



# ***Fifth GECAFS Scientific Advisory Committee Meeting***

***Friday 19 May 2006  
09:00 – 17:30  
Oxford, UK***

## ***Agenda and Background Papers***

### **Principal Objectives of the 5<sup>th</sup> 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 2006-07

## Agenda

### GECAFS Fifth Scientific Advisory Committee Meeting Oxford, UK - 19 May 2006

#### DRAFT AGENDA

- SAC5/01: Welcome and Apologies – *Peter Gregory (No paper)*
- SAC5/02: Minutes of the 4<sup>th</sup> GECAFS SAC meeting (Washington DC, 20 May 2005) – *Peter Gregory (Paper SAC5/02)*
- SAC5/03: Matters Arising – *Peter Gregory (Paper SAC5/03)*
- SAC5/04: SAC membership – *Peter Gregory (Paper SAC5/04)*
- SAC5/05: Feedback from the 2005 Chairs and Directors Meeting – *John Ingram / João Morais (No paper)*
- SAC5/06: Receive research reports and review and advise on future plans
- Conceptual and methodological research*
1. Food Systems & Vulnerability of Food Systems – *Polly Ericksen (Paper SAC5/06/1 & Presentation)*
  2. Scenarios – *Thomas Henrichs (Paper SAC5/06/2 & Presentation)*
  3. Decision Support – *Arvin Mosier (Paper SAC5/06/3 & Presentation)*
- Regional research*
4. Indo-Gangetic Plain – *Polly Ericksen (Paper SAC5/06/4 & Presentation)*
  5. Caribbean – *Arvin Mosier (Paper SAC5/06/5 & Presentation)*
  6. Southern Africa – *John Ingram (Paper SAC5/06/6 & Presentation)*
- Related activities*
7. ESF/COST “Forward Look” on European Food Systems in a Changing World [re: GECAFS Food Systems and Scenarios research] – *John Ingram (Paper SAC5/06/7)*
  8. ESF/COST Workshop on research agenda setting [re: GECAFS Decision Support research] – *John Ingram (Paper SAC5/06/8)*
- SAC5/07: Feedback from February / March 2006 IGBP SC, IHDP SC and WCRP JSC meetings – *Mark Stafford Smith & John Ingram (Paper SAC5/07)*
1. Partnerships with Core Projects and with other ESSP Joint Projects and Integrated Regional Studies (IRS)
  2. Emergent global properties due to accumulation of local/regional effects related to food systems
- SAC5/08: Partnerships with CGIAR, FAO & WMO – *John Ingram (Paper SAC5/08)*
- SAC5/09: Determine Priorities for 2006-07 – *Peter Gregory (No paper)*
- SAC5/10: Confirmed and Potential GECAFS Awards (*Paper SAC5/10*)
- SAC5/11: Any Other Business
1. ESSP OSC November 2006 (*Paper SAC5/11/1*)
  2. GECAFS Conference April 2008 (*Paper SAC5/11/2*)
- SAC5/12: Date and Venue of Next Meeting (*No paper*)

**SAC5/02: Minutes of the 4<sup>th</sup> GECAFS SAC Meeting**

**4th GECAFS Scientific Advisory Committee Meeting  
NAS, Washington DC  
Friday 20 May 2005**

**DRAFT MINUTES**

**Present:**

***Members:***

Peter Gregory, Scottish Crop Research Institute, UK (*Chair*)  
Mike Brklacich, Carleton University, Canada (*Vice-Chair*)  
John Ingram, GECAFS IPO, UK (*Secretary*)  
Pilar Cornejo, ESPOL, Ecuador (*WCRP-JSC Representative*)  
Angela Cropper, The Cropper Foundation, Trinidad and Tobago  
Polly Ericksen, GECAFS IPO, UK  
David Hess, USAID, USA  
Jim Jones, University of Florida, USA  
Arvin Mosier, GECAFS IPO, USA  
Mahendra Shah, IIASA, Austria  
Mark Stafford Smith, Desert Knowledge CRC/CSIRO, Australia, (*IGBP-SC Representative*)  
Maarit Thiem, IHDP Secretariat, Germany (*IHDP Secretariat Representative*)  
Luis Viera, EMBRAPA, France

***Invitees:***

Sophie Paterson, GECAFS IPO, UK  
Monika Zurek, FAO, Italy

**SAC4/01: Welcome and Apologies**

Apologies were noted from:

Dagoberto Arcos, Fishery Research Institute, Chile  
Oran Hesterman, WK Kellogg Foundation, USA  
Barbara Huddleston, FAO, Italy  
Saleemul Huq, IIED, UK  
Linda Mearns, NCAR, USA  
Richard Mkandawire, NEPAD, South Africa  
João Morais, IGBP Secretariat, Sweden (*IGBP Secretariat Representative*)  
Ray Motha, WMO Representative  
Prabhu Pingali, FAO Representative  
Mark Rosegrant, CGIAR Representative

**SAC4/02: Minutes of the 3<sup>rd</sup> GECAFS SAC meeting (FAO, Rome 5 May 2005)**

Peter Gregory signed these as correct.

## **SAC5/02: Minutes of the 4<sup>th</sup> GECAFS SAC Meeting**

### **SAC4/03: Matters Arising** (*Italicised text from 3<sup>rd</sup> SAC minutes*)

*John Ingram to contact Martin Parry to discuss GECAFS and IPCC, and how to link GECAFS case studies with the IPCC 4<sup>th</sup> Assessment.*

Done – GECAFS is not formally involved in IPCC 4AR but several GECAFS scientists are.

*SAC to think about Chair and Vice-Chair post 2006 and send suggestions to Peter Gregory.*  
Underway.

*John Ingram to explore possible collaborations with private sector organisations and circulate suggestions to SAC for comment.*

Underway with Peter Gregory.

*SAC to send comments on Vulnerability Briefs (available from [www.gecafs.org](http://www.gecafs.org) outputs section) to John Ingram.*

Underway.

*SAC to send comments on Scenario Task Force make-up and mandate to John Ingram.*  
Done. Scenario Task Force established.

*John Ingram to obtain further information about SIDS and explore funding possibilities.*  
Done. No funding seems to be available at present.

*SAC to send responses on Southern African Report and how it can be used to progress the project to John Ingram.*

Underway.

*Barbara Huddleston and Tom Downing to send John Ingram Key Questions for Food Systems and Vulnerability, respectively.*

Done. Incorporated into Science Plan and Implementation Strategy.

### **SAC4/04: Feedback from the 2004 Chairs and Directors Meeting**

Peter Gregory reported a difficult year of poor communications with the Cs&Ds. Eventually the questions GECAFS Exec put to the Cs&Ds were replied to, several outstanding issues were resolved and there is a more optimistic outlook on communications. IHDP is acting as the focal point for GECAFS communications with the ESSP. The need for a clearer statement of ESSP aims and operations was however noted.

### **SAC4/05: Feedback from February / March 2005 IGBP SC, IHDP SC and WCRP JSC meetings**

#### ***IGBP***

Mark Stafford Smith represented GECAFS at the IGBP-SC as IGBP-SC GECAFS liaison representative. He reported concern over the overlap with the CGIAR and that GECAFS needs to be more explicit in its work on feedbacks to the Earth System. A couple of high-level issues could be addressed, e.g. N from agriculture. Links with GLOBEC and the possibility of GECAFS work in China were noted.

**SAC5/02: Minutes of the 4<sup>th</sup> GECAFS SAC Meeting*****IHDP***

John Ingram represented GECAFS at the IHDP-SC (there being no IHDP-SC GECAFS liaison representative at that time). Maarit Thiem reported a new interest in the science-policy interface, and is also looking for new collaboration with GECAFS. There will be a major IHDP conference in China in early 2006, and a GECAFS plenary talk linking hunger, vulnerability and GEC would be appropriate but it is unlikely a plenary slot could be established at this stage.

***WCRP***

There was no GECAFS representation at the WCP-JSC (there being no WCRP-JSC GECAFS liaison representative at that time) but David Carson made a short presentation on behalf of GECAFS. GECAFS will be a focus of attention at 2006 JSC (Pune, India). The appointment of JSC member Pilar Cornejo to the GECAFS Exec will greatly help communication with WCRP.

***General discussion***

GECAFS needs some “vignettes” to help present the project. The ideas of (i) a Briefing at the Woodrow Wilson Centre in DC in Sept 2005 related to the MDGs and based on regional data (during the UN General Assembly) and (ii) a major GECAFS meeting in about 2007 were considered. It was noted that “fragile states” is a major issue at present (especially in USAID) and that GECAFS could consider this issue, especially in relation to (environmental) security, as part of its vulnerability research.

**ACTION:** Peter Gregory & John Ingram to consider a major GECAFS Meeting in about 2007 and discuss at Exec8.

**ACTION:** John Ingram & Polly Ericksen to plan Woodrow Centre Briefing.

**SAC4/06: Receive research reports and review and advise on future plans*****Conceptual and methodological research*****1. Food systems concepts**

John Ingram reported on developments. The value of including a worked example for explanatory purposes was noted, while providing high visibility examples of GECAFS research, especially if linked to the MDGs. This could mean further highlighting assets, rights and tenure systems. The links between food systems and developments in international trade issues was also noted. The comment was made that it would be helpful to better elucidate the links/interactions among GEC and food systems, again via a worked example. Finally, the group recognised that the issue of adaptation of food systems (so as to lower vulnerability to GEC or in response to GEC) has yet to be addressed.

Three possible papers were envisaged:

1. FS concepts
2. FS worked examples
3. FS and vulnerability to include links to MDGs.

**SAC5/02: Minutes of the 4<sup>th</sup> GECAFS SAC Meeting**

## 2. Vulnerability concepts

Polly Ericksen reported on developments. It was stressed that GECAFS research must be focused, addressing the vulnerability of food systems to GEC, while noting that GEC can also bring opportunities. Although many links can be made to other GECAFS activities and science areas, the priorities for the coming year are science and operational products.

Two possible papers were envisaged:

1. Vulnerability concepts and framework, including consideration of indices.
2. Operationally-target analysis of vulnerability reduction (given that policy makers in regional project areas need practical help)

## 3. Scenario construction

Monika Zurek reported on developments. It was stressed that GECAFS global scenarios would set the boundaries for regional scenarios. Initial work should concentrate on “mining” existing scenarios for GECAFS-relevant material. The link to IAASTD was noted, as was the potential for a link to GLP. The Scenarios Working Group should be convened at the Jamaica SANREM meeting to assess progress.

**ACTION:** John Ingram to convene Scenarios Working Group at the Jamaica SANREM meeting.

## 4. Decision support

Arvin Mosier reported on developments. All agreed that the goal of GECAFS DSS is to support strategic decisions, and that the DSS should be demand, rather than science, driven. It is thus important that any technical modelling engages decision makers as far as possible in their development. The possibility of Millennium Challenge Corporation interest (in Nicaragua and Honduras) was noted. It was suggested that the Steering Committee should be better balanced regarding country representation and disciplines.

One possible paper was envisaged:

1. Science-based conceptual paper of DSS in the context of GEC.

**ACTION:** Jim Jones/Arvin Mosier to develop more balanced DSS Steering Cmmtt.

## 5. Indo-Gangetic Plain

Polly Ericksen reported on developments, particularly the use of a matrix approach to characterise food systems, and discussions of the potential of using the Water Poverty Index (WPI). Several questions arose, including:

- What would be the utility of a food systems index, and what would it be relative to? Vulnerability?
- The scale of analysis is meso, but a difficulty arises because indicators are measured at the micro or macro scale.

## **SAC5/02: Minutes of the 4<sup>th</sup> GECAFS SAC Meeting**

- What can be said at a regional scale, given that we are focusing on five case study sites?

The initial FS analysis in the IGP will help in identifying variables most important for scenarios and also a general approach for characterising other GECAFS regions.

### 6. Caribbean

John Ingram reported on developments. SANREM is a valuable step towards developing a GECAFS Caribbean project. The project needs to be anchored in a regional institution, and the SANREM PIs list needs to be expanded to include more Caribbean researchers.

**ACTION:** Arvin Mosier to expanded SANREM PIs list to include more Caribbean researchers.

### 7. Southern Africa

John Ingram reported on developments. The need for 3-5 case study sites was identified, perhaps focussing on sites which represent the diverse conditions across SADC and which are already receiving substantial research investment. We should also maintain links to SADC and NEPAD-CAADP. This will be addressed at the next workshop (Gaborone, mid-2005), as will funding strategies.

### 8. Endorsing research

GECAFS plans for endorsing research were agreed upon, noting this will help with outreach and networking. Sub-committees need to be established dealing with conceptual and regional applications, with the appropriate SAC member closely involved.

## **SAC4/07: Determine Priorities for 2005-06**

The SAC recommended the following priorities:

1. Focus on conceptual and regional work already being undertaken, and advance conceptual research in the context of regional efforts.
2. Deliver 3 or 4 science products related to conceptual research.
3. Create a short statement with hard facts and figures as to why GECAFS is important.
4. Consider a possible fourth area for regional research (suggestions included China, Afghanistan, Indonesia).

## **SAC4/08: SAC membership**

1. Membership update

The SAC noted the current membership status.

## **SAC5/02: Minutes of the 4<sup>th</sup> GECAFS SAC Meeting**

### 2. Rotation of Chair and Vice-Chair

Peter Gregory pointed out that ideally the person should be visible in both GEC and development communities. The possibility of a Chair from one community, and the Vice – Chair from the other was noted. Peter Gregory tabled a paper describing results of a search to date, and invited 2 SAC members to join a Nomination Committee. Mahendra Shah agreed to join, and it was suggested Angela Cropper also be invited. SAC were again requested to send suggestions to John Ingram, noting possible people might be identified from IPCC and GEO literature.

**ACTION:** John Ingram to invite Angela Cropper to join the Chair Nomination Committee

**ACTION:** SAC to send suggestions of new Chair to John Ingram.

### **SAC4/09: Confirmed and Potential GECAFS Awards**

The SAC Noted Confirmed and Potential GECAFS Awards.

### **SAC4/10: Any Other Business**

Regional Partnerships. Does GECAFS need to develop MoUs with major institutions in the three regions? Yes, as it would help with identifying local scientists and funding opportunities, would help take forward research finds and agendas after GECAFS involvement and would help anchor GECAFS research within the development agenda. GECAFS should only aim for MoUs with 1 – 2 appropriate regional institutions, and ask them to make the necessary links to others. Any funding requirements for specific collaborations should be factored into regional research proposals.

### **SAC4/11: Date and Venue of Next Meeting**

3 – 5 May 2006 in the IGP region

**ACTION:** John Ingram to confirm date and venue for SAC5.

\*\*\*\*\*

*Drafted June 2005*

*John Ingram*

*GECAFS Scientific Advisory Committee Secretary*

*Confirmed:*

\_\_\_\_\_  
Peter Gregory, GECAFS Chair

Date:

## **SAC5/03: Matters Arising**

### **Summary of Actions**

#### **SAC4/05: Feedback from February / March 2005 IGBP SC, IHDP SC and WCRP JSC meetings**

**ACTION:** Peter Gregory & John Ingram to consider a major GECAFS Meeting in about 2007 and discuss at Exec8.

**ACTION:** John Ingram & Polly Ericksen to plan Woodrow Centre Briefing.

#### **SAC4/06: Receive research reports and review and advise on future plans**

**ACTION:** John Ingram to convene Scenarios Working Group at the Jamaica SANREM meeting.

**ACTION:** Jim Jones/Arvin Mosier to develop more balanced DSS Steering Cmmtt.

**ACTION:** Arvin Mosier to expanded SANREM PIs list to include more Caribbean researchers.

#### **SAC4/08: SAC membership**

**ACTION:** John Ingram to invite Angela Cropper to join Chair Nomination Committee.

**ACTION:** SAC to send suggestions of new Chair to John Ingram.

#### **SAC4/11: Date and Venue of Next Meeting**

**ACTION:** John Ingram to confirm date and venue for SAC5.

**The SAC is asked to: Note the follow-up to SAC4 and advise on any further follow-up required.**

**SAC5/04: SAC Membership****GECAFS SAC Membership (wef 21 May 2006)**

The Scientific Advisory Committee (SAC) provides overall guidance, and in particular oversees the development of an active science programme; receives reports from GECAFS conceptual and regionally-based food systems projects; and prioritises activities of the science programme. The SAC considers the “big picture” and a wide combination of skills and affiliations is needed to offer robust advice on strategic direction.

The SAC comprises 12 scientists from a range of science communities. It includes the GECAFS Chair, vice-Chair and Executive Officer and a representative from each region where a GECAFS food system project is located. These 12 members are invited in their personal capacities, with approval of the IGBP, IHDP and WCRP Chairs and Directors. The SAC also includes a nominee from each of GECAFS’ strategic research partners (CGIAR, FAO and WMO). Finally, the SAC includes invitees from different types of funding agencies interested in GECAFS research. These individuals are invited in their personal capacities to contribute to the general scientific discussion, but also with the objective of providing a liaison role with the different types of agencies.

**General Members (12)**

<b>Name</b>	<b>Institution</b>	<b>Country</b>	<b>end Term</b>
Ahsan Ahmed <a href="mailto:aue_bup@citech-bd.com">aue_bup@citech-bd.com</a>	Bangladesh Unnayan Parishad (BUP)	Bangladesh	1 <sup>st</sup> Term Mch 09
Hans Bohle <a href="mailto:hbohle@giub.uni-bonn.de">hbohle@giub.uni-bonn.de</a>	University of Bonn	Germany	1 <sup>st</sup> Term Mch 09
Angela Cropper <a href="mailto:acropper@thecropperfoundation.org">acropper@thecropperfoundation.org</a>	Cropper Foundation	Trinidad & Tobago	1 <sup>st</sup> Term Mch 07
Barbara Huddleston <a href="mailto:barbara.huddleston@fao.org">barbara.huddleston@fao.org</a>	UN-FAO	USA / Italy	2 <sup>nd</sup> Term Mch 09
John Ingram <i>Secretary</i> <a href="mailto:jsii@ceh.ac.uk">jsii@ceh.ac.uk</a>	GECAFS IPO, Centre for Ecology and Hydrology	UK	<i>Ex officio</i>
Anne-Marie Izac <i>Vice-Chair</i> <a href="mailto:a.izac@cgiar.org">a.izac@cgiar.org</a>	Future Harvest Alliance Office	France / Italy	1 <sup>st</sup> Term Jun 09
Jim Jones <a href="mailto:jjones@agen.ufl.edu">jjones@agen.ufl.edu</a>	University of Florida	USA	2 <sup>nd</sup> Term Mch 08
Diana Liverman <i>Chair</i> <a href="mailto:diana.liverman@eci.ox.ac.uk">diana.liverman@eci.ox.ac.uk</a>	University of Oxford	UK	1 <sup>st</sup> Term Jun 09
Richard Mkandawire <a href="mailto:mkandawirer@nepad.org">mkandawirer@nepad.org</a>	New Partnership for Africa’s Development	Malawi / South Africa	1 <sup>st</sup> Term Mch 07
Tony Nyong <a href="mailto:ocean@entelchile.net">ocean@entelchile.net</a>	University of Jos	Nigeria	1 <sup>st</sup> Term Mch 09
Mahendra Shah <a href="mailto:shah@iiasa.ac.at">shah@iiasa.ac.at</a>	International Institute for Applied Systems Analysis	UK / Austria	2 <sup>nd</sup> Term Mch 08
Luis Vieira <a href="mailto:luis.vieira@embrapa.br">luis.vieira@embrapa.br</a>	EMBRAPA	Brazil	2 <sup>nd</sup> Term Mch 08

**SAC5/04: SAC Membership****Partner organisation nominees and donor community representatives**

To be Nominated by USAID	US-Agency for International Development	bi-lateral agencies
Oran Hesterman <a href="mailto:obh@wkkf.org">obh@wkkf.org</a>	WK Kellogg Foundation	Foundations
Ray Motha* <a href="mailto:rmotha@oce.usda.gov">rmotha@oce.usda.gov</a>	US-Department of Agriculture	WMO nominee
Prabhu Pingali <a href="mailto:prabhu.pingali@fao.org">prabhu.pingali@fao.org</a>	UN-FAO	FAO nominee
Mark Rosegrant <a href="mailto:m.rosegrant@cgiar.org">m.rosegrant@cgiar.org</a>	International Food Policy Research Institute	CGIAR nominee

*\* Note: Ray Motha makes the strong recommendation that it would be best not to have the President of the Commission for Agricultural Meteorology (Ray's role) as the SAC member due to the heavy travel and activities commitment that role brings and that a member of the Management Group would better placed to provided the GECAFS SAC liaison. He is consulting on this with WMO.*

**Sponsoring Programmes' SCs/JSC Liaison Members & Secretariat Nominees on the GECAFS Executive Committee Members acting as Observers on the SAC**

Mark Stafford Smith <a href="mailto:Mark.StaffordSmith@csiro.au">Mark.StaffordSmith@csiro.au</a>	Desert Knowledge Cooperative Research Centre	Australia	IGBP-SC
To be Nominated by IHDP	?	?	IHDP-SC
Pilar Cornejo <a href="mailto:pcornejo@espol.edu.ec">pcornejo@espol.edu.ec</a>	Escuela Politécnica Nacional	Ecuador	WCRP-JSC
João Morais <a href="mailto:morais@igbp.kva.se">morais@igbp.kva.se</a>	IGBP Secretariat, Stockholm		
Maarit Thiem <a href="mailto:thiem.ihdp@uni-bonn.de">thiem.ihdp@uni-bonn.de</a>	IHDP Secretariat, Bonn		

**The SAC is asked to: Note current SAC Membership and duration of Office.**

## SAC5/06/1: Food Systems and Vulnerability of Food Systems research report and future plans

### GECAFS Understanding of a Food System

GECAFS takes an integrated and holistic approach to “food systems”, so as to comprehensively analyze the interactions between food systems and global environmental change (see Figure 1). Food systems are often described as comprising four sets of *activities*: food production, processing and packaging, distribution and retail, and consumption. These activities lead to a number of *outcomes*, many of which contribute to food security and others which relate to environmental and other social welfare concerns. Including the outcomes as part of the food system concept helps by explicitly providing an analytical lens for understanding food security, the principal objective of the food system<sup>1</sup>. Food security is defined when: *all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life (World Food Summit, 1996)*. Food security outcomes are described in terms of three components and their sub-components: food availability (production, distribution and exchange); food access (affordability, allocation and preference); and food utilization (nutritional and social values, and safety).

Because of the GECAFS interest in both the interactions between GEC and food systems, and the tradeoffs among food security and environmental goals, GECAFS also includes determinants (or drivers) within its food system concept. The determinants comprise the interactions between and within biogeophysical and human environments which both determine how food system activities are carried out, and the nature of the outcomes. Further, although the food system activities have a large influence on food security outcomes, these outcomes are also determined by socio-political and environmental drivers directly.

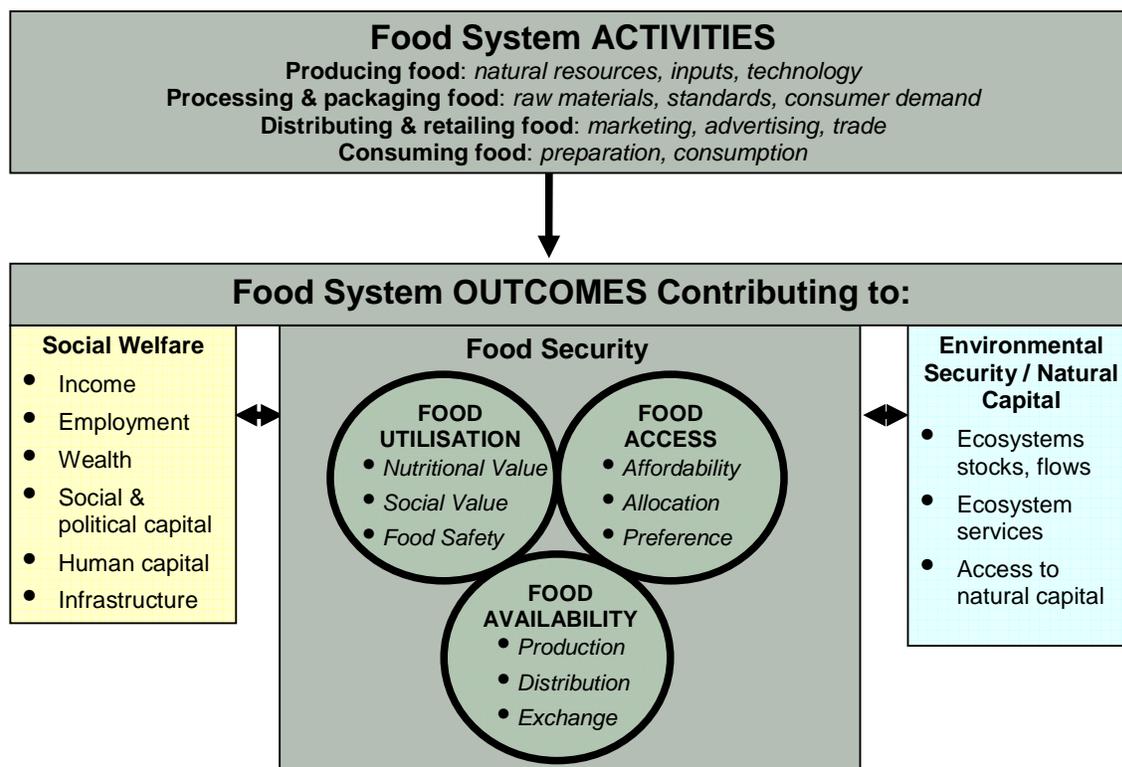
In order to capture these concepts holistically and to allow the analysis of GEC impacts, adaptations, and feed-backs, GECAFS analyses of food systems must therefore include:

- interactions between and within biogeophysical and human environments which determine a set of activities;
- the activities themselves;
- outcomes of the activities (contributions to food security, environmental security, and other securities); and
- other determinants of food security (stemming in part from the interactions in bullet one).

---

<sup>1</sup> Note: Food systems may or may not result in food security for the unit of analysis of concern (household, community, district). Determinants / drivers can “disrupt” or “distort” the food system so that it does not deliver food security.

## SAC5/06/1: Food Systems and Vulnerability of Food Systems research report and future plans



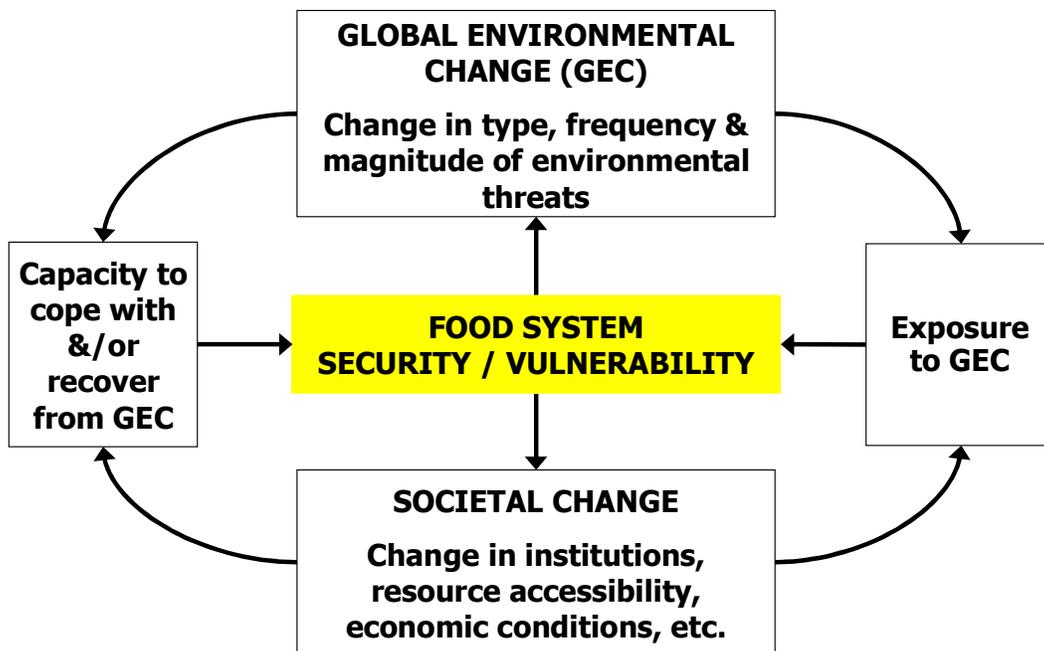
### GECAFS understanding of the Vulnerability of Food Systems:

Using the GECAFS framework for characterizing food systems should lead to identifying those components of food systems which make the food system as a whole vulnerable to GEC, and thereby undermine food security. A thorough food system characterization should also form the basis for the development of plausible adaptation strategies to enhance food system resilience.

The basic GECAFS framework for understanding “vulnerability” is captured in the second diagram, below. Generally, vulnerability implies harm due to the impacts of one or more shocks or stresses, from which it is difficult to recover. Often these stresses occur simultaneously or sequentially, and they have a synergistic effect which results in overall vulnerability. Critical to the understanding is the idea that vulnerability is a function of social as well as environmental processes, and that changes in institutions, etc are necessary to lessen vulnerability.

Vulnerability is differential and dynamic; hence within a food system for a specific place, some activities may be vulnerable but usually not all, and often not the whole system. In addition, the vulnerability of one component may be in contradiction to the security or stability of another.

### SAC5/06/1: Food Systems and Vulnerability of Food Systems research report and future plans



**SAC5/06/2: Scenarios research report and future plans****GECAFS conceptual research on Scenarios**

The \$100k secured from ICSU/UNESCO for 2005 was effectively used (1) to prepare a short review of Global Scenarios for Food Systems Analysis; and (2) to prepare a set of prototype Caribbean scenarios for research on global environmental change and regional food systems together with regional experts.

Summaries/details of the Review and Caribbean Scenarios Report are given below.

\*\*\*\*\*

***A Short Review of Global Scenarios  
for Food Systems Analysis*****GECAFS Working Paper 1**

Monika B. Zurek<sup>2</sup>

**Abstract:**

While global environmental change (GEC) clearly affects agricultural production, it is likely that GEC will also increasingly affect other determinants of food security such as food accessibility, food utilization and the stability of food supply. The questions of what impact future possible GEC dynamics could have, as well as how current decisions about GEC mitigation options and food system adaptation strategies might affect future food security are therefore emerging as crucial for decision-makers and scientists alike. Plausible futures/scenarios analysis has developed over the last decades as a tool for creatively and systematically thinking about the future of complex systems in order to inform decision-making. A number of scenarios exercises carried out over the last decade have either addressed food security or GEC issues. This paper reviews six important global scenarios and projection exercises as to their coverage of food systems and food security related variables to help guide further research on the future of GEC-food security interactions. Results show that the coverage of food systems and food security variables varies greatly between the exercises, as only two of the exercises specifically focused on agriculture and food, while the others addressed more general development or GEC issues. Variables related to food production and food availability were covered most comprehensively. Food accessibility and utilization parameters as well as direct GEC-food systems links were addressed to a lesser extent. This shows the need for further scenarios analysis in the area, which could deepen the insights gained from existing exercises.

---

ESAC, FAO, Rome, Italy, [monika.zurek@fao.org](mailto:monika.zurek@fao.org)

The author would like to acknowledge the financial support of ICSU and UNESCO during the time of the research and thank Johannes Edgren for his help as a research assistant.

**SAC5/06/2: Scenarios research report and future plans*****A Set of Prototype Caribbean Scenarios for Research on Global Environmental Change and Regional Food Systems****(Based on the Millennium Ecosystem Assessment Scenarios)***GECAFS Report 2**

Compiled and edited by Thomas Henrichs

## Table of contents

<b>1. Introduction &amp; Background</b>	<b>4</b>
<b>2. Approach</b>	<b>6</b>
Linking global and regional scenarios	
First Caribbean scenarios workshop	
Second Caribbean scenario workshop	
<b>3. The Global Scenarios (Millennium Ecosystem Assessment)</b>	<b>9</b>
Global Scenario 1: Global Orchestration	
Global Scenario 2: Order From Strength	
Global Scenario 3: Techno Garden	
Global Scenario 4: Adapting Mosaic	
<b>4. Four Caribbean Prototype Scenarios</b>	<b>14</b>
Key socio-economic driver developments	
Global environmental change in the Caribbean	
Food systems in the Caribbean	
<b>5. Response Options &amp; Adaptation Strategies</b>	<b>26</b>
<b>Scenario 1: Global Caribbean</b>	<b>29</b>
<b>Scenario 2: Caribbean Order from Strength</b>	<b>40</b>
<b>Scenario 3: Caribbean Techno Garden</b>	<b>46</b>
<b>Scenario 4: Caribbean Adapting Mosaic</b>	<b>53</b>
<b>References</b>	<b>58</b>
<b>Annex I – Participants</b>	<b>59</b>
<b>Annex II – Participants’ evaluation of workshops</b>	<b>61</b>

## SAC5/06/3: Decision Support research report and future plans

### GECAFS conceptual research on Decision Support

1. Dr Gabriele Bammer, Australian National University, has been commissioned (\$5k from IPO) to prepare a Review of Research-based Decision Support for Government Policy Decision Making with Particular Relevance to GECAFS (due Oct 06).
2. Initial GECAFS thinking on Decision Support Systems research placed considerable emphasis on the “Systems” angle, i.e. computer-based platforms and tools for analysing tradeoffs of govern adaptation options. While this component has not been lost, the overall vision for decision support had considerably broadened, now also encompassing a range of aspects from stakeholder engagement to the use of scenarios for awareness raising exercises. The text below is intended to replace that given in Section 2.4.4 (p 14) of the GECAFS Science Plan and Implementation Strategy (ESSP Report 2, GECAFS Report 1).

\*\*\*\*\*

### GECAFS Decision Support (DS) research

To be of use in supporting policy formulation, research on the development and assessment of possible strategies to adapt food systems to the impacts of GEC should be elaborated in the context of the policy process. As the food security-GEC debate encompasses many complex and interactive issues, a structured dialogue is needed to assist the collaboration among scientists and policymakers. This can be facilitated by using a variety of decision support (DS) approaches and tools, ranging from general discussions and mutual awareness-raising (including formal joint exercises such as scenarios construction and analyses) to simulation modelling, GIS and other tools for conducting quantitative analyses of trade-offs of given policy options (see fig). Application of this holistic DS process (i) raises awareness in the policy community of the interactions between GEC and food systems; (ii) identifies and communicates the options and constraints facing researchers and policymakers; and (iii) helps both researchers and policymakers assess the viability of different technical and policy adaptation strategies by analysing their potential consequences (feed-backs) for food security and environmental goals.

GECAFS DS research will bring together a number of different approaches: “Integration and Implementation” sciences to draw together and strengthen the theory and methods necessary to tackle complex societal issues and problems (Bammer, 2005); research on how an adaptive management ethic and practice that supports the concept of sustainable development can be initiated and implemented in complex, regional or large-scale contexts (Allen, 2001); and the adaptive management approach for incorporating communications, analysis and scenarios development (Lee, 1999; Gunderson, 2002). Such approaches will lay the foundations for delivering specific support for key policymakers at the national and regional levels (as outlined by Lal et al., 2001). These approaches rely upon a strategy that begins with identifying the key stakeholders, includes a process of reflection to develop a common understanding of the problem, and then proceeds through a joint learning process. This involves scientific researchers and policy and policymakers working together so that the best available scientific information informs policy.

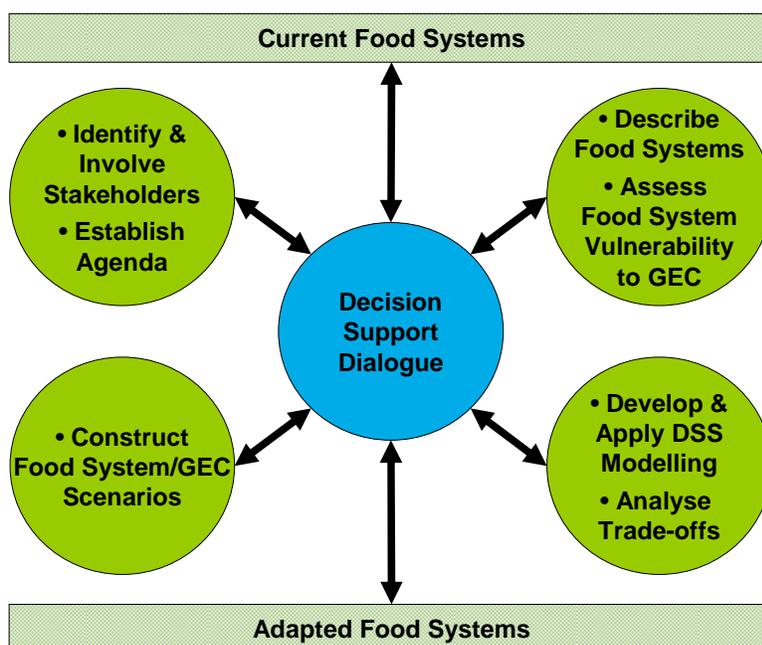
GECAFS is particularly interested in the analysis of trade-offs between socioeconomic and environmental goals in relation to food security-GEC issues. Policies aimed at reducing the vulnerability of food systems to GEC through technical and/or socioeconomic means may have

## SAC5/06/3: Decision Support research report and future plans

seriously deleterious – and often unanticipated – environmental feedbacks, or may raise new socio-economic concerns. A key aim of GECAFS regional projects is to help assess the consequences of differing adaptation options for a range of socioeconomic and environmental parameters, which needs improved, integrated modelling methods. Innovative DS platforms will be needed (such as the “Questions and Decisions” (QnD) system; Kiker et al., 2005; Kiker and Linkov, 2005) as they allow the incorporation of complex ecosystem models, and their linkage to environmental-based decision support tools, in a systematic way. They thereby help policymakers and other stakeholders understand and plan for impacts of global environmental change in the social, political and economic context in which decisions are made and policies are implemented. DS platforms will be used within a DS process that combines data processing and analysis, modelling, evaluation and assessment tools, enhanced concepts (e.g. vulnerability) and policy projections (regional, national, and international). The DS process will also use a range of dissemination mechanisms (e.g. policy briefs, printed maps). No single DS will fit the needs of all situations, so a flexible framework will be needed.

Considerable effort has been invested in designing and developing a wide range of models and other decision support tools under the general banner of “decision support systems” (DSS). Although these have usually been developed for specific purposes, their adoption by the anticipated end-user, and the efficacy of their use, have often been sub-optimal. This has usually been due to either a lack of adequate appreciation on the part of the researchers of the constraints and issues that affect decision making; or a lack of adequate appreciation on the part of the policymaker of the limitations of the given approach; or both. The aim of the GECAFS DS research is to develop approaches that will help policymakers and other stakeholders in clear and effective ways.

The figure shows how the various components of GECAFS research (*vis.* on food systems and their vulnerability to GEC; scenario construction; and trade-off analyses) can be brought together in a structured dialogue between scientists and stakeholders. It also shows the critical aspects of stakeholder identification and joint agenda setting.



*The various components of GECAFS research are brought together in a structured dialogue between scientists and stakeholders.*

## **SAC5/06/3: Decision Support research report and future plans**

The key DS research issues remain unchanged:

- (i) what is the best way to determine the information needs of advisors to policymakers, resource managers and other stakeholders regarding GEC and food issues?
- (ii) how can DS best be developed to help analyse the socioeconomic and environmental tradeoffs of adaptation options?
- (iii) what is the best methodological approach to DS development to optimise communication with stakeholders?

## SAC5/06/4: Indo-Gangetic Plain research report and future plans

### GECAFS IGP research in the Indo-Gangetic Plain

- 1) \$100k from the CGIAR Challenge Program was awarded to GECAFS to develop a methodology for food system description for use in the CP Basin Focal Projects (Aug 2005- Aug 2006). This contributes to both the IGP regional project and the Food Systems conceptual research.
- 2) \$180k from APN was awarded to the Nepal Water Conservation Foundation to lead a IGP-wide project to identify the vulnerability of case-study food systems in IGP to GEC in the context of socioeconomic issues/changes (June 2006 – June 2008). This builds substantially on the CP study, and contributes to both the IGP regional project and the Decision Support conceptual research.

Summaries of both projects are given below.

- 3) A proposal is in preparation to DFID to fund a GECAFS Scenarios exercise for the IGP.
- 4) GECAFS has joined an IFPRI-led group on an EOI for a further IGP Basin Focal Project

\*\*\*\*\*

### GECAFS Contribution to CPW&F BFP Methodologies

#### *GECAFS objectives and BFP links*

The Challenge Program for Water and Food (CPW&F) has established a set of Basin Focal Projects (BFPs). These aim to (i) provide an integrated framework for assessing the relationships among water and poverty, at a basin scale, and (ii) help develop appropriate interventions to alleviate poverty and vulnerability to water-related stress or problems. Returns on CPW&F investment in BFP activities, and preparation for further BFP initiatives, will be maximised by the development of robust and transferable methodologies and approaches, standardised as much as possible.

The Global Environmental Change and Food Systems (GECAFS) project is a comprehensive and interdisciplinary research programme focused on understanding the interactions between food systems (as they underpin food security) and global environmental change (GEC). A particular set of objectives for the GECAFS program is to understand how and why food systems are vulnerable to GEC. This understanding can then be used to support the development of interventions to enhance the adaptive capacity of food systems in the face of current and future change. GECAFS therefore addresses the BFP concern of identifying the effects on food systems and associated water use in basins of modifications in water availability arising from plausible environmental and socioeconomic changes.

The GECAFS approach requires an assessment of the characteristics of food systems in a particular area as an essential preparative step to determining how these systems are vulnerable to GEC. Options for reducing their vulnerability can then be explored. This process engages stakeholders in the research process from the beginning, so that the assessment of food system vulnerability is accurate and shared by all those involved, and so that interventions to lessen this vulnerability are both acceptable and feasible. A standardised, generic methodology for such characterisation, suitable for use in other BFPs, would provide a key foundation for CPW&F objectives relating to food security.

## SAC5/06/4: Indo-Gangetic Plain research report and future plans

The GECAFS approach is highly relevant to the BFPs, as the concerns of the CPW&F with poverty and water interact with GECAFS issues relating to food security and environment. GECAFS has chosen the Indo-Gangetic Basin (IGB) as one of its initial research regions because of the high dependence of its food systems on water availability and the multiple links between water stress and GEC. Based on preparative work in the IGB, GECAFS is now poised to develop a generic and transferable methodology for characterizing food systems in the region, with particular attention to relationships with food security, poverty and water. This standardised and field-tested methodology and approach would directly benefit the CPW&F BFPs in other basins and will also be used by researchers in the other GECAFS research regions of Southern Africa and the Caribbean.

GECAFS works with a group of researchers from Pakistan, India, Nepal and Bangladesh. Key contacts are listed in Appendix 1.

### *Proposed Objectives for CPW&F BFP funding*

Over the next twelve months, the GECAFS project in the IGB will work to achieve three main objectives:

1. Improve understanding of the vulnerability of food systems, and hence food security, to interactive socio-economic and environmental stresses induced by GEC, notably those stresses that relate to water and water management.
2. Document food systems and analyse the interactions with water stress and water management in five case study sites across the IGP.
3. Develop a methodology for basin-scale analysis based on analysing the diversity of food systems and their vulnerability to water stress in diverse case studies.

### *Budget for 12 months:*

IGB Literature review:

Regional staff time and operating costs	\$5,000
GECAFS IPO Staff time	\$2,000

First team workshop (December 05):

Travel, hotel and facilities	\$15,000
------------------------------	----------

Apply framework to five case study sites (September to December 05, February to June 06):

Regional Staff time \$10,000 per site	\$50,000
Operating costs \$2,000 per site	\$10,000
GECAFS IPO staff time:	\$3,000

Second team workshop (July 06):

Travel, hotel and facilities	\$15,000
------------------------------	----------

Grand Total:

**\$100,000**

By way of co-funding, GECAFS will provide input from science officers, funds for GECAFS personnel participation in workshops, and coordination with other GECAFS conceptual and regional research. The grant would be administered by the GECAFS IPO on behalf of the regional sites.

Key ref: Aggarwal, P.K., P.K. Joshi, J.S.I. Ingram, R.K. Gupta. 2004. Adapting food systems of the Indo-Gangetic plains to global environmental change: key information needs to improve policy formulation. *Environmental Science and Policy* 7: 487-498.

**SAC5/06/4: Indo-Gangetic Plain research report and future plans**

APN CAPaBLE Call for Proposals 2005 Part B:  
 “Comprehensive Research Projects for Capacity Enhancement”

**COLUMN 1**

**Title of proposed project:** Improving Policy Responses to Interactions between Global Environmental Change and Food Security across the Indo-Gangetic Plain (IGP)

**COLUMN 2**

**Proponent’s Name and Title:** Ajaya Dixit  
**Name of Organisation:** Nepal Water Conservation Foundation  
**Address:** Post Box 2221, Patan Dhoka, Lalitpur, Nepal  
**Telephone:** +977-1-552811, 5542354  
**Fax:** +977-1-5524816  
**Email:** nwcf@wlink.com.np  
**Website URL:** www.nwcf.org.np

**COLUMN 3**

**Brief description of the proposed Comprehensive Research Project’s relevancy to “Climate Change and Water & Food Security”**

Research will address key technical, policy and resource-management concerns related to how GEC-induced changes in water availability and access will affect the food systems which underpin food security in the IGP. The project will help to (i) raise awareness among the policy community and resource managers in the Indo-Gangetic Plain (IGP) of the regional food security issues relating to changed water availability and access due to climate and other global change issues; (ii) integrate natural, social, economic and policy research in developing decision support systems to help make informed policy for food security and environmental management; (iii) enhance capacity in the natural resource management and livelihoods research sectors related to food security; and (iv) consolidate regional collaboration across the four countries, linked to other APN countries and the international research community through ESSP-GECAFS. The project will be implemented by leading regional scientists in collaboration with others from APN “developed” countries and GECAFS, and conducted within the GECAFS conceptual framework. These links will enhance regional scientific capability on both technical and policy-related research. Research outputs will directly address several issues relating to climate change and food security as raised in the IPCC TAR, Agenda21/WSSD and key aspects of the APN 2nd Strategic Plan, specifically “Use of Resources (food/water) and Pathways for Sustainable Development”.

**COLUMN 4**

**Amount of APN funding requested 2006/2007:** **US\$180,000**  
**Duration of the project (years):** **Years: 2006-08**  
**Total amount requested over duration of the Project:** **US\$180,000**  
 Building on \$100k from CGIAR/CPW&F for GECAFS IGP base-line research; + \$60k co-funding from GECAFS

**COLUMN 5**

**List of the member & approved countries involved with brief description of their role.**

**Nepal** (Ajaya Dixit, NWCF): Project coordination, Nepal site research and coordination, and policy links;  
**Bangladesh** (Ahsan Ahmed, BUP), **India** (Rajinder Sidhu, PAU & Shiraz Wajih, GEAG), and **Pakistan** (Nazim Ali, GCISC): Respective national case-study site research and coordination, and policy links.  
**Australia** (Gabriele Bammer, ANU): Knowledge management, exchange and implementation; **New Zealand** (Will Allen, Landcare Research): Integrated information frameworks for decision making;  
**USA** (Greg Kiker, UF): GECAFS decision support systems development and QnD.

**SAC5/06/4: Indo-Gangetic Plain research report and future plans****COLUMN 6****Main Objectives**

1. Identify the vulnerability of case-study food systems in IGP to GEC in the context of socioeconomic issues/changes.
2. Enhance capacity within the APN scientific community to raise awareness of the vulnerability of case-study food systems in IGP to GEC within the policy making community.
3. Improve policy formulation by district and national institutions to enable and enhance district and national strategies for identifying adaptation strategies to reduce the vulnerability of IGP food systems to GEC.

**COLUMN 7****Summary of Proposed Project in 100 words**

Regional researchers from five case-study districts of the IGP will assess how GEC-induced changes in water availability and access will affect regional food systems, and hence food security. These assessments will build on analyses undertaken in these districts as part of an ongoing GECAFS/CGIAR-CPW&F project. Research will underpin the development of Decision Support Systems to aid policy formulation in support of adaptation options, with guidance from Australia, NZ and USA researchers involved in the GECAFS project. Work will include stakeholder workshops and 20 months of research and interaction with the policy community and resource managers for each case-study district.

**COLUMN 8****Expected Outcomes**

1. Improved cooperation within the APN region in relation to GEC/food security research for the IGP, and contributions to the developing ESSP-GECAFS agenda in the region.
2. Detailed analyses of how GEC-induced changes in water availability and access will interact with food systems, for five case studies representing the range of conditions across the region, published and circulated within the region and contributed to regional analyses in IPCC.
3. DSS developed to help improve national policy formulation by raising awareness of GEC/food security issues and analysing socioeconomic and environmental tradeoffs of alternative policy and technical adaptation options at national and regional levels. This will be linked to concurrent scenario construction for the IGP (funded separately).
4. Improved concepts for GECAFS Food Systems research, DSS research and scenario development.

**COLUMN 9****Summary of Proposed Project Methodologies**

1. Preparative workshop involving APN regional researchers, GECAFS Food System, DSS and Scenarios researchers, and the regional policy community to (i) discuss results from GECAFS/CGIAR research on case study food systems; (ii) to review latest GEC information relating to water availability for the region; plan further case-study analyses; (iii) outline DSS methodology and scenarios. [Punjab, India, June 2006]
2. Site visits by two-person teams of GECAFS DSS researchers to meet local policy and resource managers and to develop DSS methodology. [All five case study sites, July 2006]
3. Set of 20-month research exercises (one in each of five case study districts) to analyse effects of GEC-induced changes in water availability and access on food systems, to develop DSS, and to identify and analyse adaptation options. [All five case study sites, July 2006-May 2008, with scenario workshops interspersed]
4. Scenarios exercise, Jan-July 2007 (supported with co-funding): 2 workshops [Islamabad, Pakistan, January 2007; Dhaka, Bangladesh, July 2007]
5. Mid-term project-wide workshop to review progress (co funded by scenarios workshop, Dhaka, Bangladesh, July 2007)
6. Site visits by GECAFS DSS and Scenarios researchers to follow up on DSS utilization and initiate discussions of adaptation options, in light of the IGP scenarios. [All five case study sites, August 2007]
7. International workshop to present and discuss analysis of the adaptation options with a range of scientists and stakeholders. [Kathmandu, June 2008]

## **SAC5/06/4: Indo-Gangetic Plain research report and future plans**

### **COLUMN 10**

#### **Proposed Mode of Operation of the Project Team**

- Overall regional coordination by NWCF complemented by broader international & ESSP coordination by GECAFS.
- Site-based literature survey and interviews by national research teams.
- Site-based development of DSS in close collaboration with GECAFS DSS research.
- Joint workshops with APN region researchers, national policy community and other regional stakeholders, and GECAFS.

### **COLUMN 11**

#### **Detailed Description of Outputs and Timelines**

1. Report: Food systems/GEC descriptions for each case study district [June 2007]
2. Methodology: DSS documented [first draft June 2007; final including July 2008]
3. Report: Analysis of adaptation strategies [July 2008]
4. Enhanced capacity of APN researchers to contribute to improved policy development [July 2008]

**SAC5/06/4: Indo-Gangetic Plain research report and future plans****Appendix 1: Timeline 2006-08 as per stated Project Methodologies (column 9)**

Year	2006			2007				2008		Participation
Quarter	2	3	4	1	2	3	4	1	2	
1. Preparative Meeting										All
2. DSS Site visits										Country partners + DSS teams
3a. Research: food systems										Country partners + GECAFS FSV Science Officer
3b. Research: DSS										Country partners + GECAFS DSS Science Officer
4. Scenarios Exercise										PIs + GECAFS Scenarios team
5. Mid-term Meeting										Country partners + GECAFS Science Officers
6. Adaptn/Scenarios visits										Country partners + GECAFS Scenarios teams
7. Final Meeting										All
Regional Coordination										NWCF
International Coordination										GECAFS
Report writing										Country partners led by NWCF

**Budget estimate and numbered as per Timeline**

Activity	Number of participants	Unit cost \$	Total cost \$
<b>1. Workshop 1 (Punjab, India)<sup>1</sup></b>			
International Participants	4	2000	8000
Regional Participants	8	400	3200
Hotel & Per diems (4 days @ 100)	24	400	9600
Workshop venue	1 venue	1000	1000
<b>2. DSS Team site visits<sup>2</sup></b>			
Travel (2 trips each, ex Delhi)	4	500	2000
Hotel & Per diems (3 days each of 3 sites @ 100)	4	900	3600
Local travel	5 sites	250	1250
<b>3. Research Support (20 months each @ 750/month<sup>3</sup>)</b>	5 organizations	15000	75000
<b>4. Scenarios Exercise<sup>4</sup></b>			0
<b>5. Mid-term PIs meeting (Dhaka, Bangladesh)<sup>5</sup></b>			
International Participants	4	2000	8000
Regional Participants	6	400	2400
Hotel & Per diems (3 days @ 80)	10	240	2400
Workshop venue	1 venue	500	500
<b>6. DSS Team site visits<sup>6</sup></b>			
Travel (2 trips each, ex Dhaka)	4	500	2000
Hotel & Per diems (3 days each of 3 sites @ 100)	4	900	3600
Local travel	5 sites	250	1250
<b>7. Final meeting (Kathmandu, Nepal)<sup>7</sup></b>			
International Participants	4	2000	8000
Regional Participants	16	400	6000
Hotel & Per diems (4 days @ 85)	20	340	6800
Workshop venue	1 venue	1000	1000
<b>8. Regional Coordination<sup>8</sup></b>			
Regional Coordinator/administrator in NWCF	1	15000	15000
Regional Coordinator/administrator in NWCF travel	10 trips	500	5000
Operating cost and overheads to NWCF (8.5%)			14400
<b>Total</b>			<b>180000</b>

**SAC5/06/5: Caribbean research report and future plans****GECAFS regional research in the Caribbean**

- 5) \$35k was secured from the USAID-SANREM Program for planning a major proposal for GECAFS Caribbean regional research. Although highly rated, the main proposal was unsuccessful as the principal focus of the grant program was natural resource management rather than food security *per se*. Nevertheless the grant consolidated the regional team (as did the ICSU Scenarios conceptual research project) and helped prepare for another USAID proposal (\$768k/3 years) more central to GECAFS activities.
- 6) The Caribbean Science Plan and Implementation Strategy is nearly completed. In preparation GECAFS contracted UWI (\$1.5k) to compile relevant ongoing work in the region.
- 7) A multi-author paper on regional GEC/food security issues is being drafted for *Environmental Science and Policy*.

Summaries of the USAID projects and Science Plan and Implementation Strategy are given below.

\*\*\*\*\*

**USAID Global Climate Change Grant Application**

**Project Title: Adapting Caribbean Food Systems to Improve Food Security in the Face of Environmental Stress**

**Targeted countries/region:** Caribbean region targeting Guyana, and Jamaica

**Lead Institution:** Agricultural and Biological Engineering Department, University of Florida

**Lead Collaborating Institutions:** Caribbean Region: Caribbean Community Secretariat (CARICOMSec), Georgetown, Guyana; Guyana: National Agricultural Research Institute, Mon Repos, East Coast Demerara, Guyana; Jamaica: Ministry of Agriculture, Hope Gardens, Kingston, Jamaica

**PI:** Dr. Greg Kiker, Assistant Professor, Agricultural & Biological Engineering Department, PO Box 11057, Frazier Rogers Bldg., Museum Road, University of Florida, Gainesville, FL 32611, phone: 352-392-1864 (ext 291); fax: 352-392-4092; email: [gkiker@ufl.edu](mailto:gkiker@ufl.edu)

**CO-PIs:** **Dr. Walter Baethgen**, Director, Latin America/Caribbean Program, International Research Institute for Climate Prediction (IRI), Columbia University; **Dr. Mike Brklacich**, Professor, Department of Geography and Environmental Studies, Carleton University (CU); **Dr. Polly Ericksen**, Project Officer, Global Environmental Change and Food Systems, International Program Office (GECAFS IPO); **Mr. Ronald M. Gordon**, Deputy Program Manager, Agricultural Development, Caribbean Community Secretariat (CARICOMSec); **Dr. Oudho Homenauth**, Director, National Agricultural Research Institute, Guyana; **Mr. John Ingram**, Executive Officer, GECAFS IPO; **Dr. James W. Jones**, Distinguished Professor, Agricultural & Biological Engineering Department, University of Florida (UF); **Mr. Sam Lawrence**, Advisor, Regional Transformation Program for Agriculture, CARICOMSec; **Dr. Joseph Lindsay**, Principal Research Director, Bodles Research Station, Ministry of Agriculture (MOA), Jamaica; **Dr. Wendell Parham**, Director, Caribbean

## SAC5/06/5: Caribbean research report and future plans

Agricultural Research & Development Institute (CARDI); **Dr. Adrian Rodriguez**, Inter-American Institute for Cooperation on Agriculture (IICA), Sustainable Rural Development Specialist; **Dr. Ranjit Singh**, Head, Department of Economics and Extension, The University of the West Indies (UWI); **Dr. Susan Singh-Renton**, Program Manager, Research and Resource Assessment, Caribbean Regional Fisheries Mechanism (CRFM); **Ms. Donna McRae-Smith**, Program Officer Sustainable Development Program, CARICOMSec; **Mr. Adrian Trotman**, Agrometeorologist, The Caribbean Institute for Meteorology and Hydrology (CIMH); **Dr. Neville Trotz**, Director, CARICOM Climate Change Centre (CCCCC), Belize.

**Project period:** July 1, 2006 through June 30, 2009; **Funds requested:** \$767679

### Executive Summary

**Background:** Food insecurity is a principal concern for more than 25% of the people in the Caribbean. There are multiple threats to food security including extreme weather events, loss of preferential trade markets, inadequate agri-food infrastructure and fragmented regional and national policies. Global Environmental Change (GEC), especially climatic change, will complicate agri-food and environmental policy-making in the region and, in combination with social and economic constraints, further entrench food insecurity. Enhancing food security requires that agri-food and environmental policies in the region routinely and systematically address these multiple threats at national through regional scales.

**The goal of the proposed project is to reduce the vulnerability of Caribbean food systems to Global Environmental Change (GEC) by improving policy formulation capacity at national and regional levels.**

This project was developed by a group of interested persons and organizations from the Caribbean region (e.g. National agencies within Guyana and Jamaica and Regional Agencies CARICOM, CARDI, CIMH, UWI) to be part of the GECAFS Caribbean Regional Program. Based on food security priorities for Guyana and Jamaica and goals of the USAID Missions within these countries, the following national level key questions were developed: **Guyana:** *How can diversification and other strategies be developed to offer new livelihood opportunities to buffer the deleterious effects of GEC stresses and minimize further environmental degradation in coastal food systems?* **Jamaica:** *To what extent would more profitable rural enterprises be improved by integrated coastal zone and watershed management, and how might this provide a stronger basis for improving the sustainability and profitability of these enterprises in the light of increasing impacts of GEC?*

A further question was developed to address regional-scale issues: *How would Caribbean regional initiatives (e.g. CSME, FAOCCFP, CFPR) influence the effectiveness of policy and technical strategies aimed at reducing the vulnerability of food systems to GEC in Guyana and Jamaica?*

### Project Objectives:

**Objective 1:** *Improve national policy formulation capacity for food security and environmental management of selected food systems in Guyana and Jamaica.*

**Objective 2:** *Enhance adaptive strategies to reduce the vulnerability of selected food systems to GEC in Guyana and Jamaica*

**Objective 3:** *Improve capacity for policy formulation by regional institutions to reduce the vulnerability of national food systems to GEC.*

## SAC5/06/5: Caribbean research report and future plans

### GECAFS-Caribbean Science Plan and Implementation Strategy

**\*\*\* FIRST DRAFT \*\*\***

**6 April 2006**

Drafting Team:

Ronald Gordon, CARICOM Secretariat, Guyana  
John Ingram, GECAFS IPO  
Arvin Mosier, GECAFS IPO  
*Susan Singh-Renton, CRMF, St Vincent and the Grenadines*  
Adrian Rodriguez, IICA, Costa Rica  
Ranjit Singh, UWI, Trinidad & Tobago  
Adrian Trotman, CIMH, Barbados

#### Table of Contents

- 1 Caribbean Food Security and Global Environmental Change . Error! Bookmark not defined.Error!  
Bookmark not defined.**
  - 1.1 Caribbean food security, GEC and the policy context ... Error! Bookmark not  
defined.Error! Bookmark not defined.**
  - 1.2 GEC in the Caribbean ... Error! Bookmark not defined.Error! Bookmark not  
defined.**
  - 1.3 Integrating GEC science within regional development policy .....Error!  
Bookmark not defined.Error! Bookmark not defined.**
  - 1.4 Research challenges ..... Error! Bookmark not defined.Error! Bookmark not  
defined.**
- 2 Caribbean Research in the GECAFS Context ..Error! Bookmark not defined.Error! Bookmark not  
defined.**
  - 2.1 The need for a GECAFS Caribbean regional project .... Error! Bookmark not  
defined.Error! Bookmark not defined.**
  - 2.2 GECAFS-Caribbean project planning ..Error! Bookmark not defined.Error!  
Bookmark not defined.**
  - 2.3 GECAFS-Caribbean in relation to regional food security initiatives.....Error!  
Bookmark not defined.Error! Bookmark not defined.**
- 3 GECAFS-Caribbean Goal and Research Agenda .. Error! Bookmark not defined.Error! Bookmark  
not defined.**
  - 3.1 Goal ..... Error! Bookmark not defined.Error! Bookmark not defined.**

**SAC5/06/5: Caribbean research report and future plans**

- 3.2 Overarching GECAFS-Caribbean research questions and conceptual framework..... Error! Bookmark not defined.Error! Bookmark not defined.**
- 3.3 Research questions for food security and environmental management .Error! Bookmark not defined.Error! Bookmark not defined.**
  - 3.3.1 Vulnerability of food systems to GEC (re Q1) ..... Error! Bookmark not defined.Error! Bookmark not defined.**
  - 3.3.2. Adaptation (re Q1) .Error! Bookmark not defined.Error! Bookmark not defined.**
  - 3.3.3 Feedbacks (re Q3) .. Error! Bookmark not defined.Error! Bookmark not defined.**
- 3.4 Caribbean science in the context of GECAFS conceptual research .....Error! Bookmark not defined.Error! Bookmark not defined.**
  - 3.4.1 Research on vulnerability of food systems to GEC..... Error! Bookmark not defined.Error! Bookmark not defined.**
  - 3.4.2 Regional scenarios for GECAFS studies ..... Error! Bookmark not defined.Error! Bookmark not defined.**
  - 3.4.3 Decision support research ..... Error! Bookmark not defined.Error! Bookmark not defined.**
- 4 GECAFS-Caribbean Implementation Error! Bookmark not defined.Error! Bookmark not defined.**
  - 4.1 Specific Studies Error! Bookmark not defined.Error! Bookmark not defined.**
  - 4.2 Regional scientific networking and endorsing research .Error! Bookmark not defined.Error! Bookmark not defined.**
  - 4.3 Regional Synthesis and integration..... Error! Bookmark not defined.Error! Bookmark not defined.**
  - 4.4 Building science-policy interfaces ..... Error! Bookmark not defined.Error! Bookmark not defined.**
  - 4.5 Phased approach..... Error! Bookmark not defined.Error! Bookmark not defined.**
    - 4.4.1 Phase I implementation (1.5 years)..Error! Bookmark not defined.Error! Bookmark not defined.**
    - 4.4.2 Phase II implementation (2.5 years).Error! Bookmark not defined.Error! Bookmark not defined.**
    - 4.4.3 Phase III implementation (0.5 years)Error! Bookmark not defined.Error! Bookmark not defined.**
  - 4.6 Communications strategy .... Error! Bookmark not defined.Error! Bookmark not defined.**
  - 4.7 Capacity development ... Error! Bookmark not defined.Error! Bookmark not defined.**
  - 4.8 Linking GECAFS-Caribbean research with GECAFS international networks ..... Error! Bookmark not defined.Error! Bookmark not defined.**

## **SAC5/06/5: Caribbean research report and future plans**

- 4.8 Links to IGBP, IHDP & WCRP Core and ESSP Joint Projects.....Error!  
Bookmark not defined.Error! Bookmark not defined.**
  
- 5 GECAFS-Caribbean Funding Strategy and Governance ..... Error! Bookmark not defined.Error!  
Bookmark not defined.**
  - 5.1 Funding strategy and indicative budget. Error! Bookmark not defined.Error!  
Bookmark not defined.**
  
  - 5.2 Governance ..... Error! Bookmark not defined.Error! Bookmark not defined.**
    - 5.2.1 Regional Coordinating Committee ...Error! Bookmark not defined.Error!  
Bookmark not defined.**
    - 5.2.2 GECAFS-Caribbean regional coordinator.....Error! Bookmark not  
defined.Error! Bookmark not defined.**
    - 5.2.3 Institutional home ... Error! Bookmark not defined.Error! Bookmark not  
defined.**
  
- 6 Conclusions..... Error! Bookmark not defined.Error! Bookmark not defined.**
  
- Annex 1: Global Environmental Change and Food Systems (GECAFS): A summaryError! Bookmark not  
defined.Error! Bookmark not defined.**
  
- Annex 2: Caribbean Research and GECAFS Error! Bookmark not defined.Error! Bookmark not defined.**
  
- Annex 3: Acknowledgements ..... Error! Bookmark not defined.Error! Bookmark not defined.**
  
- Annex 4: Acronyms and abbreviations..... Error! Bookmark not defined.Error! Bookmark not defined.**
  
- Annex 5: References ..... Error! Bookmark not defined.Error! Bookmark not defined.**

**SAC5/06/6: Southern Africa research report and future plans****GECAFS regional research in Southern Africa**

1. The Southern Africa Science Plan and Implementation Strategy is completed (GECAFS Rpt 3). A strategy of establishing a regional fund is envisaged into which regional scientists can bid to deliver the Plan .This will need the establishment of a GECAFS Regional Coordinating Committee.
2. A multi-author paper or regional GEC/food security issues is near to submission to *Environmental Science and Policy*.
3. A proposal is in preparation to DANIDA to fund a GECAFS Scenarios exercise for Southern Africa.

Summaries of the Science Plan and Implementation Strategy and *ESP* paper are given below.

\*\*\*\*\*

**Global Environmental Change and Food Systems  
GECAFS Southern Africa Science Plan and Implementation Strategy**

Drafting Team:

Scott Drimie, South Africa; Pauline Dube, Botswana; Christo Fabricius, South Africa; John Ingram, GECAFS IPO; Reneth Mano, Zimbabwe; Charles Mataya, Malawi; Martin T Muchero, Zimbabwe; Elliot Vhurumuku, WFP/FAO

Table of Contents

Executive Summary.....	33
1 Southern African Food Security and Global Environmental Change <b>Error! Bookmark not defined.Error! Bookmark not defined.</b>	
1.1 Regional food security, GEC and the policy context <b>Error! Bookmark not defined.Error! Bookmark not defined.</b>	
1.2 Integrating GEC science within regional development policy <b>Error! Bookmark not defined.Error! Bookmark not defined.</b>	
1.3 Research challenges .....	<b>Error! Bookmark not defined.Error! Bookmark not defined.</b>
2 Southern Africa Research in the GECAFS Context <b>Error! Bookmark not defined.Error! Bookmark not defined.</b>	
2.1 The need for a GECAFS southern Africa regional project <b>Error! Bookmark not defined.Error! Bookmark not defined.</b>	
2.2 GECAFS-SAF project planning.. <b>Error! Bookmark not defined.Error! Bookmark not defined.</b>	
2.3 GECAFS-SAF in relation to regional food security initiatives <b>Error! Bookmark not defined.Error! Bookmark not defined.</b>	
3 GECAFS-SAF Goal and Research Agenda <b>Error! Bookmark not defined.Error! Bookmark not defined.</b>	

**SAC5/06/6: Southern Africa research report and future plans**

- 3.1 Goal..... **Error! Bookmark not defined.Error! Bookmark not defined.**
- 3.2 Overarching GECAFS-SAF research questions and conceptual framework **Error! Bookmark not defined.Error! Bookmark not defined.**
- 3.3 Research questions for food security and environmental management**Error! Bookmark not defined.Error! Bookmark not defined.**
  - 3.3.1 Vulnerability of food systems to GEC (re Q1)**Error! Bookmark not defined.Error! Bookmark not defined.**
  - 3.3.2 Adaptation (re Q2) ..... **Error! Bookmark not defined.Error! Bookmark not defined.**
  - 3.3.3 Feedbacks (re Q3) ..... **Error! Bookmark not defined.Error! Bookmark not defined.**
- 3.4 Southern African science in the context of GECAFS conceptual research... **Error! Bookmark not defined.Error! Bookmark not defined.**
  - 3.4.1 Research on vulnerability of food systems to GEC**Error! Bookmark not defined.Error! Bookmark not defined.**
  - 3.4.2 Regional scenarios for GECAFS studies**Error! Bookmark not defined.Error! Bookmark not defined.**
  - 3.4.3 Decision support research **Error! Bookmark not defined.Error! Bookmark not defined.**
- 4 GECAFS-SAF Implementation Strategy **Error! Bookmark not defined.Error! Bookmark not defined.**
  - 4.1 Case studies ..... **Error! Bookmark not defined.Error! Bookmark not defined.**
    - 4.1.1 Rationale for case study approach**Error! Bookmark not defined.Error! Bookmark not defined.**
    - 4.1.2 Selection criteria..... **Error! Bookmark not defined.Error! Bookmark not defined.**
    - 4.1.3 Implementation strategy for case studies**Error! Bookmark not defined.Error! Bookmark not defined.**
    - 4.1.4 Regional synthesis and integration**Error! Bookmark not defined.Error! Bookmark not defined.**
  - 4.2 Regional scientific networking and endorsing research**Error! Bookmark not defined.Error! Bookmark not defined.**
  - 4.3 Building science-policy interfaces**Error! Bookmark not defined.Error! Bookmark not defined.**
  - 4.4 Phased approach..... **Error! Bookmark not defined.Error! Bookmark not defined.**
    - 4.4.1 Phase I implementation (1.5 years)**Error! Bookmark not defined.Error! Bookmark not defined.**
    - 4.4.2 Phase II implementation (3.5 years)**Error! Bookmark not defined.Error! Bookmark not defined.**
  - 4.5 Communications strategy ..... **Error! Bookmark not defined.Error! Bookmark not defined.**
  - 4.6 Capacity development ..... **Error! Bookmark not defined.Error! Bookmark not defined.**
  - 4.7 Linking GECAFS-SAF research with GECAFS international networks ..... **Error! Bookmark not defined.Error! Bookmark not defined.**
  - 4.8 Links to IGBP, IHDP & WCRP Core and ESSP Joint Projects**Error! Bookmark not defined.Error! Bookmark not defined.**
- 5 GECAFS-SAF Funding Strategy and Governance**Error! Bookmark not defined.Error! Bookmark not defined.**
  - 5.1 Funding strategy and indicative budget**Error! Bookmark not defined.Error! Bookmark not defined.**
  - 5.2 Governance ..... **Error! Bookmark not defined.Error! Bookmark not defined.**
    - 5.2.1 Regional Steering Committee**Error! Bookmark not defined.Error! Bookmark not defined.**
    - 5.2.2 GECAFS-SAF regional coordinator**Error! Bookmark not defined.Error! Bookmark not defined.**
    - 5.2.3 Institutional home..... **Error! Bookmark not defined.Error! Bookmark not defined.**
- 6 Conclusions ..... **Error! Bookmark not defined.Error! Bookmark not defined.**

**SAC5/06/6: Southern Africa research report and future plans**

Annex 1 Global Environmental Change and Food Systems (GECAFS): A summary **Error! Bookmark not defined.**  
**Bookmark not defined.**

Annex 2 GECAFS-SAF project development.. **Error! Bookmark not defined.** **Error! Bookmark not defined.**

Annex 3 Research questions derived during GECAFS-SAF planning **Error! Bookmark not defined.** **Error! Bookmark not defined.**

Annex 4 Acknowledgements..... **Error! Bookmark not defined.** **Error! Bookmark not defined.**

Annex 5 Acronyms and abbreviations..... **Error! Bookmark not defined.** **Error! Bookmark not defined.**

Annex 6 References..... **Error! Bookmark not defined.** **Error! Bookmark not defined.**

## SAC5/06/6: Southern Africa research report and future plans

### Executive Summary

Social, economic and political factors are increasing food insecurity in southern Africa. Changes in the environment (Global Environmental Change, GEC) are further complicating what is already a food insecure situation for many.

A three-year consultation and planning exercise has identified the need for, and necessary components of, an integrated research endeavour on the links between southern African food security and GEC. The exercise, organised by the international research project Global Environmental Change and Food Systems (GECAFS), involved a diverse group comprising regional researchers, regional and international organisations and donors, and culminated in the preparation of this Plan for a GECAFS southern Africa project (GECAFS-SAF). Recognising and building upon ongoing national and regional GEC and food security research, the Plan provides a strategy to deliver policy-relevant information about the interactions between GEC and the food systems that underpin food security.

The goal of GECAFS-SAF is to determine strategies to cope with the impacts of global environmental change on southern African food systems and to assess the environmental and socioeconomic consequences of adaptive responses aimed at improving long-term food security.

GECAFS-SAF research will identify the social and geographical distributions of vulnerability of the region's food systems to GEC in the context of other stresses. Based on these new insights it will determine how, when and where adaptations to food systems to reduce their vulnerability to GEC can be instituted in line with long-term national and regional developmental goals. It will also assess the long-term social and environmental consequences of different adaptation measures adopted to enhance regional food security. In addition to addressing regional priorities, proposed research is also fully consistent with the international GECAFS conceptual and methodological research agenda and will be networked with other GECAFS research worldwide.

GECAFS-SAF will be implemented over five years via:

- (i) a few Case Studies across the region, each addressing the food systems questions relating to GEC vulnerability and impacts, adaptation options and feedbacks;
- (ii) Regional Scientific Networking, to link case study research with other relevant research in the region and internationally; and
- (iii) a Science-Policy Interface, linking national researchers with policymakers, the private sector, civil society and representatives of regional food security programmes.

Research will be organised into defined phases with clear outputs at each stage. When integrated, outputs will provide policy-relevant information at both local and regional levels with the communications strategy underpinned by stakeholder engagement at all research stages. Research capacity will be developed by collaborative research within the international GECAFS project.

A GECAFS-SAF Regional Fund will be established to cover case study research (via regional calls for proposals), regional networking activities, the science-policy interface and research management. A GECAFS-SAF Regional Steering Committee (RSC) will be established and a regional coordinator appointed. The RSC will provide scientific oversight of GECAFS-SAF and manage the Fund. The Regional Coordinator will be appointed and based in an appropriate institution with a regional mandate which will also administer the Fund.

The GECAFS Southern Africa Science Plan and Implementation Strategy offers an innovative and timely research framework on improving regional food security in the context of environmental stress. This is an issue of growing importance for the region.

**SAC5/06/6: Southern Africa research report and future plans**

GECAFS-SAF provides an integrated approach to food security and GEC research in southern Africa. It

- is based on a comprehensive set of research questions derived from wide regional consultation;
- directly addresses the stated information needs of regional policy and development agencies;
- builds on, and adds value to, existing research findings and infrastructure;
- networks researchers both regionally and internationally;
- contributes to an internationally endorsed research agenda; and
- proposes and justifies the establishment of a regional research fund, administered by an appropriate institution with a regional mandate.

GECAFS-SAF will contribute to a number of major food security initiatives in the region and support both local interests and those of major regional activities (e.g. COMESA, FARA, NEPAD and SADC-FANR). It will also constitute an integral component of the internationally-endorsed GECAFS agenda. Principal outputs will include:

- improved understanding of how GEC will additionally affect food security across the region and among different socioeconomic groups;
- assessments of how adaptation strategies designed to cope with GEC and changing demands for food will affect the environment, societies and economies;
- enhanced regional capacity in food security and environmental research;
- strengthened regional policy formulation capacity for food security and environmental governance; and
- policy recommendations for adaptation options.

## **SAC5/06/6: Southern Africa research report and future plans**

### **Paper outline for submission to *Environmental Science and Policy*.**

*Dynamic Challenges of Global Environmental Change to Food Security in Southern Africa*

*Proposed authorship:*

R.T. Mano<sup>a,\*</sup>, J. Arntzen<sup>b</sup>, S. Drimie<sup>c</sup>, P. Dube<sup>d</sup>, J.S.I. Ingram<sup>e</sup>, C. Mataya<sup>f</sup>, M.T Muchero<sup>g</sup>, E. Vhurumuku<sup>h</sup> and G. Ziervogel<sup>i</sup>

<sup>a</sup> Department of Agricultural Economics & Extension, University of Zimbabwe, P.O Box MP167, Mt. Pleasant, Harare, Zimbabwe

<sup>b</sup> Centre for Applied Research, PO Box 70180, Gaborone, Botswana

<sup>c</sup> 10 Rhodes Avenue, Parktown West, Johannesburg 2193, Gauteng, South Africa

<sup>d</sup> Department of Environmental Science, Faculty of Science, University of Botswana, P.B. UB 0704, Gaborone, Botswana

<sup>e</sup> GECAFS International Project Office, NERC Centre for Ecology and Hydrology, Wallingford, OX10 8BB, UK

<sup>f</sup> Bunda College, University of Malawi, Box 219, Lilongwe, Malawi

<sup>g</sup> MT Muchero Management Consultancy Services, PO Box MP556, Mount Pleasant, Harare, Zimbabwe

<sup>h</sup> World Food Programme, WFP/UN Place, PO Box 54, Gaborone, Botswana

<sup>i</sup> Department of Environmental & Geographical Science, University of Cape Town, Private Bag, Rondebosch 7701, South Africa

\* Corresponding author: *E-mail address:* [rtmano@mweb.co.zw](mailto:rtmano@mweb.co.zw)

## SAC5/06/6: Southern Africa research report and future plans

Abstract.....	Error! Bookmark not defined.Error! Bookmark not defined.
<b>1. Background and objectives of the paper.....</b>	<b>Error! Bookmark not defined.Error! Bookmark not defined.</b>
<b>2. The food security situation in Southern Africa .....</b>	<b>Error! Bookmark not defined.Error! Bookmark not defined.</b>
<i>Root causes of the Southern Africa food security situation.....</i>	<i>Error! Bookmark not defined.Error! Bookmark not defined.</i>
<i>The institutional and policy contexts and challenges.....</i>	<i>Error! Bookmark not defined.Error! Bookmark not defined.</i>
<b>3. Southern African Food Systems .....</b>	<b>Error! Bookmark not defined.Error! Bookmark not defined.</b>
<i>Food production .....</i>	<i>Error! Bookmark not defined.Error! Bookmark not defined.</i>
<i>Food distribution: road and rail.....</i>	<i>Error! Bookmark not defined.Error! Bookmark not defined.</i>
<i>Food storage and grain reserves .....</i>	<i>Error! Bookmark not defined.Error! Bookmark not defined.</i>
<i>Food imports and trade .....</i>	<i>Error! Bookmark not defined.Error! Bookmark not defined.</i>
<i>Food aid .....</i>	<i>Error! Bookmark not defined.Error! Bookmark not defined.</i>
<i>Food access and the increasing role of supermarkets .....</i>	<i>Error! Bookmark not defined.Error! Bookmark not defined.</i>
<b>4. Current and anticipated environmental conditions .....</b>	<b>Error! Bookmark not defined.Error! Bookmark not defined.</b>
<i>Current environmental conditions .....</i>	<i>Error! Bookmark not defined.Error! Bookmark not defined.</i>
<i>Anticipated GEC in Southern Africa.....</i>	<i>Error! Bookmark not defined.Error! Bookmark not defined.</i>
<b>5. Vulnerability of Regional Food Systems to Global Environmental Change .....</b>	<b>Error! Bookmark not defined.Error! Bookmark not defined.</b>
<i>Multiple stresses on food systems .....</i>	<i>Error! Bookmark not defined.Error! Bookmark not defined.</i>
<i>GEC as an important further stress affecting Southern African food security</i>	<i>Error! Bookmark not defined.Error! Bookmark not defined.</i>
<b>defined.</b>	
<b>6. Potential technical and policy approaches and constraints for enhancing Southern African food security in relation to GEC</b>	<b>Error! Bookmark not defined.Error! Bookmark not defined.</b>
<i>Increasing food production.....</i>	<i>Error! Bookmark not defined.Error! Bookmark not defined.</i>
<i>Improving food storage and distribution .....</i>	<i>Error! Bookmark not defined.Error! Bookmark not defined.</i>
<i>Improving intra-regional trade.....</i>	<i>Error! Bookmark not defined.Error! Bookmark not defined.</i>
<i>Improving food access and utilisation .....</i>	<i>Error! Bookmark not defined.Error! Bookmark not defined.</i>
<b>8. The need for a regional policy perspective and associated research challenges.</b>	<b>Error! Bookmark not defined.Error! Bookmark not defined.</b>
<i>Importance of a regional policy perspective.....</i>	<i>Error! Bookmark not defined.Error! Bookmark not defined.</i>
<i>Research needs in the context of regional policy formulation.....</i>	<i>Error! Bookmark not defined.Error! Bookmark not defined.</i>
<b>9. Conclusions .....</b>	<b>Error! Bookmark not defined.Error! Bookmark not defined.</b>
<i>Acknowledgments .....</i>	<i>Error! Bookmark not defined.Error! Bookmark not defined.</i>

## **SAC5/06/6: Southern Africa research report and future plans**

*References* ..... Error! Bookmark not defined.Error! Bookmark not defined.

## SAC5/06/7: ESF/COST Forward Look on European Food Systems in a Changing World

### European Food Systems in a Changing World Plans for an ESF/COST Forward Look during 2006/07

*European Science Foundation “Forward Looks” enables Europe’s scientific community to develop medium to long term views and analyses of future research developments in multidisciplinary topics; and to interact with the policy makers from ESF Member Organisations. The aim is to bring together scientific foresight and national and European planning for ca. 10 year research funding strategies.*

#### Abstract

Food security is a primary societal goal in which food systems play a pivotal role. European food systems are changing, driven by complex technological and policy factors including CAP reform and GEC. These changes will affect the interactions between food availability, food access and food utilisation in uncertain ways. In addition to providing safe and healthy food, European food systems also contribute to an increasing number of goals including environmental functions and landscape and society objectives. This Forward Look will focus on how the changes in Europe’s food systems drivers, in the context of balancing the varied goals, and will affect these interactions.

#### Summary

Food security is a primary societal goal<sup>3</sup>, and is underpinned by food systems (FS). FS comprise a number of *activities* related to food production and preservation; food processing and packaging; food distribution and retail; and food consumption. In addition to underpinning food security, these activities give rise to a number of other *outcomes* many of which contribute to and influence other societal goals such as employment, health and social and environmental conditions. Both the activities and the outcomes are influenced by a range of interacting *drivers*, but they also feedback directly and indirectly to modify the drivers themselves (figure 1).

Setting best food policy given the many uncertainties is difficult, and a scenario-based approach would help by analysing implications of policy and management options within a set of coherent, internally-consistent storylines of plausible futures at the European scale. Taking a long-term (25-40 year) perspective in addressing European FS is important, as many key uncertainties are likely to play out strongly over the coming decades – yet responding to these uncertainties already today may reduce future impacts and costs substantially.

Much research has been conducted on technical and policy issues for agriculture, fisheries and feed/ food in both social and natural sciences. This has generally been of a disciplinary nature, addressing specific aspects of FS activities and sub-components of their outcomes as contributing to food security (bullet points in Figure 2). The *interactions* between key sub-components of food security outcomes (arrows in Figure 2) are however insufficiently researched. Improved understanding of these interactions, and how changes in the drivers will affect them, is crucial in being able to address the higher-order issues relating to the food security and the tradeoffs debates. This is because many of the sub-components are themselves linked to both drivers and other FS outcomes.

---

<sup>3</sup> Food security is defined as: *when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life* (World Food Summit, 1996).

## SAC5/06/7: ESF/COST Forward Look on European Food Systems in a Changing World

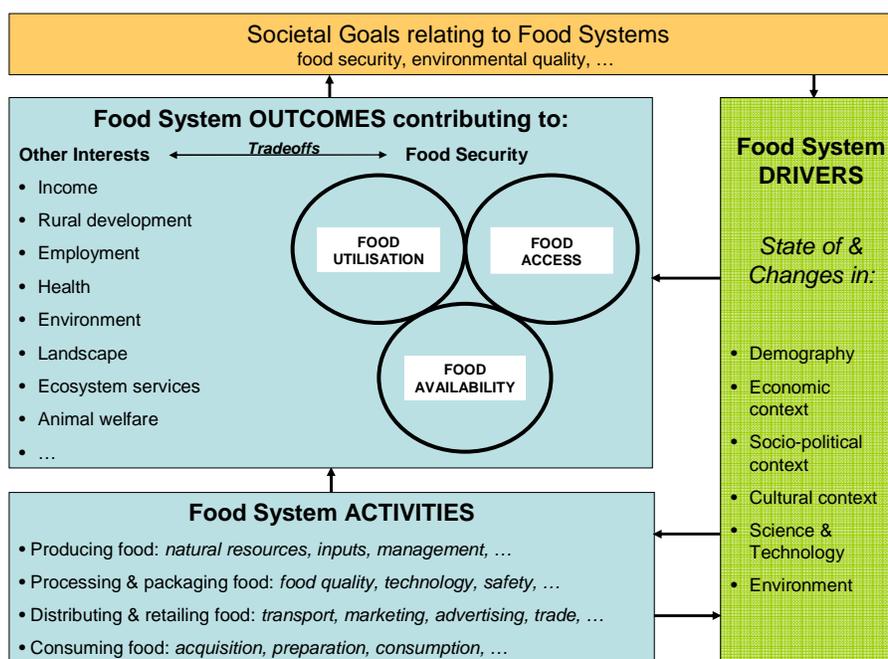


Figure 1

Two critical questions for policy, research and society at large are:

- 1) How will the drivers and interactions between them change in coming decades (especially given the additional growing importance of GEC)? and
- 2) How will these changes affect the interactions and conflicts between the sub-components relating to food *availability, access* and *utilisation*?

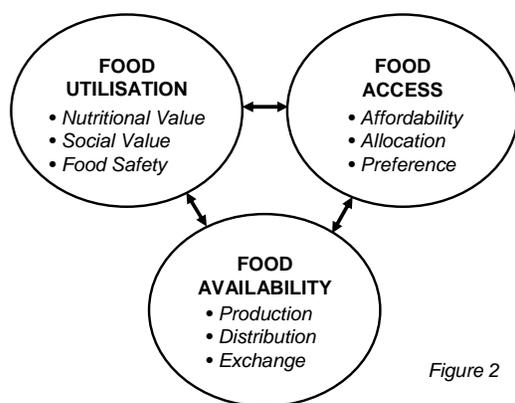


Figure 2

Research in coming years must address these questions in depth, but it is crucial to identify some of the key issues at this stage so as to map out a clear science agenda closely linked to the needs of policy formulation. This will best be done in the context of plausible *scenarios* of future conditions. The scenarios approach is increasingly being used in planning and policy formulation. It can be based on “exploratory” or “anticipatory” (normative) scenarios. The former approach has been widely used by the Millennium Ecosystem Assessment (for example) to determine how the outcomes of given pathways affect environment and other areas of interest. The alternative approach is advocated

for this FL as it will allow alternative pathways to either “utopian” or “dystopian” specified outcomes to be considered. This will help to determine and analyse the technical and policy options of potential “best/worst practise” resulting in either of these two states. The FL would make use of, and where necessary expand upon, existing European-scale forward-looking studies such as, for example, agricultural projections by DG AGRI, FAO and EEA; EEA’s land use scenarios (PRELUDE) and European Environment Outlook; and WUR/RIVM Eururalis. It would combine, as appropriate, model-based assessments with qualitative knowledge of stakeholders and decision-makers to ensure that the entire food system is addressed in an integrated manner.

## SAC5/06/7: ESF/COST Forward Look on European Food Systems in a Changing World

The range of science issues identified in Figure 2 is very broad. Rather than attempting to address all science pertaining to the sub-components *per se*, the FL will concentrate on the **interactions** between them. This not only provides focus, but will also engender the necessary interdisciplinary debate to explore new science questions. The FL will therefore undertake a systematic analysis of the interactions between all combinations of sub-components shown in figure 2 based on (i) current conditions, and (ii) in the context of plausible futures (scenarios).

### Proposed outputs

*“Traditional” science products*, in the form of multi-authored papers stemming from the two workshop and scenarios exercise, would be submitted to leading journals. Summary papers presented at the final Conference could be published in the ESF Forward Look Report Series for circulating to ESF Member Organisations and other interested bodies.

*Set of prototype scenarios* specifically designed to address European food and food policy issues. These would be published for dissemination to DGs, EEA and other European agencies and the GEC community.

*Awareness raising exercises* aimed at the policy community and designed to enrich the debate between science and policy in the food area. These would include presentations to meetings of European Ministers for Agriculture, Environment, etc; and Policy Briefs for senior managers in DGs, EEA and other European agencies.

*Proposals for follow-up activities* using ESF and COST instruments such as ESF Research Conferences, COST Actions, etc.; and the possibility of establishing an ESF/COST Expert Board to address food system issues to help delineate European policy.

### Organising Cmmtt

Rudy Rabbinger, Wageningen University, Netherlands [Co-Chair]  
Peter Raspor, University of Ljubljana, Slovenia. [Co-Chair]  
Chris Godwin, Economic and Social Research Council, UK  
Jan-Willem Grievink, Erasmus Food Management Institute, Netherlands  
Thomas Henrichs, Copenhagen  
Paul Holm, University of Southern Denmark, Denmark  
John Ingram, Natural Environment Research Council, UK  
Begoña Pérez-Villarreal Fundación AZTI, Spain  
Sally Shortall, Queens University Belfast, UK

## SAC5/06/7: ESF/COST Forward Look on European Food Systems in a Changing World

### ANNEX: Detailed budget (€) for Forward Look on FoodSystems

Task	Timing	Budget
<b>Kick-Off OC meeting</b>	Mar 2006	3 k
<p><b>4 Concurrent Stakeholder Roundtables (i.e. 1 per FS activity)</b></p> <p><i>Aim: Arrive at a better understanding of European Food System, and current challenges different actors/stakeholders face.</i></p> <p>Input to discussion:            (a) Short paper 'What are Food Systems' (Ericksen, 2006)            (b) Short paper 'Challenging views of the future' (FL chairs)</p> <p>Key issues for discussion:            (a) What are the key drivers of each food system activity?            (b) How does each set of food system activities affect the food security outcomes and interactions between them?            (c) What are the main challenges facing this set of actors?</p>	Jun 2006	32 k
<p><b>Background paper 'Inventory of current European scenarios'</b></p> <p><i>Aim: Provide a basis and a reference for scenario development and analysis within this Forward Look</i></p>	Sep 2006	5 k
<p><b>Workshop 1 - Current food system interactions</b></p> <p><i>Aim: To identify those food system components and interactions to focus on. To initiate the scenario exercise by identifying focal question and key uncertainties.</i></p> <p>Input to discussions:            (a) Roundtable outputs            (b) Background paper 'Inventory of current European scenarios'</p> <p>Key issues for discussion:            (a) Identify key interactions between components of FS Outcomes to be addressed in 3 x FS interactions papers for <i>current</i> context            (b) Identify principal uncertainties regarding plausible future developments (i.e. drivers, activities, outcomes), thus framing the focus of scenarios; &amp; Maybe even design and agree upon scenario logics (providing the basis for work following the workshop)</p>	Sep 2006	35 k
<p><b>Mid-term OC meeting</b></p> <p><i>Aim: To review progress, agree on papers to be commissioned, decide on scenario exercise.</i></p>	Oct 06	5 k
<p><b>3 Papers 'Food System Interactions in Europe'</b></p> <p><i>Aim: To assess prime food systems interactions, both within current and plausible future contexts.</i></p> <p>Stage A: Description of current dynamics and interactions            Stage B: Assessment of plausible future developments based on scenarios (to be drafted after Workshop 2)</p>	Mar 07 Jun 07	24 k (8k each)

## SAC5/06/7: ESF/COST Forward Look on European Food Systems in a Changing World

<p><b>Develop scenarios for European food systems</b></p> <p><i>Aim: To develop a set of scenarios (based on key uncertainties) which provide a backdrop for discussion on future food system interactions</i></p> <p>Detailed approach:          10-12 participants (from science and stakeholder groups)          2 workshops a 3 days (Dec 06 and Feb 07 -- ca 40k)          Supporting work and scenario drafting (ca 20k)</p> <p>Output:          A set of general food system scenarios, that provide a backbone for more detailed assessment of interactions. These scenarios will be qualitative and narrative in nature, span up to 2050 and aim to look outside the current constraints of food systems. It is not aimed to quantify assumptions, but general consistency and plausibility will be assured through expertise of participants.</p>	Mar 07	60 k
<p><b>Workshop 2: Future food system interactions</b></p> <p><i>Aim: Based on scenario exercise and description of current food systems and interactions assess possible future developments</i></p> <p>Input to discussions          (a) Draft scenarios          (b) Commissioned papers Stage A</p> <p>Key Issues for discussions          (a) Familiarise, Review and Finalise scenarios          (b) Build on FS interactions papers and discuss <i>future</i> context</p>	Apr 07	35 k
<p><b>Final Conference and Proceedings</b></p> <p><i>Aim: To conclude project, initiate further scientific debate, set the scene for a special issue of journal or final report.</i></p> <p>Inputs: Roundtable reports, Final scenarios, Papers on Food systems</p>	Sep 07	50 k
<p><b>Communication</b></p> <p><i>Aim: To communicate results back to the policy domain (not as report) – options: video clip, interactive website, brochure, etc</i></p>	Sep 07	8 k
<p><b>Reporting at Ljubljana Conference 2008</b></p> <p><i>Aim: Delegation of leading FLook participants to report final outcomes of FLook to full Conference using materials developed in Communication package</i></p>	Early 08	8 k
<p><b>Buffer</b></p> <p><i>Aim: To have funds at hand for conference attendance relevant to project</i></p>		5 k
<p><b>Project Administration (i.e. 10% of total budget)</b></p>		30 k
<p><b>Total</b></p>		<b>300 k</b>

**SAC5/06/8: ESF / COST workshop on research agenda setting****Determining environmental information needs for improved policy formulation**

Initial Plans for a

COST-TCE / COST-TCSSH / ESF-LESC / ESF-SCSS Exploratory Workshop

*5 May 06 version*

Environmental policy formulation needs to be based on best science and understanding, but how is the science agenda best set, and by whom?

Research related to improved environmental management has to be made in relation to policy formulation and decision-making. This needs a greatly enhanced collaboration between scientists, private sector decision-makers and the policy-making community. Decision Support Systems (DSS) are able to assist in this by providing a platform for dialogue between science and policy. In addition to decision support tools such as simulation models, DSS development will also include interpretation and “delivery” mechanisms for discussion with policy makers, resource managers and other stakeholders. As the early engagement of these decision-makers in DSS development is vital, DSS development needs to build on research on how best to determine stakeholder information needs, and on communicating and interpreting output. This can be developed on the ‘co-production of knowledge’ approach whereby stakeholders engage with the formulation of the research question before it has been defined in detail, and then work within the research project.

Environmental science research proposals often state that the work will be of value to policy makers. While this will hopefully be the case in many instances, the assumption may often not be valid for a number of reasons. First, the scientist may not be aware of policy priorities at any given time and the perceived importance of the research is in fact low on the policy agenda. Second, policy makers may not be aware of a rising scientific issue, and are not adjusting their priorities in line with latest findings. Third, scientific output is often not policy-maker friendly. In order to establish science agendas which are more likely to be of policy interest and assist in decision support, it is important to improve communication between the science community and those working in the policy and resource management communities, and other end-users.

A recent UK Scientific Alliance/NERC Seminar noted that only a few people work specifically on communicating the science to policy-makers. While more specialists in this important area would obviously be of benefit, the task itself would be made the easier if better understanding of communication methods were available to help set science agendas, and if both scientists and end-users were aware of latest research in communications techniques.

A workshop will review ongoing European research in science-policy communications, and to determine how best to further develop this important research agenda. Key aspects to consider include key aspects of policy formulation and science agenda setting, designing and conducting stakeholder interviews, use of multi-media techniques and communications theory. To give a focus to the meeting, workshop presentations and discussions will be centred on how best to ascertain information needs relating to the nitrogen cycle, the subject of much current environmental research. In addition to advancing the research process in general, workshop output will therefore contribute to enhanced communications of nitrogen management research.

## **SAC5/06/8: ESF / COST workshop on research agenda setting**

### *Workshop questions:*

Within the general theme of “How can the science-policy dialog be enhanced to the mutual benefit of science and policy communities?”, specific questions are:

1. How robust are existing paradigms of the science/policy interface for developing improved communication and what are key elements of good and bad practice?
2. How can research on science-policy communications be enhanced so as to deliver better understanding of information needs in the context of science and policy agendas?
3. How can improved understanding of communications be incorporated into discussion- and decision-support systems?

### *Workshop format (2-day meeting):*

2-3 introductory papers on general issues/examples of good and bad practice.

Series of working groups to address each question.

### *Possible outputs:*

- Overview of different approaches to determining information needs (maybe a multi-author paper)
- Proposal to develop a joint COST TCE-TCHSS Action.
- Proposal for further joint COST-ESF work in this area
- Improved collaboration with international research on DSS, e.g. through links to GECAFS DSS research.

The 2-day meeting will be held in the first half of 2006 (in either Austria or in the COST Office, Brussels) and will involve about 30 people including communications theoreticians and researchers in interactive agenda-building, science communicators, policy-makers and environmental and risk assessment scientists. Some non-Europeans would be invited to give key-note papers.

The approved budget of €50k will be equally shared by each of the four committees.

*John Ingram*  
*Chair, COST TC Environment*

**SAC5/06/8: ESF / COST workshop on research agenda setting****Initial Organising Cmmtt:**

COST TC Env: John Ingram, TC Env Chair, DC ESSEM (UK) [Chair]  
 ESF-LESC: Alex Quintanilha, LESC Chair (Portugal)  
 ESF-SCSS: Slavko Splichal, SCSS member (Slovenia)  
 COST TC SSH: Chris Godwin, TC SSH Chair, DC ISCH (UK)

**Interested parties (as of 08 May):*****European***

Elizabeth Shove, Lancaster Univ  
 John Marks (re European network of environmental research advisory councils)  
 AIRNET Bert Brunekreef (IRAS NL) <http://airnet.iras.uu.nl/>  
 PINCHE, Policy Interpretation Network on Children's Health and Environment Peter Van den Hazel (NI) <http://www.pinche.hvdgm.nl/>  
 Martina Hartl, Federal Ministry of Education, Science and Culture, Department of Social Sciences, Austria (TC SSH / DC ISCH)  
 John Holmes, University of Oxford, Dept of Earth Sciences, +44 1865 272 058  
[john.holmes@earth.ox.ac.uk](mailto:john.holmes@earth.ox.ac.uk)  
 Jan Willem ERISMAN, Chair COST 729, Energy Research Centre of the Netherlands (ECN), P.O. Box 1, 1755 ZG Petten Netherlands Tel. +31 224 564155, Fax. +31 224 568488, [erisman@ecn.nl](mailto:erisman@ecn.nl)  
 Sylvain Joffre, COST Met-EEA, [sylvain.joffre@fmi.fi](mailto:sylvain.joffre@fmi.fi)  
 Eduarda Gonçalves, Portugal  
 Sheila Anderson, NERC  
 David Guy, ESRC  
 Professor Joanna Iliopoulou, University of Patras, Department of Biology  
[J.iliopoulou@upatras.gr](mailto:J.iliopoulou@upatras.gr)  
 Julius Court, Overseas Development Institute (London)  
 Mark Holderness, CAB International (London)

***International groups***

NAS Washington DC (Rich Bissell, Executive Director, Policy and Global Affairs)  
 Inter American Institute for Global Change research (IAI), c/o INPE, Brazil  
 Arvin Mosier, Univ Florida  
 Greg Kiker, Univ Florida  
 Mike Brklacich, Carleton Univ, Canada  
 Ula Loew, IHDP Communications Unit (Bonn)  
 ICSU rep  
 Gabriele Bammer, ANU

***Notes:***

*WS would be a valuable input to GECAFS DS project, so aim to have GECAFS co-sponsor. This helps internationalise event, showcasing European work. Also helps with links to IAI, US, Canada, Australia etc..*

**SAC5/07: Feedback from IGBP SC, IHDP SC and WCRP JSC meetings**

Feedback from February / March 2006 IGBP SC, IHDP SC and WCRP JSC meetings

**1. Partnerships with Core Projects and with other ESSP Joint Projects and Integrated Regional Studies (IRS)**

One of GECAFS' original Guiding Principles was that "the project must draw together and build on relevant aspects of each Sponsoring Programmes' Core Projects and, by linking these with appropriate inputs from other organisations, set these in a broader context of coupled human-environment systems".

GECAFS has already benefited from interaction with several Core Projects (principally CLIVAR, GCTE, GECHS, GLOBEC, IDGEC, IT, LUCC) and plans are in place to work more closely with other ESSP Joint Projects. These other projects are however busy with their own agendas and may not see the immediate benefit of collaborations with GECAFS. Nevertheless, both to benefit from the core sciences in the projects, and in the spirit of the Guiding Principle, GECAFS needs to be clearer at the SC/JSC meetings on what it needs from the other projects. The hope is that this could in turn benefit the other projects by helping them identify new areas of specialist research and set such work "in a broader context of coupled human-environment systems".

The emerging IRSs (e.g. Monsoon Asia Integrated Regional Studies, MAIRS) could be encouraged to develop GECAFS-type studies, whilst indicating that GECAFS will support - not drive - these, at least initially. This might involve a moderately aggressively marketing of GECAFS' scenarios and other methodology, so that at least the regional studies that might be conducted under IRSs use similar methodologies. This might just mean encouraging some of their interested members to attend GECAFS workshops, etc.

**The SAC is asked to: advise on specific inputs GECAFS should request from Core/Joint Projects and IRS.**

**2. Emergent global properties due to accumulation of local/regional effects related to food systems**

The GECAFS strategy thus far has been to establish a small number of contrasting regional projects, and not to set up multiple regional projects that "summate" to give global coverage. But GECAFS does however need to be clearer about its niche in dealing with issues which would not be synthesised at the global scale through any other means. At first sight GECAFS seems anomalous in this compared to the other Joint Projects which are generally tackling issues at global scale and/or world-wide coverage (although several aspects of GECAFS Conceptual research are generic). The question is whether/how GECAFS should be discussing and marketing the fact that there are global emergent issues arising out of the GECAFS studies, even if these are not as high a priority as the conceptual research and regional projects *per se* at this stage.

**SAC5/07: Feedback from IGBP SC, IHDP SC and WCRP JSC meetings**

For example, it could hypothetically be optimal at the individual regional level for many regional food systems to switch to niche markets or biofuels, with the implication that they all expect to obtain staples from somewhere else and/or there is a change in food security within different social groups within the given region. The global emergent outcome would be shortages of staples generally and changes in food security.

As noted above, such changes could have global (not just regional) implications if many regions followed this route, all assuming that staple foods were going to come from somewhere else. Are there other non-GEC global drivers that it is important to consider in all regions, in order to be able to discuss their global emergent impacts later (which of course alter their real value in regional scenarios in a truly global context)? There are other (possibly more subtle) examples, e.g. emergent global issues in the use of water or fertiliser, or even the movement of people into cities to the point where there is insufficient rural labour to provide the needed urban food supplies.

As a facet of the foregoing point, it is not only what we would think of as GEC factors that might interact with multiple regional food systems to create global outcomes. Currently the regional studies concentrate (appropriately) on how GEC factors will interact with other global factors that impact on regional scenario outcomes. There are other types of global drivers that should be universally considered in the regional studies also. The GECAFS Scenarios research is encompassing this to some extent, but it might be helpful to collect a list of global (non-GEC) drivers that might be important to get a widespread view on, especially where (i) they might be of particular interest to other ESSP elements (thereby enhancing collaboration) and (ii) may have a feedback on food systems themselves, as opposed to GEC *per se*. GECAFS should ensure regional studies include these in their analysis by way of appropriate scenarios developments.

Emergent global implications of the regional food systems work warrant consideration. Further, thinking a little about these issues now may help identify some aspects of the regional work which would help to ensure that the global implications can later be drawn.

**The SAC is asked to: advise on whether/how GECAFS should handle “emergent global properties”.**

**SAC5/08: Partnerships with CGIAR, FAO and WMO****GECAFS Strategic Partnerships with CGIAR, FAO & WMO**

One of GECAFS' original "Guiding Principles" was that the project's role vis à vis other international research bodies and UN agencies must be clear, and that appropriate strategic partnerships should be established from an early stage.

Prior to the establishment of the Scientific Advisory Committee, the GECAFS Executive Committee agreed that appropriate initial partners for the GECAFS agenda would be the CGIAR, FAO and WMO. Discussions with all three bodies were positive and a formal relationship established with each. While the nature of the "paperwork" was different in each case, all agreed to collaborate to mutual benefit and that GECAFS could use the logos of each organisation on its promotional materials. A key aspect in each case was that the agreements should not imply any financial relationship on either party. All three bodies agreed to nominate a representative to sit on the GECAFS Scientific Advisory Committee and all were represented at the inaugural SAC meeting in April 2002.

From the GECAFS viewpoint, all these partnerships have proved very useful both in advancing the science and in the fact that donors are encouraged by the overt and proactive effort GECAFS has made to bridge the gap between the GEC research community and organisations more closely linked with the development agenda.

**CGIAR: Key benefits to GECAFS:**

- i) membership of the Inter-Center Working Group on Climate Change (chaired by Denis Garrity) since its inception, which has allowed contact (albeit sporadic) to be maintained with CC aspects in all CG centres.
- ii) contacts in the Challenge Program on Water and Food, which has clarified grant application processes.
- iii) links to IFPRI research in the IGP, which has helped to identify regional researchers and links to government departments and to pave the way for GECAFS/IFPRI combined activities in the region.

**FAO: Key benefits to GECAFS:**

- i) active and very effective collaboration between the FAO/MA scenarios group and GECAFS scenarios activities.
- ii) facilitation in hosting meetings in FAO HQ in Rome.
- iii) introductions to FAO regional activities in the Caribbean.
- iv) sustained intellectual input by senior FAO personnel in strategic planning of scenario and vulnerability research.

## **SAC5/08: Partnerships with CGIAR, FAO and WMO**

### **WMO: Key benefits to GECAFS:**

- i) endorsement of WCRP co-sponsorship of GECAFS.
- ii) an umbrella under which to approach organisations such as the CIMH when soliciting collaboration.
- iii) lobbying USDA for continued funding of the GECAFS DSS Science Officer post.
- iv) future collaboration with Commission for Agricultural Meteorology on regional projects.

In 2004 UNEP approached GECAFS seeking the establishment of a formal partnership, but a follow-up by GECAFS in early 2005 went answered.

### **The SAC is asked to advise on:**

- i) the value of these strategic partnerships and whether they should be further developed.
- ii) the value of re-opening negotiations with UNEP.
- iii) the value of exploring strategic partnerships with any other major international organisation.

**SAC5/10: Confirmed and Potential GECAFS Awards****Confirmed and Potential GECAFS Awards (\$k)**  
(Correct at 01 May 06; £1 = US\$1.80 = €1.45)**Table 1: Confirmed Core Funding**

Source	Purpose	Duration	Amount	\$ Equiv
IGBP/IHDP/WCRP	Project Management	2006	\$37	37
UK-NERC	IPO Staff, Travel and IPO costs	2006-2008	£354	637
UK-ESRC	Vulnerability Science Officer Post in IPO	2006-2007	£38	68
<b>Total</b>				<b>742</b>

**Table 2: Confirmed Project Funding**

Source	Purpose	Duration	Amount	\$ Equiv
CPWF	IGP Food System Descriptions Methods	2005/06	\$100	100
APN	IGP GEC Impacts Study (to NWCF, Nepal)	2006/07	\$180	180
ESF/COST	European Scenarios research	2006	€65	81
<b>Total</b>				<b>361</b>

**Table 3: Core Funding Proposals Submitted or in Preparation**

Source	Purpose	Duration	Amount	\$ Equiv
UK-DEFRA	Decision Support Science Officer in IPO	2006-2008	£90	180
<b>Total</b>				<b>180</b>

**Table 4: Project Funding Proposals Submitted or in Preparation**

Source	Purpose	Duration	Amount	\$ Equiv
USAID	Caribbean research	2006/09	\$768	768
UK-DFID	IGP Scenarios research	2006/07	£75	75
Danida	SAF Scenarios research	2006/07	\$150	150
<b>Total</b>				<b>993</b>

**The SAC is asked to: Note the confirmed and potential GECAFS funding.**

**SAC5/11/1: ESSP OSC Beijing November 2006*****Environmental Change: Regional Challenges***

**An Earth System Science Partnership  
Global Environmental Change Open Science Conference**

**9-12 November 2006**

**Beijing, China -  
Beijing International  
Convention Center**

**Plenary Sessions: Day 2 had the GECAFS / Food talk**

1. GEC Overview and Earth System Science: Progress and Challenges
2. Earth System Science in a Societal Context: The Need for Inter-Disciplinary Approaches:  
**Friday 10 Nov, Day 2**  
**Moderator - W. Steffen (Australia)**
  - a. **Water** - F. Lansigan (GWSP)
  - b. **Carbon** - M. Raupach (GCP)
  - c. **Food** - D. Liverman (GECAFS)
  - d. **Health** - T. McMichael (GECHH)
3. GEC Science Links with Policy and Development Agendas
4. Regional and Global Challenges and the Future of the ESSP.

**Key parallel sessions for GECAFS**

16	Comparative Governance of Carbon, Water and Food	L. King and H. Schroeder	Institutional dimensions, carbon, water, food.
18	Institutions for Sustainable Resource Management and Livelihood Security in Asia	B. Shabaz	Asia, decentralization, global change, institutions, institutional changes, livelihoods, natural resource management, participation, state policies, trade liberalization.
19	Global Environmental Change and Food Security in Africa	P. Dube	The influence of GEC on key elements in food security in Africa; information needs for decision makers and policy responses required to address effects of GEC on food security and long term feedbacks.
31	Building Bridges: Global Environmental Change and Development Aid	T. Rosswall and M. Leinen	Global environmental change and development aid, common agenda, sustainable and resilient livelihoods, regional scale research, adaptation and mitigation strategies, science-policy dialog.

*# 31 includes an invited paper “GECAFS: Global Change and Food Systems - bringing global change research to the regions in a policy context” – Ahsan Ahmed (nominated)*

**SAC5/11/2: GECAFS Conference April 2008****Plans for a GECAFS Conference****April 2008, Oxford**

There is growing concern that Global Environmental Change (GEC) will further complicate achieving food security, particularly for more vulnerable sections of society. There is also concern that meeting society's rising demand for food will further degrade the environment. This may, in turn, further undermine the food systems upon which food security is based. These issues have been the subject of an increasing literature over the last decade and two major UK conferences (Oxford<sup>4</sup>, 1996 and Reading<sup>5</sup>, 1999).

The Reading Conference called for the establishment of a new research approach to directly address the links between food security (rather than just food production) and the environment. To this end "Global Environmental Change and Food Systems" (GECAFS: [www.gecafs.org](http://www.gecafs.org)) was established as an international, interdisciplinary research project focussed on understanding the links between food security and global environmental change. GECAFS was launched in 2001 as a Joint Project of the International Geosphere-Biosphere Programme (IGBP), the International Human Dimensions Programme on Global Environmental Change (IHDP) and the World Climate Research Programme (WCRP). In addition to setting an comprehensive, interdisciplinary GEC research agenda, GECAFS established, from the outset, formal research partnerships with the Consultative Group on International Agricultural Research (CGIAR), the UN Food and Agriculture Organization (FAO) and the UN World Meteorological Organization (WMO). This innovative arrangement brings together major international research bodies dealing with basic GEC science on one hand (IGBP, IHDP & WCRP) and those dealing with more applied aspects (CGIAR, FAO and WMO). It also brings the science funding and development agencies together to address a common agenda. This novel research partnership is providing new insights into both "science-policy interfaces" and "science-for-development".

The GECAFS goal is to determine strategies to cope with the impacts of global environmental change on food systems and to assess the environmental and socioeconomic consequences of adaptive responses aimed at improving food security. GECAFS undertakes research that not only studies food security in the context of GEC but also feedbacks of adaptation strategies to the Earth System.

GECAFS addresses three major questions of interest to science, development and society:

1. How will global environmental change affect the vulnerability of food systems in different regions?
2. How can we adapt food systems to cope with global environmental change and improve food security?
3. How will various adaptation options feedback on environmental and socioeconomic conditions?

---

<sup>4</sup> Climate Change and World Food Security. 1996. NATO ASI Series Series I. Springer. 662p.

<sup>5</sup> Gregory PJ and JSI Ingram (Eds). 2000. Food and Forestry: Global Change and Global Challenges. *Agriculture, Ecosystems and Environment* Special Issue **82**, 1-394.

## SAC5/11/2: GECAFS Conference April 2008

To answer these questions, GECAFS is developing a worldwide portfolio of interdisciplinary conceptual and methodological research closely linked to a set of regional projects. The conceptual and methodological research employs international research networks. They bring together and synthesise relevant, high-quality research from around the world to improve understanding on four key topics: food systems concepts; food system vulnerability; scenarios; and decision support: to determine how best to improve dialogue between scientists and policy-makers on environment and food issues. Regional research consists of a few regionally-based projects representing a range of major GEC issues and food systems with initial projects in the Indo-Gangetic Plain; in the Caribbean; and in Southern Africa.

### The need for a GECAFS Conference

The last few years have seen heightened concerns about the nature and magnitude of GEC. The media reports new, climate-related events on an almost weekly basis: rapid melting of the Greenland Ice Sheet; potential changes in the North Atlantic Conveyor; major floods (as in Guyana this January); droughts (as currently deepening in the Horn of Africa); and the continued aftermath of Hurricane Katrina. The need for adaptation strategies for food security are increasingly high on the political, science and development agendas.

The interdisciplinary GECAFS approach is increasingly being seen by researchers, policy makers, resource managers and donors as an innovative and effective way of developing environmental research – and particularly regarding global environmental change – in the context of food security. This clear science-society link is attracting specific interest in terms of policy formulation and the development agenda, and is rapidly building a wide community of academics and policy makers. In the 4 years since its launch, GECAFS has directly involved in excess of 500 people from over 50 countries research products are increasingly emerging, including a series of papers envisioned for *Environmental Science and Policy* (the first regarding the Indo-Gangetic Plain has already been published<sup>6</sup>, and a second on southern Africa<sup>7</sup> and third on the Caribbean are envisaged during 2006. By 2008 it is expected that a large and wide-ranging set of science and policy products will be available, and an international conference would be the most effective way to discuss and promote these products within both academia and policy and development communities.

### The Conference

The Conference will be held in Oxford, UK, thereby enabling interaction with the numerous environmental and policy-related bodies associated with the University. The academic host

---

<sup>6</sup> Aggarwal, PK, PK Joshi, JSI Ingram and RK Gupta. 2004. Adapting Food Systems of the Indo-Gangetic Plains to Global Environmental Change: Key Information Needs to Improve Policy Formulation. *Environmental Science and Policy* 7, 487-498.

<sup>7</sup> Arntzen et al. 2006. Southern African Food Systems in the Context of Global Environmental Change. *Environmental Science and Policy* (in prep).

## SAC5/11/2: GECAFS Conference April 2008

will be the Environmental Change Institute of the About 150-200 people are anticipated coming from many backgrounds and countries. The format will include:

*Plenary Sessions*, where leading researchers will be invited to present main research findings and examples of research result uptake.

*Parallel Sessions*, where specific science/policy issues could be discussed in more depth, or for workshops on, for instance, linking research between geographical areas.

*Satellite Sessions*, for related groups<sup>8</sup> and other Joint and Core Projects of the Earth System Science Partnership to convene science and/or business meetings, having learnt about GECAFS results during Plenary Sessions. Such sessions could also allow these groups to interact more formally with the GECAFS community.

	<b>Day 1</b> GECAFS Conceptual & Methodological Research	<b>Day 2</b> GECAFS Regional Research	<b>Day 3</b> GECAFS and Development & Policy
	Plenary Talk 1	Plenary Talk 6	Plenary Talk 11
	Plenary Talk 2	Plenary Talk 7	Plenary Talk 12
Break			
	Plenary Talk 3	Plenary Talk 8	Parallel Sessions
	Plenary Talk 4	Plenary Talk 9	
Lunch			
	Parallel Sessions	Parallel Sessions	Plenary Talk 13
			Plenary Talk 14
Break			
			Plenary Talk 15
	Plenary Talk 5	Plenary Talk 10	Close
Evening	Reception	Reception/Dinner	

Plenary talks 5 and 10 would Public Lectures by prominent speakers and would be followed by a short reception.

### **The role of *Environmental Science and Policy* in disseminating conference output**

A key aim of the conference is to advance and promote interdisciplinary research of policy relevance on environmental issues regarding food security. *Environmental Science and Policy* is widely seen as a leading journal for promoting communication among government, business and industry, academia, and non-governmental organisations involved in these (and either environmental issues). Further, as the journal emphasises the linkages between environmental issues and social and economic issues (including production, transport, consumption, growth, demographic changes and human well-being – all major aspects of the GECAFS agenda) publishing conference output in a special issue of *ESP* would be highly appropriate. It would both promote *ESP* within the wide community that GECAFS has established, and help disseminate GECAFS outputs internationally. The 15 plenary talks would be collated as the *ESP* Special Issue.

<sup>8</sup> E.g.: CGIAR Inter-Center Working Group on Climate Change; the International Group of Funding Agencies for GEC research; the International Dialogue on Science and Practice in Sustainable Development.

## **SAC5/11/2: GECAFS Conference April 2008**

### **Funding**

A Registration Fee (ca. US\$250) would cover venue costs, social events and a copy of the *ESP* special issue. University accommodation would be “at cost”. Most participants would be self-funded (for travel, accommodation and registration fee). Funding applications to DFID, ESRC, and international sources would help participation from developing countries and to offset costs of invited speakers.

\*\*\*\*\*

### **Proposal for ESP / Elsevier sponsorship**

It is proposed that:

1. Papers from the Plenary Sessions will be published in a special issue of *ESP*. This would include up to 15 papers, totalling ca. 200 pp.
2. Papers from Workshop Sessions could be published as series/special issues of other Elsevier journals, wherever possible.

### **The SAC is asked to: Note the plans for**

1. The upcoming ESSP OSC in Beijing in November 2006.
2. The GECAFS Conference in 2008 and make suggestions for possible side events.