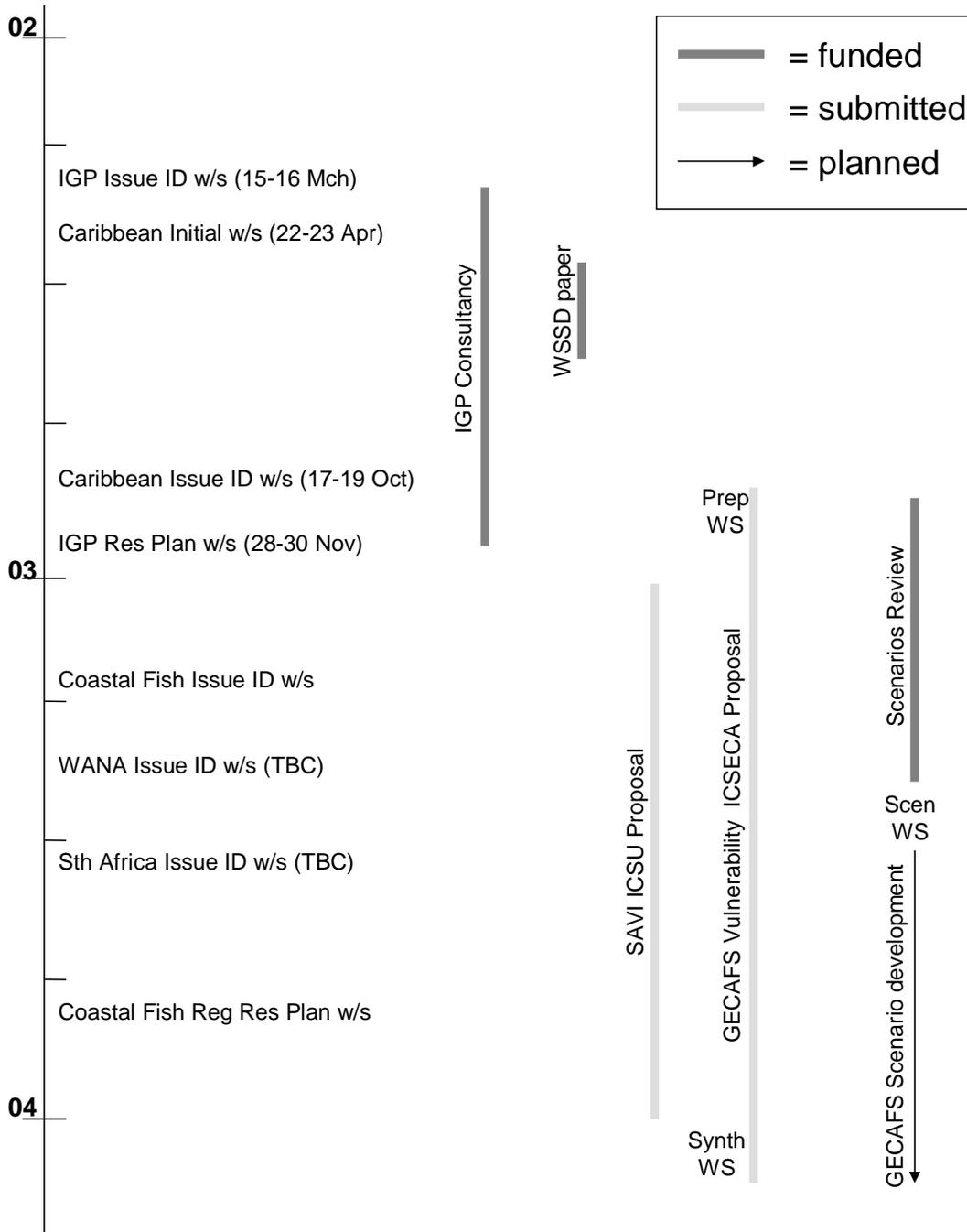
Confirmed: _____
Peter Gregory, GECAFS Chair

12 April 2003 _____
Date:

Revised GECAFS Management and Reporting diagram



GECAFS Timeline



Item 3: Matters Arising

IPO funding status and plans

ACTION: John Ingram to modify overall budget as appropriate.

Indo-Gangetic Plain Food System project planning developments

ACTION: John Ingram to (i) contact IGP Consultants; (ii) incorporate links to FIVIMS in FAO “agreement”; (iii) contact Peter Matlon.

Feedback from IGBP and IHDP SCs and WCRP JSC, and Draft Prospectus

ACTION: SAC to send comments on draft Prospectus to John Ingram by 24 May.

Discuss priority geographic regions and topics

ACTION: John Ingram to discuss ways to involve more stakeholders with FAO.

Consider further members for the SAC

ACTION: SAC to send suggested names to John Ingram by 31 May.

ICSU Report for WSSD Johannesburg

ACTION: SAC to send comments on GECAFS WSSD paper outline to John Ingram by 24 May.

ACTION: SAC to confirm or otherwise to John Ingram that they are happy to have their name included on the authorship.

ACTION: Peter Gregory to send Thomas Rosswall suggested outline and possible authorship by 24 May.

Discussions on GECAFS Scenario and Vulnerability Science

ACTION: John Ingram to discuss how to take Scenarios forward with Peter Gregory and Mike Brklacich.

Item 4: Report on Research Priorities set at the 2002 SAC Meeting

Discussion at the 2002 SAC noted the need to:

- (i) deliver a set of tangible products by the end of 2002:
 - a. IGP consultation paper
This was prepared on time and within budget and has been used to guide discussions in the IGP project development. Formal publication is now being discussed.
 - b. ICSU-WSSD paper (cf 9.1 below)
This was prepared on time despite a reduction in the timeframe originally agreed with ICSU. It was published by ICSU and widely distributed at WSSD in July.
 - c. GECAFS Prospectus
This was prepared with technical assistance from IGBP and funds from IHDP for printing 2000 copies. It has been widely circulated in late December and early 2003.
 - d. Scoping activity to identify “hotspot” regions.
No formal activity has been undertaken, but Southern Africa has been identified as an area where GECAFS activities would be welcome. General discussions with policy makers and potential donors identified other “hotspots” as defined by areas where rapid socioeconomic and/or biophysical change is underway or anticipated, and include the Central Asian Caucus, North Africa, the Mekong and the peri-Arctic.
- (vii) develop a database of existing, relevant research which could be brought together within the GECAFS framework

Plans for this are incorporated in Regional and Cross-cutting Projects.

- (viii) extract and interpret findings of existing work in a GECAFS context

Plans for this are incorporated in Regional and Cross-cutting Projects.

- (ix) find a “simple” example(s) to demonstrate GECAFS in practice

Examples are emerging as more detailed planning for Regional Projects develops. These show both the policy-relevance of research objectives and the way links to IGBP, IHDP & WCRP Core Projects and Strategic Partners can be built to mutual benefit.

- (x) develop a clear articulation of the types of research questions GECAFS can address

This has also emerged as Regional Project planning has progressed. The notion is best captured in reference to the proposed research questions.

- (xi) develop a framework to bring science and policy together.

This is emerging as GECAFS develops, capture in part in the GECAFS “research matrix”.

The SAC should note these developments.

Item 5: Reports of GECAFS Presentations to 2003 IGBP SC, IHDP SC and WCRP JSC meetings

IGBP: Punta Arenas, Chile 20 January 2003

John Ingram presented the Report.

The IGBP-SC was very positive to the progress we have made, and discussion was on detail rather than substance. Main issues raised in plenary [with my replies] were:

Very good to see where links to Core Projects can be made. How is this now to be done? [We are now actively inviting CP involvement in regional project planning.]

Are there any LDC scientists involved? [Yes - lots! Regional project development has been almost exclusively LCD involvement.]

How does GECAFS relate to IPCC - they have covered much of the GECAFS agenda already. And there is lots of agriculture research already - where's the new science? [IPCC is assessment not research (Berrien Moore's interjection). IPCC has only looked at some aspects of production, whereas GECAFS is interested in provision and the whole food system. Nearly all biophysical "agriculture" research deals with agroecology] (This question shows that some IGBP-SC have still not understood what GECAFS is about)

What about other regions of the world? [Further projects will be developed in consultation with the SAC - but keen to develop a well-balanced portfolio with a range of GEC issues.]

Will GECAFS include GM issues of high political debate (e.g. GM food aid in Southern Africa)? [No. We do not deal with food security at that high political level. But we would include GM technologies (as appropriate) as part of a package of adaptation tools.]

Subsequent "off-line" discussions with several IGBP-SC members revealed great interest in GECAFS: comments such as "really pushing the envelop"; "exciting new science agenda"; "excellent strategy re developing country engagement in GEC science"; "best example of integrated science"; etc.

IHDP: Bonn, Germany 5 March 2003

Mike Brklacich presented the Report.

[Feedback will be reported at the SAC Meeting.]

WCRP: Reading, UK 19 March 2003

John Ingram presented the Report supported with additional comments by Doug Whelpdale.

Report by Doug Whelpdale:

John's update on GECAFS activities was well received by the JSC. The discussion was supportive and constructive. The following points were raised:

- In response to John's description of the proposed GECAFS Pacific fisheries project, Busalacchi (CLIVAR SSG Chair) suggested collaboration with their North Pacific Panel, and Harrison (OOPC Chair) offered to share their experience with stakeholders in related work in the Pacific Northwest.
- Busalacchi indicated that a continuing role for CLIVAR in GECAFS would be important. (John invited him to come to Kathmandu.)
- Ogallo (JSC member; Drought Monitoring Centre, Nairobi) requested involvement by regional institutes in the South African project. He was informed that this had been done.
- Sorooshian (GEWEX SSG Chair) challenged John to specify what GECAFS meant when talking about climate change and variability. Carson (JSC JPO Director) responded that this was exactly what GECAFS was in the process of doing.
- Shukla (JSC member) challenged GECAFS to engage farmers in the IGP project. John emphasized that GECAFS worked at the regional level with food systems, not with individual farmers. Shukla also expressed a keen interest in the IGP project and discussed this further with John following the session.
- Gadgil (START SSC Co-Chair) suggested that GECAFS was infringing on CLIMAG turf. John explained that this was not the case.
- Ramaswamy (JSC member) requested that GECAFS specify more precisely to the JSC our needs with respect to scenarios. He was told that we were in the process of developing these needs through the cross-cutting scenarios project.
- Hoskins (JSC Co-Chair) emphasized that GECAFS must iterate with WCRP on our needs for scenario information, modeling applications, and required data. He was advised that we were formulating those needs in our various projects, and that policy needs influenced the types of information required by GECAFS.
- Lemke (JSC Chair), Hoskins, Denman (JSC member) and Carson all expressed support for GECAFS – both its role and progress.
- My sense was that a solid buy-in has been achieved, and that there WCRP is willing to be involved in GECAFS, particularly CLIVAR and two of the modeling groups (Working Group on Numerical Experimentation and Working Group on Seasonal to Interannual Prediction).

DMW
21 March 2003

The SAC should note feedback from the SCs/JSC.

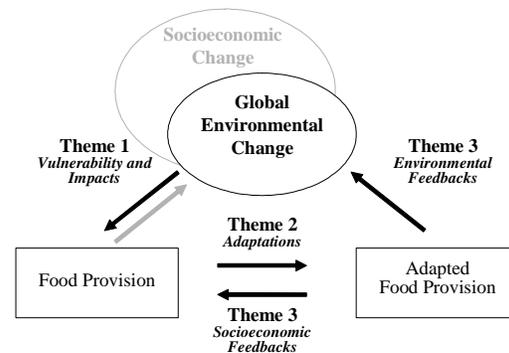
Item 6: Project Reports

GEC and the Food Systems of the Indo-Gangetic Plain

Project Background

“Global Environmental Change and Food Systems” (GECAFS) is an international research programme involving a wide range of social, physical and biological scientists, investigating the vulnerability of human food systems to, and interactions with, Global Environmental Change. The project’s goal is “To determine strategies to cope with the impacts of Global Environmental Change on food provision systems and to analyse the environmental and socioeconomic consequences of adaptation”.

A diagrammatic representation of the project’s three GECAFS Science Themes shows the links between GEC and food provision systems. The contextual issues of changing socioeconomic conditions and the consequences of current food provision systems on GEC are depicted in grey, while the main features of GECAFS are shown in black.



The GECAFS research phase will be launched with a project addressing the Food System of the Indo-Gangetic Plain. This is an important system for global change science as it is both threatened by climate and other global environmental changes, and further contributes to environmental concerns such as GHG emissions, water resource degradation, biodiversity loss, etc. Research is needed to help develop technical and policy strategies to promote systems which are more environmental-benign while enhancing socioeconomic conditions. For the research to be effective it is however important to plan and develop it in the context of information needs of national and regional policy makers.

The initial GECAFS workshop (Delhi, 15-16 March 2002) made (i) identified key national and regional policy issues related to GEC; (ii) identified regional and national policy and science groupings that could be consulted on the nature of a GEC research agenda; and (iii) broadened the environmental change debate to include other aspects of global change in addition to climate change. The workshop also brought together a range of viewpoints which were synthesised to give a foundation for more detailed discussions on specific research issues of interest to policy makers at regional and national levels.

Building on the March workshop output a short-term consultancy has elaborated on information needs of regional and national policy makers, and, together with an informal discussion meeting in Delhi (9 October 2002), outlined overarching research issues within the GECAFS framework. The next step was to convene a further, well-focused discussion meeting (19 November 2002) to debate the consultancy paper and to deliver a succinct set of researchable issues which collectively address the key needs for improved policy formulation in the face of GEC. Output from this meeting now sets the agenda for a larger workshop (2-4 April 2003) at which the research proposal will be planned in detail and research collaborators identified. The project will be implemented in close collaboration between the national and international global change research communities.

Rationale and possible Research Questions relating to GECAFS Science Themes

The food system in the Indo-Gangetic Plain (IGP) is largely dependent on rice and wheat grown in rotation. There is however growing evidence of overall yield stagnation and that productivity of the system (especially the rice component) is even declining in some areas: an assessment of 11 long-term rice-wheat experiments (ranging from 7-25 years in duration) from the region indicates a marked yield decline of up to 500 kg/ha/yr in rice in nine of the experiments (Duxbury et al., 2000). Continuation of these trends will have serious implications for food provision, local livelihoods and the regional economy. As a given season's weather is a major determinant of yield (due to both the direct effects on crop growth and indirect effects related to management), there is concern that changes in climate, especially related to changes in climate variability, will exacerbate the observed trend (the potential for more extreme weather events has been highlighted in the Third Assessment Report of the IPCC). Moreover, other analyses (e.g. Grace et al., 2001) show that the highly-intensive production approach currently practiced in large parts of the region is a major source of greenhouse gases, while the current irrigation practice is having serious negative effects on local water tables and water quality.

In the face of GEC, policy requirements are to develop strategies that:

- increase promote agricultural competitiveness while limiting further environmental degradation
- establish food provision systems which enhance the social security of the more vulnerable
- promote rural employment opportunities thereby reducing intra-IGP labour migration and urbanisation

Due however to the marked socioeconomic and biophysical differences across the region, a single approach is not appropriate.

Water management and diversification are both priority issues across the IGP but the GECAFS research questions for each Science Theme need to recognise marked socioeconomic and biophysical differences between Western and Eastern sub-regions:

IGP Western Region

- high investment in infrastructure, institutions and effective policy support
- intensive agriculture; high use of agrochemicals and ground-water for irrigation
- high productivity – food surplus region: responsible for national food security
- seasonal in-migration of male labour: social conflicts

IGP Eastern Region

- high risk of both flooding and drought
- poor infrastructure and limited capacity for private investment
- largely subsistence agriculture
- low productivity – food deficit region: poverty, hunger and malnutrition
- out-migration of male labour: increased involvement of women and children

Derived from the March workshop discussions and subsequent consultations with regional scientists and policy makers, Table 1 gives a list of key information needs (presented as research questions) for each region. The interdisciplinary research needed to address these needs to be developed in the context of parallel research on vulnerability and scenario development.

Table 1: “Key Information Needs” for policy development in relation to GEC

GECAFS Theme	Western IGP	Eastern IGP
Theme 1 Vulnerability and Impacts	<ul style="list-style-type: none"> • How will GEC (especially climatic variability) and increasing non-farm demands affect change in water supply and demand and consequent food system vulnerability? 	<ul style="list-style-type: none"> • How will GEC affect vulnerability of resource-poor farmers to flooding and drought, and how will this exacerbate existing socioeconomic inequities?
Theme 2 Adaptations	<ul style="list-style-type: none"> • How can changes in water management (e.g. through enhanced policy instruments, landuse strategies and community participation) and energy-efficient technologies reduce vulnerability of food systems to climate variability and other aspects of GEC? • How can increasing urban and agricultural wastes and water of inferior quantity be utilised in agriculture to adapt to reduced land and water availability? • Where, what forms and how much additional public and private investment would be needed to increase on-farm income, maintain water balance and diversify from rice-wheat system? • How can policies and institutional arrangements best be adapted to promote adoption of existing technology options to enhance production in the face of GEC while conserving natural resources? 	<ul style="list-style-type: none"> • What early warning systems of environmental change and its potential impacts would assist stakeholders to identify regions and communities of potentially greater insecurity? • What investment policies (e.g. insurance) would encourage farmers and society to adopt available technological options to reduce vulnerability to GEC? • What infrastructure, market opportunities and technical options need to be developed for diversifying crops (e.g. to aquaculture) to make more effective use of flood and groundwater, and what are the social constraints (e.g. food preferences) to their adoption? • What policy interventions are needed to reduce the number of hungry and/or undernourished people (especially women and children) considering that food production systems may become even more risk-prone? • What new institutional mechanisms in research and extension (e.g. involvement of NGOs and private sector) would facilitate generating, adapting, disseminating and utilising knowledge in managing increased risks due to GEC?

<p>Theme 3 Socioeconomic and Environmental Consequences</p>	<ul style="list-style-type: none"> • What will be the consequences of alternative approaches to water management and resource-conservation strategies on rural livelihoods, intra-regional trade, carbon sequestration and GHG emissions, and water tables? • What would be the consequences of diversifying from rice-wheat system on food production, government procurement, energy use, income and employment potential, resource conservation and GHG emissions? 	<ul style="list-style-type: none"> • How would diversification and increased government interventions (e.g. markets, roads, credit, flood control and extension services) affect food provision, rural income, equity, labour migration and employment, water use and quality, biodiversity, and GHG emissions?
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GECAFS Caribbean Food Systems Project

Summary: March 2003

The food systems of the Caribbean are highly dependent on imports, amounting to about US\$3 billion in 1999. Revenue for these imports currently comes primarily from export earnings from banana and sugar, and from tourism, all of which are highly vulnerable to Global Environmental Change (GEC). Of particular concern are potential changes in the frequency, intensity and tracking of tropical storms and hurricanes; and the environmental consequences of adapting the local food provision system in response to reduced export earnings.

Regional policy priorities include:

- Higher levels of food security and self sufficiency through increased productivity and diversification of agricultural and fisheries production.
- Improved trade policies and competitiveness through greater export of high quality produce and processed products.
- Enhanced sustainability of the food and agricultural sector and poverty alleviation in rural communities, through greater opportunities for rural employment.

The region is characterised by:

- Many small island states
- Diverse cultures, environments and food provision systems
- Great dependence on food imports
- Reliance on export crops, tourism & other non-food sectors (e.g. minerals) to provide revenue
- Susceptibility to weather extremes
- Susceptibility to changes in preferential export markets
- Weak regional-level institutional connectivity

In the short-term it is clear that climate variability and changes in extreme weather events are the most important aspects for the Caribbean region. Research needs to concentrate on disruptive effects of hurricanes and other extreme weather events (resulting in floods and drought for example) on food systems, but also consider GEC impacts on land and water resources and availability, and vulnerabilities of different sections of societies and countries. Better projections are also needed of sea and atmospheric temperatures and precipitation trends, and also of hurricanes and other severe weather systems; ENSO teleconnections and intra-regional variability; sea-level rise and length and timing of growing season in relation to rainfall.

An Interim Steering Group (comprising representatives from CARDI, CARICOM-Fisheries, CIMH, ECLAC, FAO, GECAFS and UWI) has overseen the development of a GECAFS project concept to date.

Overarching GECAFS Questions for Caribbean Food Systems

Theme 1: *How will GEC (especially land degradation, variability in rainfall distribution, sea surface temperature, tropical storms and sea-level rise) affect vulnerability of food systems in the Caribbean?*

Theme 2: *What combinations of policy and technical diversification in food harvested and traded for local consumption, in export commodities and in tourism would best provide effective adaptation strategies?*

Theme 3: *What would be the consequences of these combinations on national and regional food provision, local livelihoods and natural resource degradation?*

As the region comprises many independent states, each with their own set of priorities and conditions, research needs to look at both the local- and regional-levels. “Story lines” have been developed for these two spatial levels:

STORY LINE 1: LOCAL LEVEL

Target: Food systems in resource-poor communities based on fishing and locally-produced food crops.

Aim: To reduce food system vulnerability, especially in relation to changes in climate variability.

Theme 1 How would changes in climate variability and water availability affect food systems of communities on different islands?

Theme 2 How would current national and regional policy instruments (e.g. access to markets, insurance schemes, EEZs) best be adjusted to enhance the effectiveness of technical options for diversifying cropping systems and fisheries so as to reduce vulnerability to GEC?

Theme 3 To what extent would these strategies affect food provision by altering the proportional reliance on local vs. imported commodities, and how would changed land management and associated changes in runoff affect coastal fisheries and other aspects of coastal zone ecology and tourism income based on this?

STORY LINE 2: REGIONAL LEVEL

Target: Caribbean regional food provision.

Aim: To develop regional-level strategies to reduce the *additional* complications GEC would bring to regional food provision, given changing preferential export markets.

Theme 1 What additional factors would GEC bring to destabilise the region’s food system, and in particular what would be their impact on revenue generation from different cash commodities?

Theme 2 How could regional institutional changes best be introduced to sustain regional food provision by maximising diversification options and inter-island trade?

Theme 3 How would changes in intra-regional trade, and in policy and technical development at a regional level affect development in individual islands, and how could such changes be promoted to conserve the natural resource base of the region?

A Phased Research Approach

Phase I of the project included a series of Issue and Research Identification Workshops. It established the issues of interest to development and science at both national and regional levels and cast these in the form of researchable questions (as described above). Before addressing these questions directly it is important to build a foundation based on existing relevant research findings.

Phase II will assess and synthesise existing information to build a strong platform from which to launch the subsequent main research phase. A draft schematic for Phase II is attached. This preparative phase will have a range of outputs.

Phase II outputs

1. The characterization of food provision for a series of Case Studies representing the range of regional characteristics.
2. A synthesis and assessment of stresses on Food Systems which can also be of value to IPCC assessments. This be presented as an Overview Report with a set of Country Reports as appendices.
3. Prototype models of Caribbean Food Provision and examples of their applications as proof of concept.
4. An assessment of information needs to guide further national and international research.
5. A research proposal for follow-up activities (Phase III).

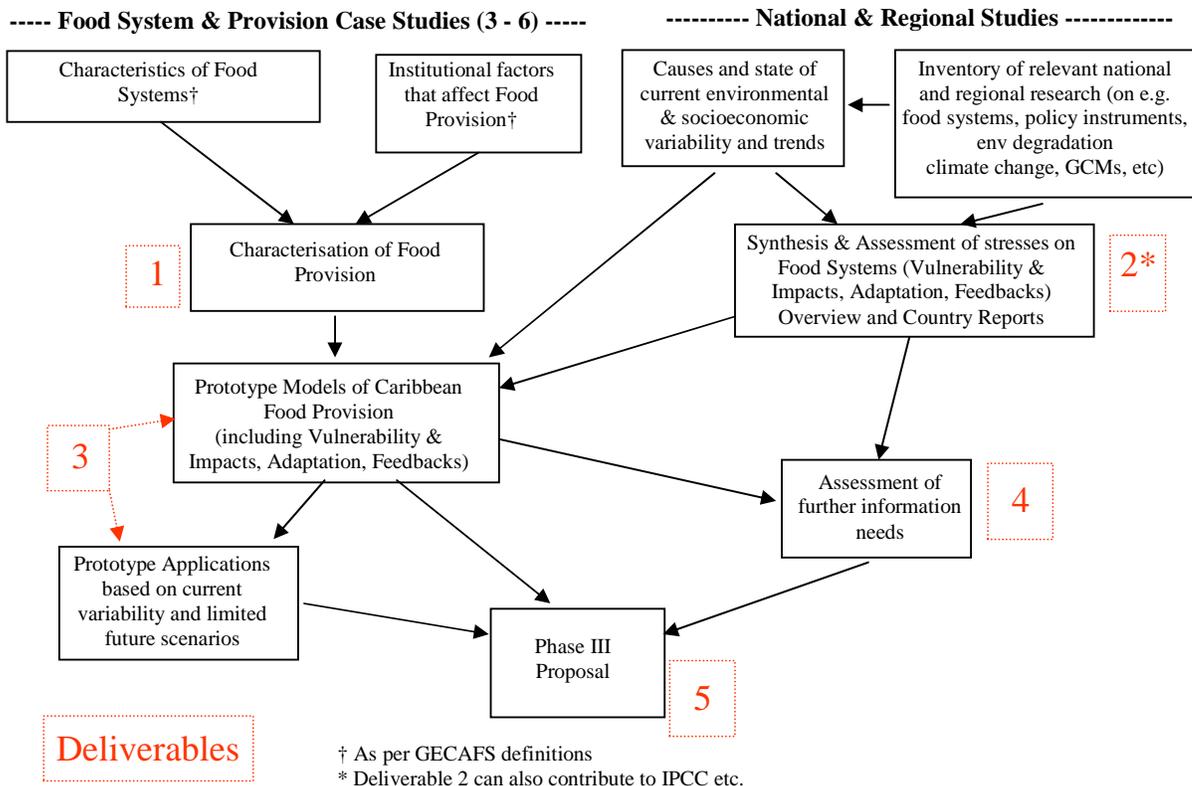
In addition Phase II will also:

- consolidate links between national and regional policymakers and scientists, and potential donors and thereby maintain project momentum within the region.
- consolidate links between regional research and the international GEC programmes.
- produce a Science/Implementation Plan based on the Phase III proposal to attract broader international scientific collaboration for the main research effort.

Phase II proposal preparation

The Interim Steering Group charged with guiding Phase I has now been disbanded and a 4-person Phase II Proposal Preparation Committee has been established comprising active scientists from a range of regional research organisations (Caribbean Institute for Meteorology and Hydrology, the CARICOM Fisheries Unit and the University of the West Indies) and joined by a representative from the GECAFS Executive Committee. Planning coordination will be provided by CARDI. All members served on the Interim Steering Committee so as to ensure continuity. This group is responsible for delivering a fundable proposal by mid-late 2003 for Phase II and will co-opt others as needed. A short “awareness-raising” brochure will be produced by end March highlighting key issues and the relevance of research avenues.

DRAFT SCHEMATIC FOR GECAFS CARIBBEAN PROJECT PHASE II



GECAFS Vulnerability Science Update

Research on the GECAFS Cross-cutting Vulnerability Science Theme has started with funding from US ICSECA and UK ESRC. These grants will help bring together and synthesise current efforts on vulnerability to establish a clear definition of what constitutes vulnerability in the context of GEC and how it might be best assessed.

ICSECA component (\$15k Planning Workshop; \$25k Review)

An International Workshop was convened in Washington DC in January 2003. It reviewed social science and ecological approaches and catalogues a range of information sources. It also helped design a Literature Review (2003) to define a conceptual framework within which to develop GECAFS vulnerability research. The work will be based at Carleton University, Canada under the guidance of Mike Brklacich.

ESRC component (\$41k Review and cross linking to ICSECA grant)

Working closely with emerging conceptual framework (ICSECA grant) the Review (2003) will document and synthesise literature on methodologies for evaluating vulnerability. The work will be based at the Stockholm Environment Institute-Oxford under the guidance of Tom Downing.

Plans for review approach

The plan for the review will follow a clear strategy over the year. It will begin by examining a review of literature, traditional approaches to food security vulnerability and the analysis of representative or 'best practice' case studies. This will involve considerable networking. The review will continue with the evaluation of a range of methodologies. The final outcome will be a working paper outlining the results of the analysis, and a series of recommendations for future research.

The SAC should note developments in GECAFS Projects.

Item 7: Future Project Plans

Eastern Pacific Coastal Fisheries: Initial Concepts

Rationale:

Considerable progress has been made in understanding the impacts of GEC on the productivity and structure of marine ecosystems in the Eastern Pacific. Research now needs to be extended to develop management options for adaptation to these impacts and to analyse the possible biophysical and socioeconomic consequences of different adaptation strategies.

General Objective:

To develop strategies to reduce societal vulnerability to changes in marine ecosystem productivity induced by El Niño/La Niña and other aspects of GEC.

Example Overarching GECAFS Questions:

Theme 1 - How will climate variability and other aspects of GEC affect food systems and livelihoods dependent on pelagic, demersal and coastal fishing?

Theme 2 – What management and policy strategies will best reduce the vulnerability of fisheries-based livelihoods to climate variability and increase employment opportunities?

Theme 3 – What will be the consequences of alternative strategies for local and regional biodiversity, and for poverty alleviation in coastal communities?

Proposal for collaboration with GLOBEC Focus 4 & LOICZ

1. Informal discussion at IGBP Congress in Banff on potential IGBP collaboration (involving GLOBEC F4, GECAFS & LOICZ). 1 - 2 hours.

Aim: To decide the spatial and thematic scope of an initial joint effort, and plan step 2.

Invitees: Cisco Werner, Ian Perry, Rosemary Ommer, Mike Brklacich, Dagoberto Arcos, Tim Baumgartner, Manuel Barange, John Ingram, Han Lindeboom, Peter Burbridge, Harwig Kremer

2. An “issue identification” meeting with managers and policymakers, under the auspices of Comision Permanente del Pacifico Sur (CPPS; South Pacific Permanent Commission). ?October 2003 at CPPS Secretariat if possible (?Peru). To be held in Spanish with translation if possible. 2 days max.

Aim: To determine information needs of national and regional fisheries policy-makers and managers to help planning and preparedness in relation to GEC, and thereby reduce vulnerability of livelihood systems dependent on fisheries.

Invitees: Regional policy makers & managers; regional social, climate and fisheries scientists; GLOBEC, GECAFS & LOICZ reps as appropriate; potential funders (approx 25 participants m

Scoping Paper on GECAFS Scenarios Project

The purpose of this paper is to propose the way forward to set the GECAFS Scenarios project in motion.

Requirement

Scenarios that are developed to be the basis of GECAFS activities in general, and GECAFS regional projects in particular, should be as consistent as possible with those being developed for other concurrent major international activities, specifically the Millennium Assessment and the Fourth Assessment Report of the IPCC.

The development of GECAFS scenarios will require that we are able to specify, *inter alia*

- How the scenarios will be used (e.g., as a set of background conditions and assumptions upon which a GECAFS project is developed, as input conditions (e.g., greenhouse gas emissions) for models used to project future global environmental change, or as specified future climate conditions).
- Who will use the scenarios (e.g., stakeholders who design the regional projects, climate modelers, planners who work with project outputs).
- Which variables and conditions must be specified (e.g., biophysical conditions, societal behaviour, economic conditions).

Definitions

The term ‘scenario’ has a variety of meanings, depending on the discipline and user. We must ensure that all participants have a clear understanding of the various definitions being used. For example, in the climate change world, the term ‘scenario’ is used to describe a ‘plausible future state of the climate system...’ [give full IPCC WG 1 or 2 definition and reference].

Next Steps

- Engage a knowledgeable individual to lead this activity for GECAFS.
- Consult with the Millennium Assessment (Rik Leemans?) and IPCC 4AR (Martin Manning?) folks to develop an understanding of their scenario work and to assess what is currently available (e.g., those developed for the IPCC TAR). This could take the form of a small meeting or workshop, preferably before the end of 2003.
- Consult with stakeholders in each GECAFS Regional project (as we proceed) to understand their special requirements for scenarios (i.e., global scenarios may not take adequate account of specific regional conditions).

Outputs

We might anticipate two types of scenarios as outputs. The first would be one or more global scenarios that anticipate societal, economic and environmental conditions years and decades hence (e.g., the IPCC TAR type scenarios). These would include an agreed limited set of variables with rather large temporal and spatial resolution, and would provide the backdrop for GECAFS work. The second type would be region-specific scenarios, preferably built on the first type, but adapted as necessary in terms of specific regional conditions. They would

probably also be of finer spatial and temporal resolution, and include specific variables pertinent to the region and study.

An example here that might facilitate discussion is the current status of climate change scenarios. The type of information that could easily be gathered is

- A clear statement of what they are.
- Several examples of available scenarios.
- A description of what they are based on and how they are derived.
- A description of their limitations.
- Sources of information that provide guidance to users.
- Web sites where they are available.
- An assessment of their consistency with MA or IPCC scenarios (would require some effort).
- A listing of scientists involved.

Criteria for GECAFS priority geographic regions and topics

Reports of GECAFS projects in the Indo-Gangetic Plain (IGP) and the Caribbean Food (CFS), and planned projects in Southern Africa and the Eastern Pacific, to the 2003 Meetings of the IGBP SC and WCRP JSC both resulted in some discussion of priority regions. Similar discussion has arisen in meetings with donors and policy makers. A clear definition of GECAFS criteria for project selection is needed.

Minutes from the 2002 SAC meeting:

Given the wide range of possible regions/topics for GECAFS projects, criteria need to be established which help with prioritisation. (Criteria for what should be included within an individual project have already been established.)

Possible selection criteria include:

- 1. Range of GEC “issues” (e.g. water availability, El Niño, land management, etc.)*
- 2. Can build on on-going research*
- 3. Fundable*
- 4. Range of “commodities”*
- 5. Potential for links with the CGIAR*
- 6. Significant food system*
- 7. High on the international agenda*
- 8. Regional diversity*
- 9. Delivers generic understanding/able to be extrapolated*

A “projects x criteria” matrix could be developed to help identify elements of projects that could be from a GECAFS Integrative Study(s).

Within the regional projects, current effort is focussed on establishing regional priorities and on established initial research activities. While the potential “value” to the proposed “Integrative Studies” has been included as part of the regional project research planning, little emphasis has been placed on this aspect, attention being given to regional issues and priorities.

The growing portfolio of GECAFS research does satisfy these criteria, although the terms “significant” in #6 and “High” in #7 are hard to quantify. The SAC’s recommendation to include a Sub-Saharan African project (SAC1 Minutes Item 6) has been implemented with respect to Southern African.

Given the desirability of developing a balanced portfolio of GECAFS research,

- 1. The SAC needs to review the possible criteria discussed at the 2002 SAC Meeting, and recommend a clear set of criteria for regional selection and further possible “cross-cutting research”.**
- 2. Based on (1), the SAC needs to recommend priorities for further regional and cross-cutting GECAFS research.**

Attached: Project Portfolio Matrix & Project Development Matrix

Project Portfolio Matrix

Overview of ongoing and *planned* GECAFS projects in terms of 2002 SAC Minutes

“Possible selection criteria”

	Indo-Gangetic Plain	Caribbean	Southern Africa	Eastern Pacific	Vulnerability Research	Comprehensive Scenarios
Principal GEC Issues	climate variability; water resources	climate change; sea-level rise	<i>climate variability; land degradation</i>	<i>El Niño; marine biodiversity</i>	all	<i>all</i>
Ongoing Research	mainly “impacts”	“impacts”; “adaptation”	“impacts”; “adaptation”	mainly “impacts”		
Potential funding sources	CGIAR CPs; ADB; DFID; USAID; Foundations	CIDA; USAID; IAI; Foundations	USAID; DBSA; NOAA; Foundations	IAI; NOAA	IUSU; NAS; RCs	?
Range of “commodities”	rice & wheat	tubers; rice; fisheries; imports	<i>maize; livestock</i>	<i>livelihoods dependent on coastal fisheries</i>	n/a	<i>n/a</i>
Potential CGIAR links	IRRI; CIMMYT; ICRISAT; IFPRI; WFC	WFC	ILCA; CIMMYT; IFPRI	WFC	IFPRI	?
Significance of Food System	Grain basket for ca. 800 M	Ca. 80% of food imported		<i>local economies dependent on fishing</i>	n/a	<i>n/a</i>
Level on International Agenda	high	medium	<i>very high</i>	<i>low</i>	very high	<i>high</i>
Regional diversity	South Asia	Caribbean	<i>Africa</i>	<i>South America</i>	general	<i>general</i>
Nature of generic understanding gained	policy / water	trade	<i>Reducing vulnerability</i>	<i>ENSO</i>	new definitions of vulnerability	<i>improved scenarios</i>
Links with Core Projects	GCTE; LUCC; GECHS; IT; IDGEC; CLIVAR	LOICZ; GLOBEC; GECHS; IDGEC; CLIVAR	GCTE; LUCC; GECHS; IT; IDGEC; CLIVAR	GLOBEC; LOICZ; IDGEC	GECHS; IDGEC; CLIVAR	<i>all, potentially</i>

Project Development Matrix

GECAFS Projects will develop in mutually-supportive phases

I: Preparation & Scoping => clear research goals

II: Project start-up => assessment & synthesis of existing information

III: Main analysis => science & policy contributions

	Caribbean	Indo-Gangetic Plain	Eastern Pacific Fisheries	Southern Africa	Others ...
Vulnerability Science					
Comprehensive Scenarios					

Item 9: SAC Membership

SAC membership and Project Contacts

GECAFS Scientific Advisory Committee: Current Membership

Members

Peter Gregory, University of Reading, UK (*Chair*)
Mike Brklacich, Carleton University, Canada (*Vice-Chair*)
John Ingram, NERC-Centre for Ecology and Hydrology, UK (*Secretary*)
Jim Jones, University of Florida, USA
Linda Mearns, NCAR, USA
Mahendra Shah, IIASA, Austria
Luis Vieira, EMBRAPA, Brazil
Member 8^a
Member 9^a

Strategic Partner Members

Barbara Huddleston, FAO representative *Retired from FAO; replacement to be nominated by FAO*
Anne-Marie Izac, CGIAR representative *Resigned*
Ray Motha, WMO representative

Donor Liaison Members^b

Oran Hesterman, WK Kellogg Foundation
Bill Sugrue, USAID
Representative from the Regional Development Banks^a
Donor Liaison Member 4^a

Sponsoring Programme Representatives

Dagoberto Arcos, Fishery Research Institute, Chile
Mohamed Salih, Institute of Social Studies, The Netherlands
Maarit Thiem, IHDP Secretariat, University of Bonn, Germany (Observer)
Doug Whelpdale, Meteorological Service of Canada

^a *Further members will be invited as GECAFS develops and needs become apparent. This will also help with the process of rotation of SAC membership in due course.*

^b *Representatives from donor agencies are invited in a liaison capacity.*

The SAC needs to consider further nominations for the following positions:

Member #8
Member #9
Replacement for CGIAR rep
Representative from the regional development banks (Donor Liaison Member #3)
Representative from the national research councils (Donor Liaison Member #4)

SAC Principal Project Contacts

As the GECAFS portfolio develops it is increasingly hard for all SAC and Exec members to monitor and contribute to the workplan. It is proposed that each component project should have a “principal” SAC member(s) linked to it. These members would endeavour to take specific responsibility for working closely with the Executive Officer with respect to the following projects, participating in relevant meetings as far as possible and in helping to integrate them with other GECAFS activities.

Suggestions need to be based on scientific background and geographical location.

Regional Projects

Indo-Gangetic Plain
Caribbean
Southern Africa
Eastern Pacific Fisheries

Cross-cutting Projects

Vulnerability Science
Comprehensive Scenarios

The SAC needs to consider this arrangement and agree which member(s) could take specific contact roles.

Item 10: Confirmed and Potential GECAFS Awards

Confirmed and Potential GECAFS Awards 2002 – 2004/5

(Correct at 26 March 2003) (£1 = US\$1.6= €1.45=SEK13.56)

Table 1: Confirmed Core Funding

Source	Purpose	Duration	Amount	Status
UK-NERC	Core (IPO staff and travel)	4/2002-3/2003	£82k	Awarded
IGBP/IHDP/WCRP	Core (Project management)	2002	\$28k	Awarded
IGBP/IHDP/WCRP	Core (Project management)	2003	\$45k	Awarded
Estimated US\$ equivalent			\$204k	

Table 2: Confirmed Project Funding

US-NOAA	General Planning	2002-2003	\$120k	Awarded
Sweden	General Planning	2002	SEK99k	Awarded
ESF Honorarium	General Planning	2002	€1k	Awarded
DfID	IGP Planning	2002	£40k	Awarded
IAI	CFS Planning	2002	\$4k	Awarded ¹
US-NAS ICSECA	“Vulnerability” w/s #1	2002-2003	\$15k	Awarded
US-NAS ICSECA	“Vulnerability” Literature review	2003-2004	\$25k	Awarded ²
ESRC	“Vulnerability” Literature review	4/03-3/2004	£40k	Awarded
US-NOAA SAF	SAF w/s	4/2003	\$2k	Awarded ¹
Estimated US\$ equivalent			\$306k	

¹ = IAI and NOAA awards contributed as direct travel awards to participants

² = ICSECA award being paid directly to Carleton University

Table 3: Potential Core Funding

UK-NERC	Core (Project management)	4/2003-3/2004	£82k	Submitted
US-NSF / USGCRP	Core	9/2003-9/2005	\$100k	Submitted
USAID	Core	9/2003-9/2005	\$1,000k	In draft
Estimated US\$ equivalent			\$1231k	

Table 4: Potential Project Funding

US-NAS ICSECA	“Vulnerability” w/s #2	2003-2004	\$25k	Submitted
ICSU	SAF w/s and follow-up	2004	\$46k	Submitted
CGIAR W&F CP	IGP Phase II	9/2003-9/2005	\$1,390k	In draft
Estimated US\$ equivalent			\$1461	

The SAC needs to note Confirmed and Potential awards.