

### Global Environmental Change

- .... over-exploitation of the natural resource base
- .... loss of biodiversity
- .... disruption to biogeochemical cycles and other aspects of Earth system functioning
- .... climate change
- .... potential increase in tropical storms, hurricanes and flooding

- ✓ All affect agriculture, fisheries, rural livelihoods and food security
- ✓ All driven by food system activities
- ✓ All world-wide, interacting phenomena
- ✓ Complex and varied international science agenda

### Food Security

.... exists 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. (FAO, 1996)

.... is based on three components: (i) food availability; (ii) food access; and (iii) food utilisation.

.... depends on more than food production

.... is diminished when food systems are stressed

### Developing Interdisciplinary Research Approaches

*to advance science and address policy*

#### I. Conceptual & methodological research on generic topics

- Food Systems Concepts
- Vulnerability Concepts
- Scenario Methods
- Decision Support Concepts

#### II. Policy-relevant research at regional-level

- Impacts
- Adaptation
- Feedbacks

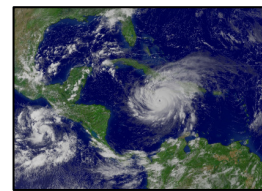
based on science and policy issues identified in regional projects



based on improved conceptual understanding and methods

## Global Environmental Change and Food Security in the Caribbean

- How will global environmental change (GEC) affect the vulnerability of food systems across the Caribbean?
- How might food systems be adapted to cope with GEC so as to enhance food security?
- What will be the environmental and socioeconomic consequences of different adaptation pathways?



climate change and weather extremes



food marketing and trade



infrastructure for food distribution

*GECAFS-Caribbean research will identify the social and geographical distributions of vulnerability of the region's food systems to GEC in the context of other stresses.*

## GECAFS Caribbean Research Goal

To determine strategies to cope with the impacts of global environmental change on food systems across the Caribbean and to assess the environmental and socioeconomic consequences of adaptation.

### Context

The 2005 Caribbean Regional Report on the Implementation of the Barbados Programme of Action (BPoA), recognised the need for integrated research, stressing food security and climate change adaptation.

The CARICOM Single Market and CARICOM Single Market and Economy are anticipated to have significant impacts on the region's food security, but effects are hard to predict. Further, growing concerns about GEC make policy-making even more complex:

- GEC will bring additional complications to many aspects of the region's food systems both directly through impacts on locally produced commodities and indirectly with the reduction of export revenues.
- limited awareness by many policy makers of GEC issues reduces their capacity to consider such concerns in refining existing and developing new policies aimed at addressing food security, environmental protection and conservation, and economic development.

### Research Questions

#### National-level

- How would changes in climate variability (and especially extreme events), water availability and sea level affect local communities' food systems?
- How would national and regional policies best be adjusted to enhance adaptation options?
- To what extent would these strategies affect food security by altering the reliance on local or imported commodities? How would changed land management and associated changes in runoff affect coastal fisheries and other aspects of coastal zone ecology, including income from tourism?

#### Regional-level

- How might GEC alter agricultural revenues and destabilise the region's food system?
- To what extent would improving trade between islands improve the resilience of the food system?
- How would enhanced regional trade affect national economic development and natural resource conservation?

### Caribbean Scenario Analyses

Scenario analyses conducted at regional level help to systematically explore policy and technical options for improving food security in the face of environmental and other stresses. They provide a suitable framework for (i) raising awareness of key environmental and policy concerns; (ii) discussing viable adaptation options; and (iii) analysing the possible consequences of different adaptation options for food security and environmental goals.

In 2005 GECAFS Caribbean collaborators developed a set of prototype scenarios for researching the interactions between food security and environmental change at the Caribbean regional level. The exercise undertaken in collaboration with FAO, MA, EEA and UNEP, and with funding from ICSU and UNESCO, involved four main steps:

- Step 1:** Identify key regional GEC and policy issues through stakeholder consultation workshops involving regional scientists and policymakers.
- Step 2:** Draft a set of four prototype regional scenarios based on the broad rationale, assumptions and outcomes of the MA scenarios exercise, but allowing for regional deviation where needed.
- Step 3:** Describe and systematically assess developments per scenario for each key food security determinant.

- Step 4:** Plot and compare each assessment of food security outcomes using the food security "determinants" as axes.

