

African GEC and Future Earth?

Presentation made on behalf of several authors and contributors e.g. ICSU ROA, AfricaNESS and Future Earth.

Origins of the Science Plan

- Two efforts that describe the GEC issues relevant for Africa:

- AfricanNESS Initiative
- ICSU ROA Science Plan

“A strategy for global environmental change research in Africa – science and implementation plan”

- Both initiatives took into consideration:

ICSU Strategic plan 2006-2011;

AU/NEPAD Africa's Science and Technology Consolidated Plan of Action:

UN Millennium Development Goals for Africa

- Both processes were transparent and participatory in nature.
- One writing team: E.O. Odada, R. J. Scholes, K. Noone, C. Mbow and W.O. Ochola (Source: Niang – IGFA presentation)

Seven principles

- Favour a limited number of multi-year coordinated research programmes over a large number of short-term, independent projects (a programmatic approach);
- Promote inter-disciplinarity, multi-institutional and regional research;
- Develop science-policy-practice interfaces (user-focussed approach to real-world problem solving and priority setting) ;
- Ensure that the products of scientific research are credible, salient and legitimate;
- Build lasting human and institutional capacity;
- Contribute to the global research agenda from an African perspective;
- Recognise and develop indigenous knowledge and capacity
- (Source –African GEC research in Africa document).

The Strategy Document ...

- *Describes the areas of global environmental change research that are of particular importance and interest for Africa*
- *Describes the basic research needed to support cogent decisions about adaptation and mitigation*
- *Lays out options for the support structure needed to facilitate and implement the research*
- (Source, African GEC doc and Niang – IGFA presentation).



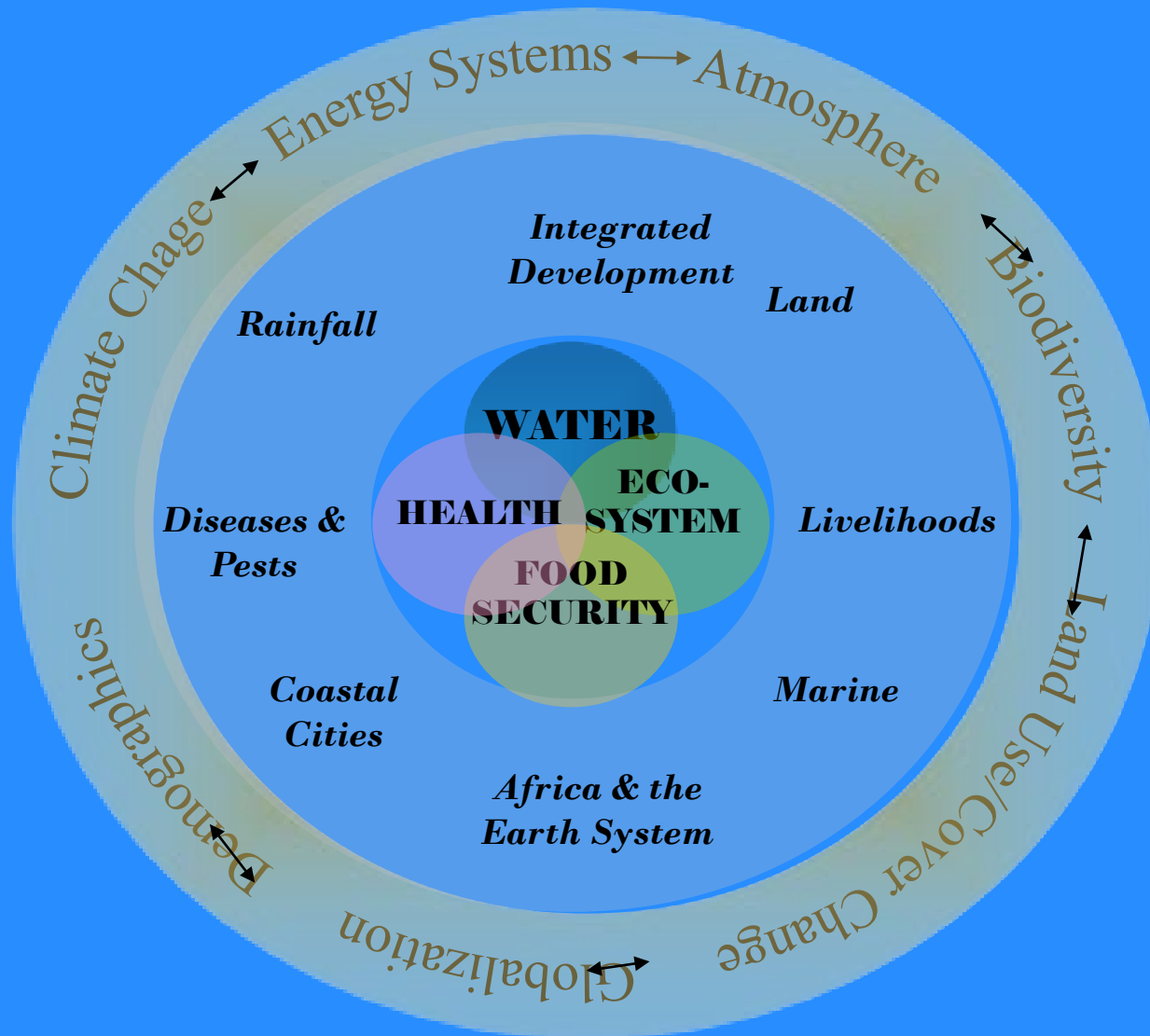
One framing question

How resilient are African social, environmental and economic systems to Global Environmental Change and what are the sustainable development strategies that can address these?

The science plan concentrates on four top-level issues:

- **Food and nutritional security**, including crops, wild-gathered resources, livestock resources and fisheries;
- **Water resources**, particularly in the water-limited sub-humid, semi-arid and arid regions;
- **Health**, especially in relation to the biodiversity-linked, environmentally-mediated and vector-borne diseases that are responsible for the high disease burden in Africa; and
- **Ecosystem integrity**, on which the persistence of biodiversity and the delivery of ecosystem services depend
- Source: African GEC doc and Niang, IGFA presentation).

Conceptual Framework (Source Niang – IGFA presentation)



Thematic Clusters (and research elements)

(Source Africa GEC doc, Niang IGFA presentation)

Rainfall Variability Distribution Processes Land surface feedbacks Rainfall in GCMs	Land Land Use & Cover Degradation Fragmentation Fires Biodiversity loss Water resources Wetlands	Livelihoods Fisheries Pastoralism Crop farming Vulnerable people and places	Cities Flooding Sea level rise Pollution Water resources Infrastructure
Diseases & Pests Environmental and emergent Advanced bioclimatic modelling	Africa and the Earth System Carbon cycle Dust aerosols Water cycle Ocean-land interaction Palaeoclimate Biogeochemistry Regional climate modelling	Integrated Development Energy Transportation Air quality Scenarios Governance	Marine Ecosystems and coral reefs Biodiversity and food resources Large-scale circulations

Future Earth attributes (Source Leemans)

- A global platform
- for international research collaboration

- augments earth system science with impacts of environment change on **people**, adaptation and transformation
- delivers **interdisciplinary** research on global environmental change for sustainable development
- strengthens partnership between researchers/funders/users (**co-design**)

Co-design, co-framing etc.

Problems of society are complex

Problem solutions are key but so are problem choice

Need cross-fertilization

Multiple methods

Dialogues etc. (see for example Julie Thompson Klein's work).

Climate Change

Water
Energy
Food
Land

Adaptation
Mitigation
Vulnerability
Resilience

Population growth
Migration
Urbanisation
Disasters
Poverty, Inequality
Conflict
Security
Geo-engineering
Technology... etc

Development
Green Economy
Education/Science
Communications
Media
Health
Agriculture
Transport
Law ... etc

Policy
Initiatives
and
Programmes

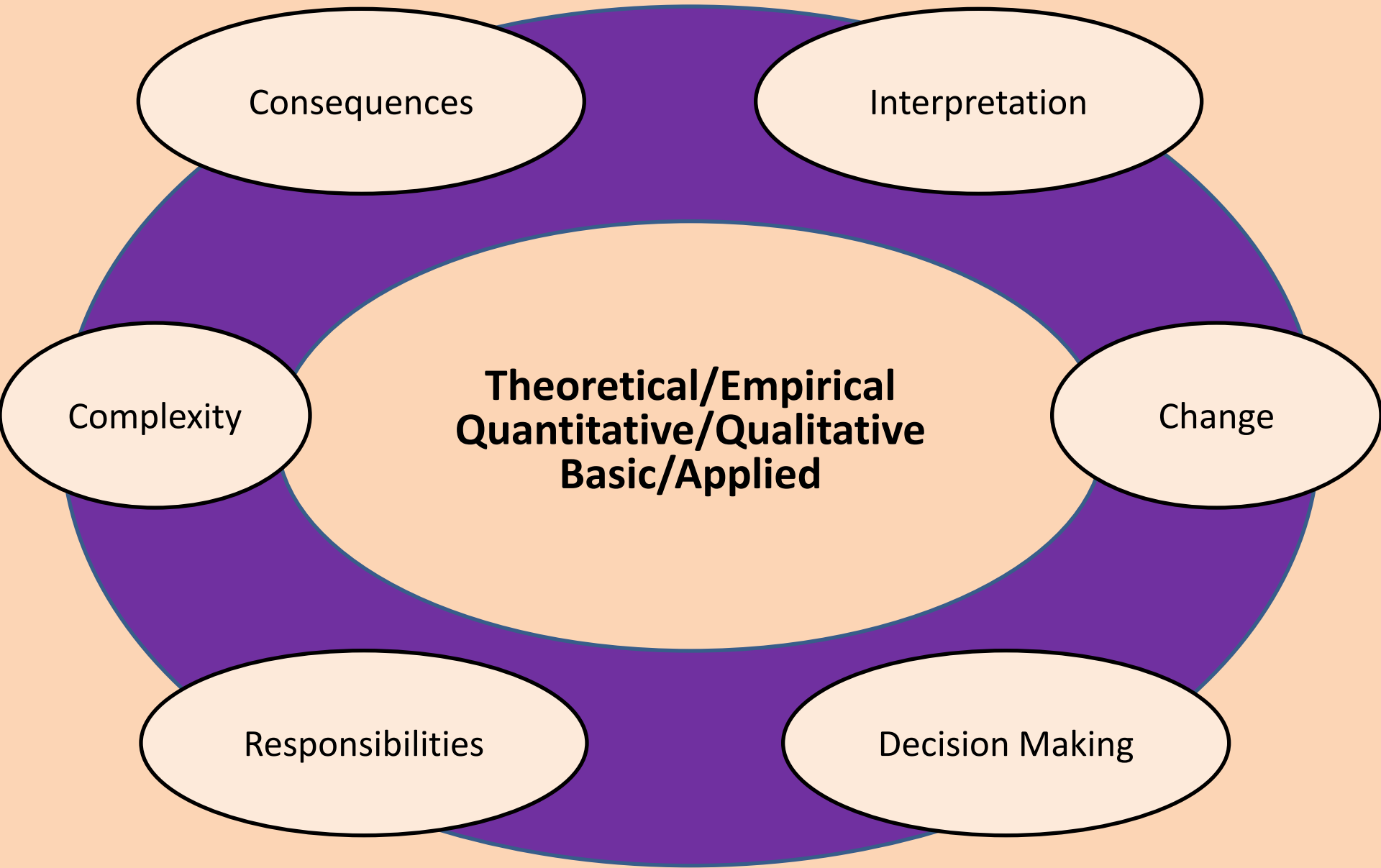
Ecosystems
Environmental
Services
Biodiversity



Transformative social science cornerstones

The social science questions that have to be asked
regardless of the concrete issue being addressed

(Source: Hackmann ISSC)



Summary for
Policy-Makers

World in Transition A Social Contract for Sustainability



The Great Transition Today A Report from the Future

Paul D. Raskin



GTI Paper Series

Frontiers of a Great Transition

2

3rd Nobel Laureate Symposium on Global Sustainability

Transforming the World in an Era of Global Change:
Stockholm, Sweden, May 16-19 2011

The Stockholm Memorandum

Tipping the Scales towards Sustainability
18 May 2011

What does it mean to transform?

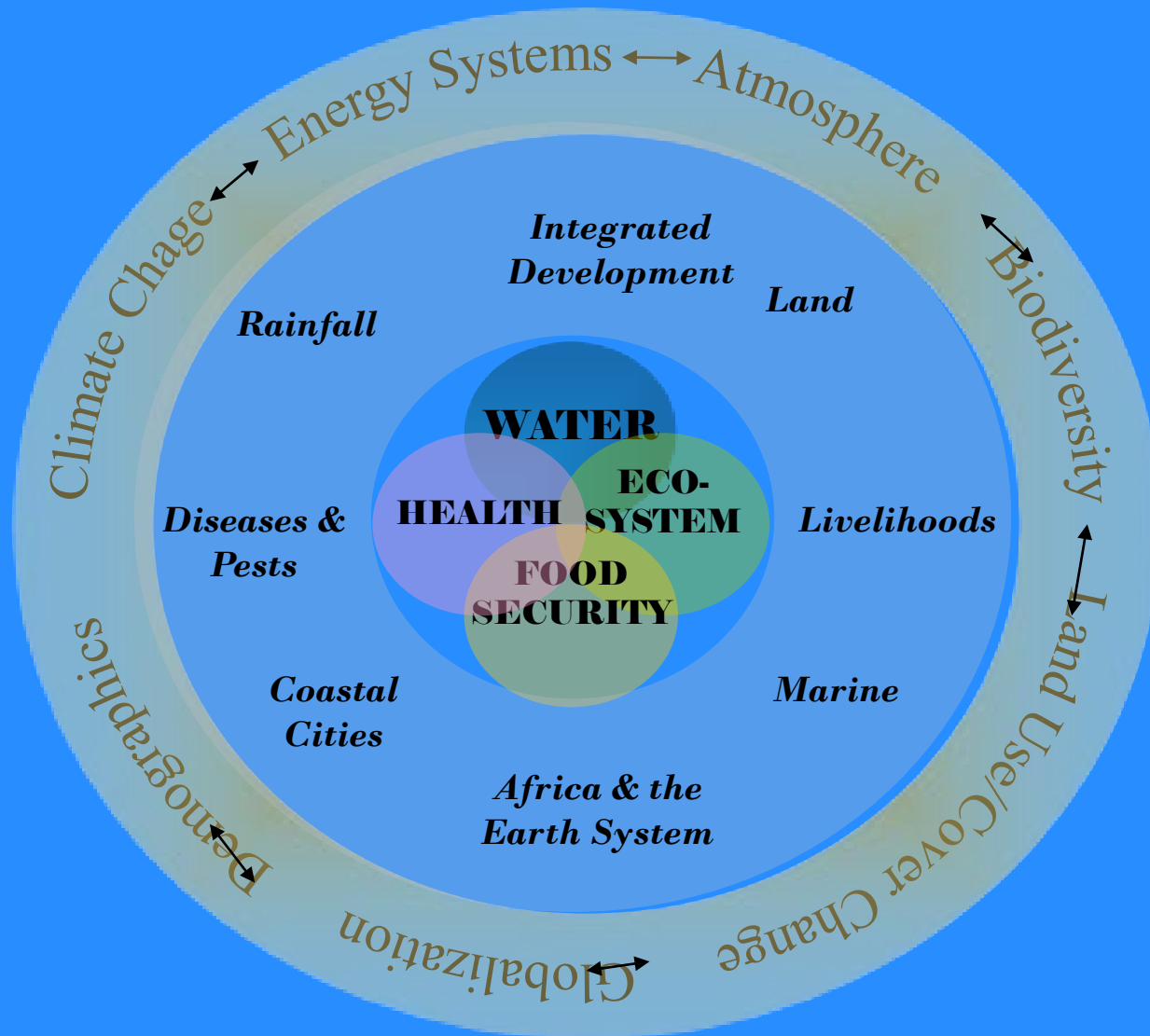
- Physical and/or qualitative changes in form, structure, or meaning-making.
- The powerful unleashing of human potential to commit, care and affect change for a better life.
- Not always considered desirable: Often creates uncertainty, discomfort and a sense of disequilibria (or anger and resistance if it seen as a response to particular interests and agendas)
- (Source Karen O'Brien, Oslo)



Some important questions about “transformation”:

- Do we know how to make it happen?
- Do we have a sufficient knowledge base to inform strategies and actions for deliberate, ethical and sustainable transformation at the rate and scale that is called for?
- Can we innovate rapidly enough, and with sufficient intelligence, to transform systems along pathways towards global justice, gender equity, and long-term social and ecological resilience?
- Does science itself need to change?
- (Source: Karen O’Brien, Oslo)

Conceptual Framework (Source Niang – IGFA presentation)

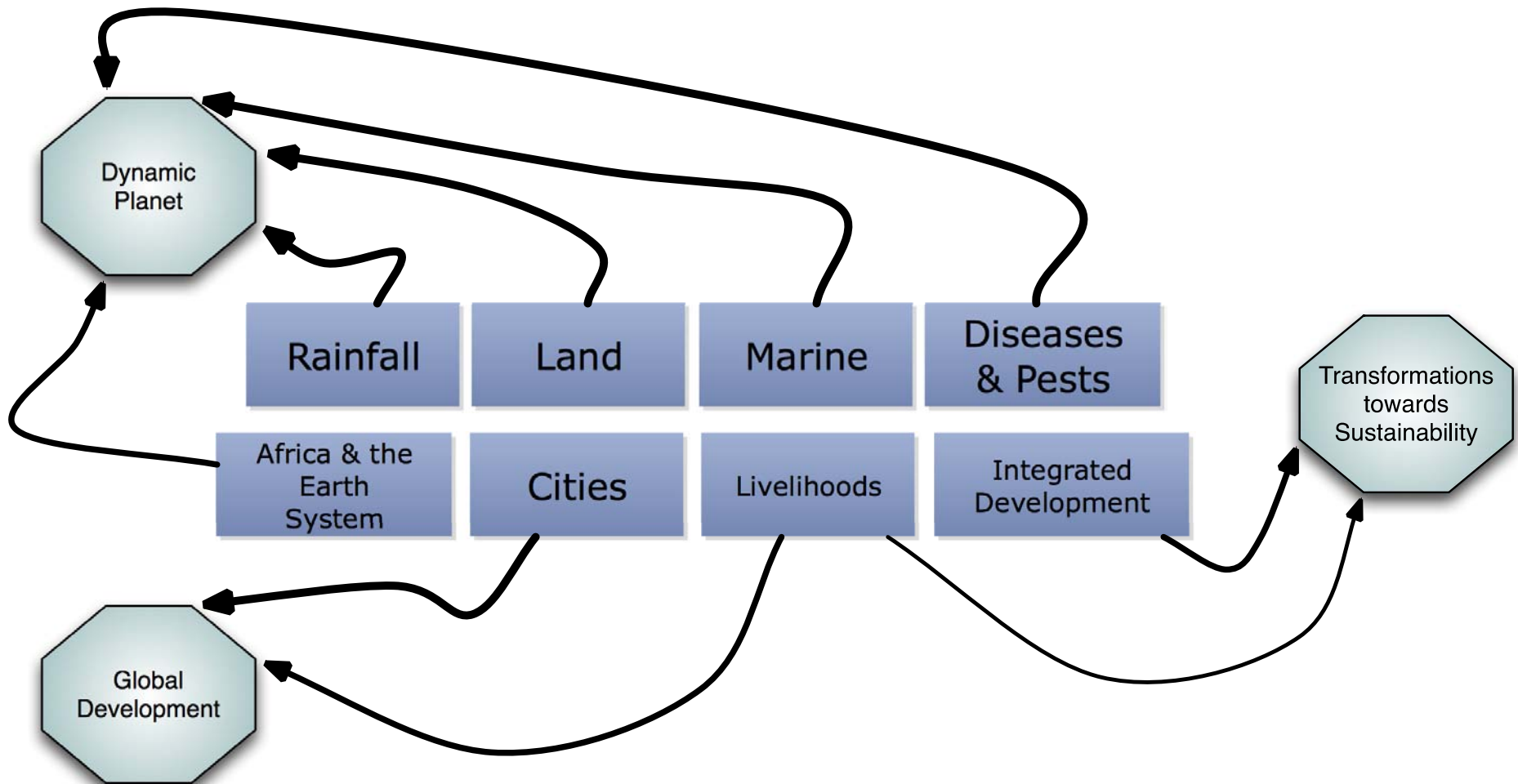


Conceptual framework for Future Earth



Thematic Clusters (and research elements)

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Drivers

Economic, demographic, Socio-Political, technical and cultural



Land use, resource management, ecosystems diversity and energy



Natural forcing factors
(sun, volcanoes etc.)

Pathways to Sustainability

Transformations and Solutions

Policy, Market, Behavioural, Technological, and Informational responses

Human well-being

Opportunities

Security

Empowerment

Livelihoods

Health

Values

Wealth

Access to food, water and energy
and human security

Global Environmental Changes

Climate

Material resources

Air Quality

Biodiversity and Ecosystems

Oceans and coasts

Land and soil productivity

Water quantity and quality

African opportunities and challenges going forward:

- Do we know how to make it happen?
- **IN PART YES, BUT WE WOULD NEED MORE DIALOGUE (TRANSDISCIPLINARITY APPROACHES) AND 'SAFE SPACES' TO ALLOW A REVISED PLAN AND THINKING TO EMERGE AND CAPABILITY SUPPORT (e.g. institutional, high tech science inputs and then more reflection on social science e.g. 'transformative cornerstones' ISSC).**

African opportunities and challenges going forward:

- Do we have a sufficient knowledge base to inform strategies and actions for deliberate, ethical and sustainable transformation at the rate and scale that is called for?
- **YES, RICH DIVERSITY OF SCIENCE – UNDERSTANDING OF THE PHYSICAL SYSTEM, CULTURAL, GOVERNANCE, STAKEHOLDER DIALOGUE, POLICY BUT MORE THINKING NEEDED ON ETHICAL AND DELIBERATIVE TRANSFORMATION, MATERIAL RESOURCE FLOWS ETC.**

African opportunities and challenges going forward:

- Can we innovate rapidly enough, and with sufficient intelligence, to transform systems along pathways towards global justice, gender equity, and long-term social and ecological resilience?
- **AFRICAN SCIENCE IN GEC HAS A STRONG GENDER, DEVELOPMENT AND EQUITY FOCUS BUT WE WOULD NEED MORE REFLECTION AND TRANSPARENT CO-PRODUCTION CO-DESIGN AND FUNDING AND INSTITUTIONAL DESIGN TO ENABLE THIS TO FULLY EMERGE.**
- Does science itself need to change? **ARE WE DOING SCIENCE 'FOR' OR 'WITH' SOCIETY????**

Sources and acknowledgements

- Various contributors to Africaness and ICSU ROA documents.
- Slides drawn from various presentations and source documents:
- Isabelle Niang,
- Gernot Klepper and Rik Leemans et al, Future Earth transition team.
- Karen O'Brien and Future Earth transition team.
- Kevin Noone various drafters of documents
- Future Earth Transition team
- Several GEC scientists in Africa, working on Africa
- ICSU team and ISSC (Heide Hackmann 'transformative cornerstones').