UNEP

Integrated Environmental Assessment Training Manual for the Arab Region

Module 1

The GEO approach to Integrated Environmental Assessment

Module 1 Sessions at a Glance

Session 1:	Introduction and Learning Objectives
Session 2:	UNEP's Assessment Mandate
Session 3:	GEO Rational and IEA Framework
Session 4:	The GEO Process and Products
Session 5:	The GEO-4 Process
Session 6:	GEO Products
Session 7:	Assessment and Reporting related to IEA

Learning Objectives

- Introducing the Global Environment Outlook (GEO) integrated environmental assessment (IEA) and reporting process.

- Understanding why the IEA approach is necessary for making policy relevant recommendations about the environmental state and trends, and links with human development.

OUTPUT

- Understand the mandate and role of UNEP in environmental assessment and reporting, and in capacity building;
- Describe the objective and scope of the GEO assessment;
- Compare and contrast IEA in the context of the first three GEO reports and the GEO-4 process; and
- Become familiar with examples of regional, national and sub-national GEO and IEA processes.

UNEP's Assessment Mandate

Since 1972, UNEP has had a mandate to review the global environment.

This was to be fulfilled in two main ways:

1) Establish a common methodology for assessment environmental developments and prepare reports;
2) Prepare reports on the state of and outlook for the environment for regions and internationally.

UNEP's Division of Early Warning and Assessment (DEWA)

DEWA implements the UNEP mandate with the following mission:

- Provide the world community with improved access to meaningful environmental data and information, and to help increase the capacity of governments to use environmental information for decision making and action planning for sustainable human development.

UNEP's GEO Assessment

- GEO Assessment is the UN's flagship assessment reporting process
- DEWA, in collaboration with other programs and partners worldwide, manages GEO
- Reports have been published in 1995, 1997, 1999 and 2003 and 2005.

Building Capacity and the Bali Strategic Plan

- A plan to help countries achieve environmental sustainability through technology and capacity building
- Adopted by UNEP's Governing Council in 2005
- Gives UNEP a mandate to assist with capacity building at national and regional levels
- Three priority areas:
  1) integration and implementation of environmental aspects of national sustainable development plans
  2) support national institutions with data collection and monitoring
  3) develop capacity for research, monitoring, assessment and early warning.

Discussion: GEO's Mandate and Evolution (20 minutes)

- What is your understanding of the role of GEO in implementing its mandate since 1972?

- The GEO approach to IEA has constantly evolved since the process started in 1995. What are the advantages and disadvantages of this approach?

Sessions at a Glance

- Session 1: UNEP's Assessment Mandate
- Session 2: GEO Rational and IEA Framework
- Session 3: The GEO Process and Products
- Session 4: Assessment and Reporting related to IEA

GEO Objectives

1. Provide decision makers with access to the best available scientific knowledge.

2. Facilitate interaction between science and policy.

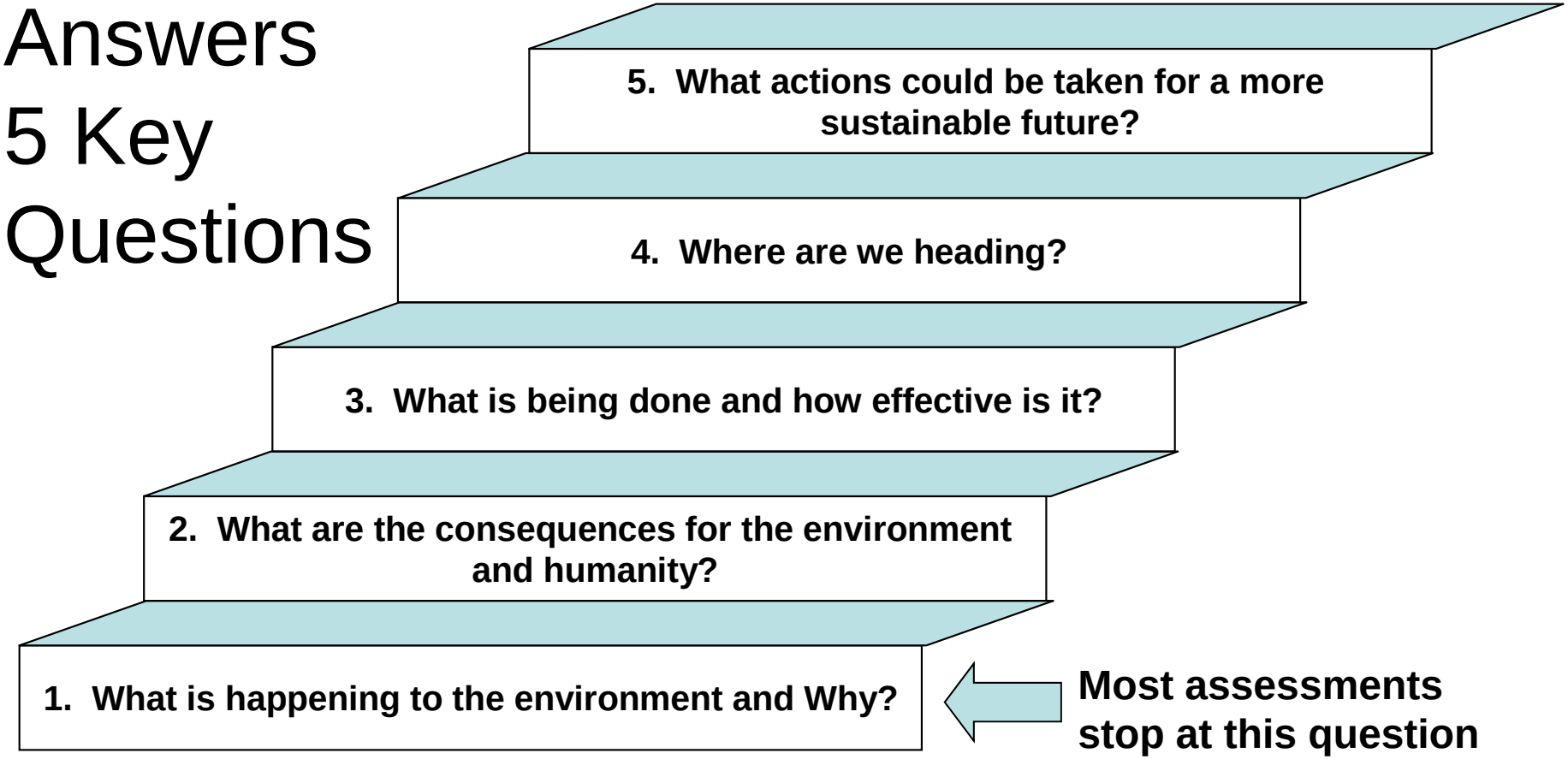
3. Build geographic and gender balanced relationships for environmental decision making.

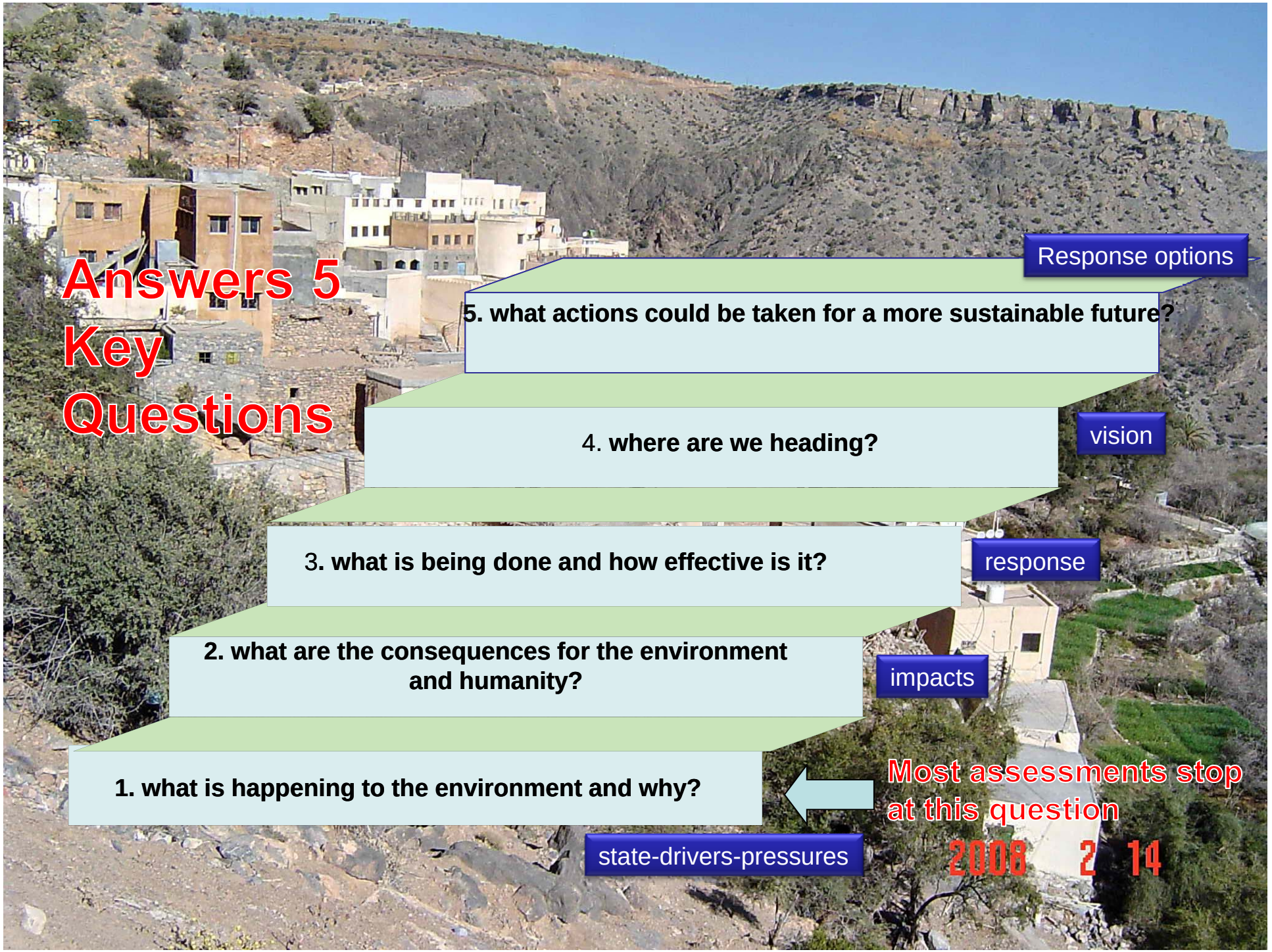
What is Assessment?

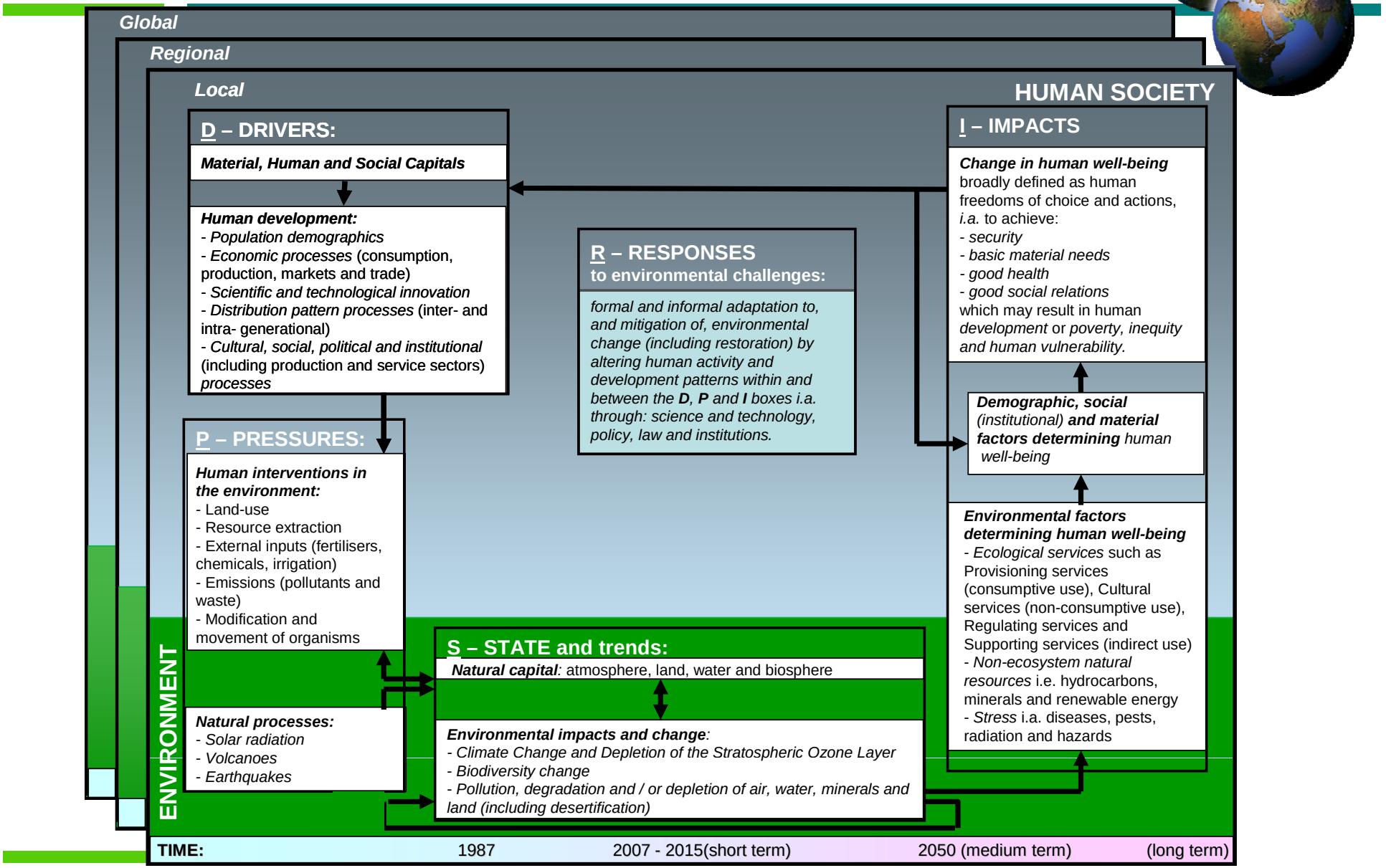
"the entire analytical process for undertaking a critical objective evaluation and analysis of data and information designed to meet user needs and support decision-making. It applies the judgment of experts to existing knowledge to provide scientifically credible answers to policy relevant questions, quantifying where possible the level of confidence"

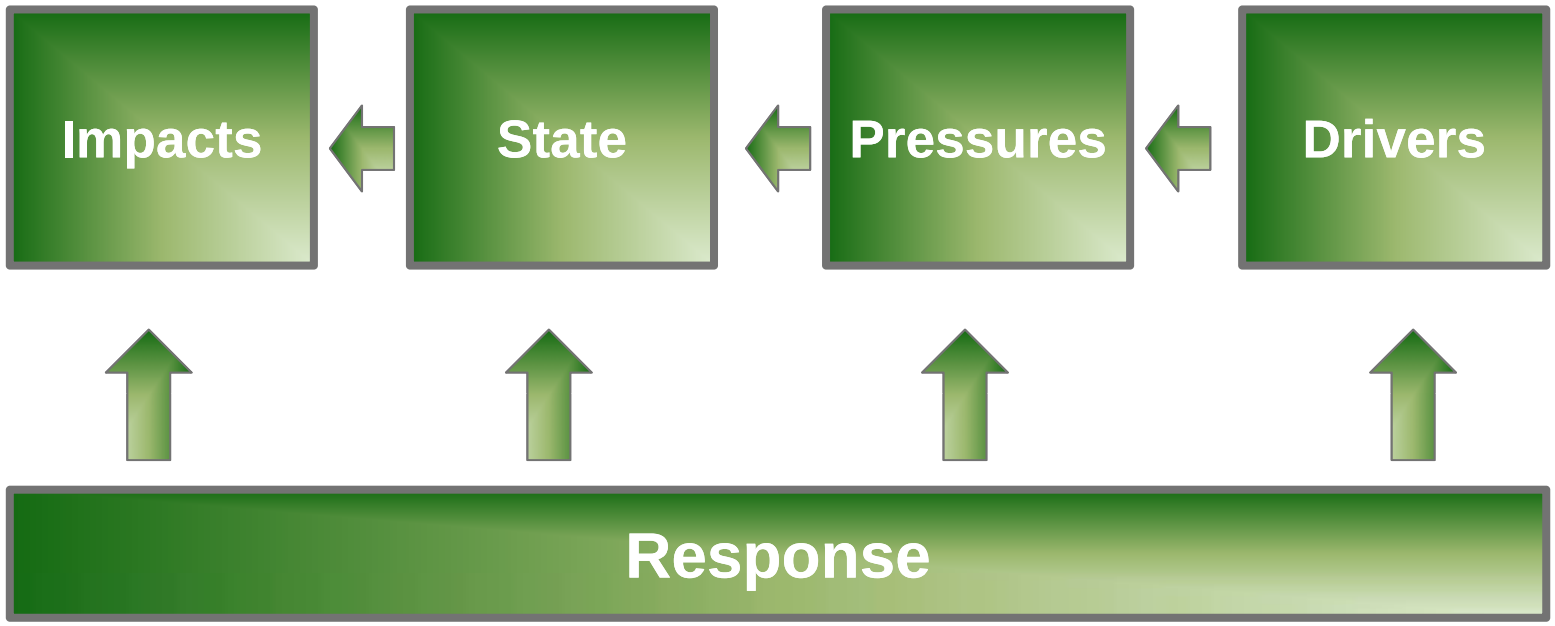
GEO: An Integrated Approach

Answers 5 Key Questions

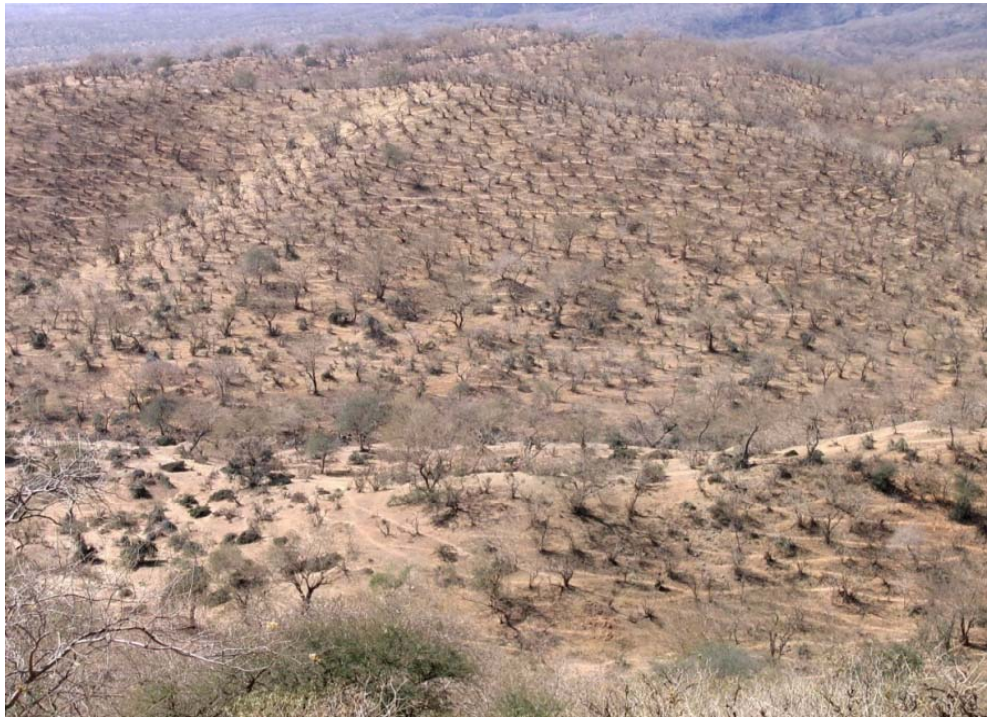



Answers 5 Key Questions
Response options
5. what actions could be taken for a more sustainable future?
4. where are we heading?
vision
3. what is being done and how effective is it?
response
2. what are the consequences for the environment and humanity?
impacts
1. what is happening to the environment and why?
Most assessments stop at this question
state-drivers-pressures
2008 2 14


Global
Regional
Local
HUMAN SOCIETY
D – DRIVERS:
Material, Human and Social Capitals
Human development:
- Population demographics
- Economic processes (consumption, production, markets and trade)
- Scientific and technological innovation
- Distribution pattern processes (inter- and intra- generational)
- Cultural, social, political and institutional (including production and service sectors) processes
R – RESPONSES to environmental challenges:
formal and informal adaptation to, and mitigation of, environmental change (including restoration) by altering human activity and development patterns within and between the D, P and I boxes i.a. through: science and technology, policy, law and institutions.
I – IMPACTS
Change in human well-being broadly defined as human freedoms of choice and actions, i.a. to achieve:
- security
- basic material needs
- good health
- good social relations
which may result in human development or poverty, inequity and human vulnerability.
Demographic, social (institutional) and material factors determining human well-being
Environmental factors determining human well-being
- Ecological services such as Provisioning services (consumptive use), Cultural services (non-consumptive use), Regulating services and Supporting services (indirect use)
- Non-ecosystem natural resources i.e. hydrocarbons, minerals and renewable energy
- Stress i.a. diseases, pests, radiation and hazards
P – PRESSURES:
Human interventions in the environment:
- Land-use
- Resource extraction
- External inputs (fertilisers, chemicals, irrigation)
- Emissions (pollutants and waste)
- Modification and movement of organisms
Natural processes:
- Solar radiation
- Volcanoes
- Earthquakes
S – STATE and trends:
Natural capital: atmosphere, land, water and biosphere
Environmental impacts and change:
- Climate Change and Depletion of the Stratospheric Ozone Layer
- Biodiversity change
- Pollution, degradation and / or depletion of air, water, minerals and land (including desertification)
ENVIRONMENT
TIME:
1987
2007 - 2015(short term)
2050 (medium term)
(long term)


Impacts
State
Pressures
Drivers
Response

State: The quality and quantity of natural resources, and the quality of the environment (i.e. level of air pollution, burnt area, forest area…)



Pressure: anthropogenic activities that pressure and change the environment (e.g. population growth, use of pesticides, and industrial discharges into water resources)

- **Impact:** The positive or negative effects produced by the state of the environment on aspects such as quality of life and human health, on the environment itself, on the built-up environment and on the local urban economy. human well-being and/or on the environment.

- % of children suffering from lead-induced health problems
- the mortality due to noise-induced heart attacks
- the number of people starving due to climate-change induced crop losses.

Response: activities (environmental, economic, institutional, or sectoral, policies) in response to changes (e.g. regulatory measures, issuance of laws, , financial allocations for environmental research…) programs , projects, and investments aiming at improving air quality- incentives to reduce emissions- air quality monitoring- policy and regulatory matters …

Where are we heading? Future outlook

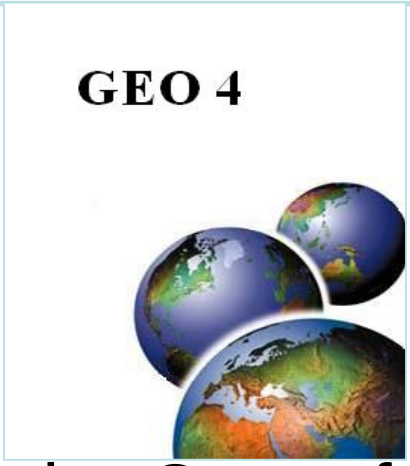
- Scenarios are a useful and effective tool for evaluating future environmental problems and the needed policies to resolve them. In addition, this approach has the potential of analyzing multiple complex data, and communicating them to decision-makers and the public.
- It is a summary and synthesis of scientific knowledge in a format that can be used by policymakers in developing informed policies.
- Scenarios help policy-makers visualize the different aspects and relations resulting from a specific environmental problem and the its long-term developments.
- "Scenarios are plausible, challenging and relevant sets of stories about how the future might unfold" for certain sectors/issues.

- A scenario is not a prediction of the future, rather a description of how it may unfold.
- Scenarios explore the possible not only the probable, and calls on its users to think beyond conventional wisdom.
- Support knowledge-based action through providing a deep look into the possible.
- It is capable of explaining the role of human activity in shaping the future, and the multiple linkages among issues, e.g. consumption patterns, environmental change, and anthropogenic impacts.

- Market First Scenario (BAU)
  - short term maximum economic growth.
  - technological solutions to environmental problems.
- Security first scenario "me first"
  - the powerful in society control access to resources.
  - improving human wellbeing of the rich and powerful.
- Policy First Scenario
  - lean strongly towards economy
  - enforce environmental laws using top-down approach.
- Sustainability first scenario
  - equity in socio-economic and environmental policies.
  - Sustainable development

What actions could be taken for a more sustainable future?

Policy options:



- Cross sector
- Sectoral
- Chapter 10 From the Periphery to the Core of Decision Making – Options for Action

What is Integrated Environmental Assessment (IEA)?

- A participatory and structured approach that links knowledge and action

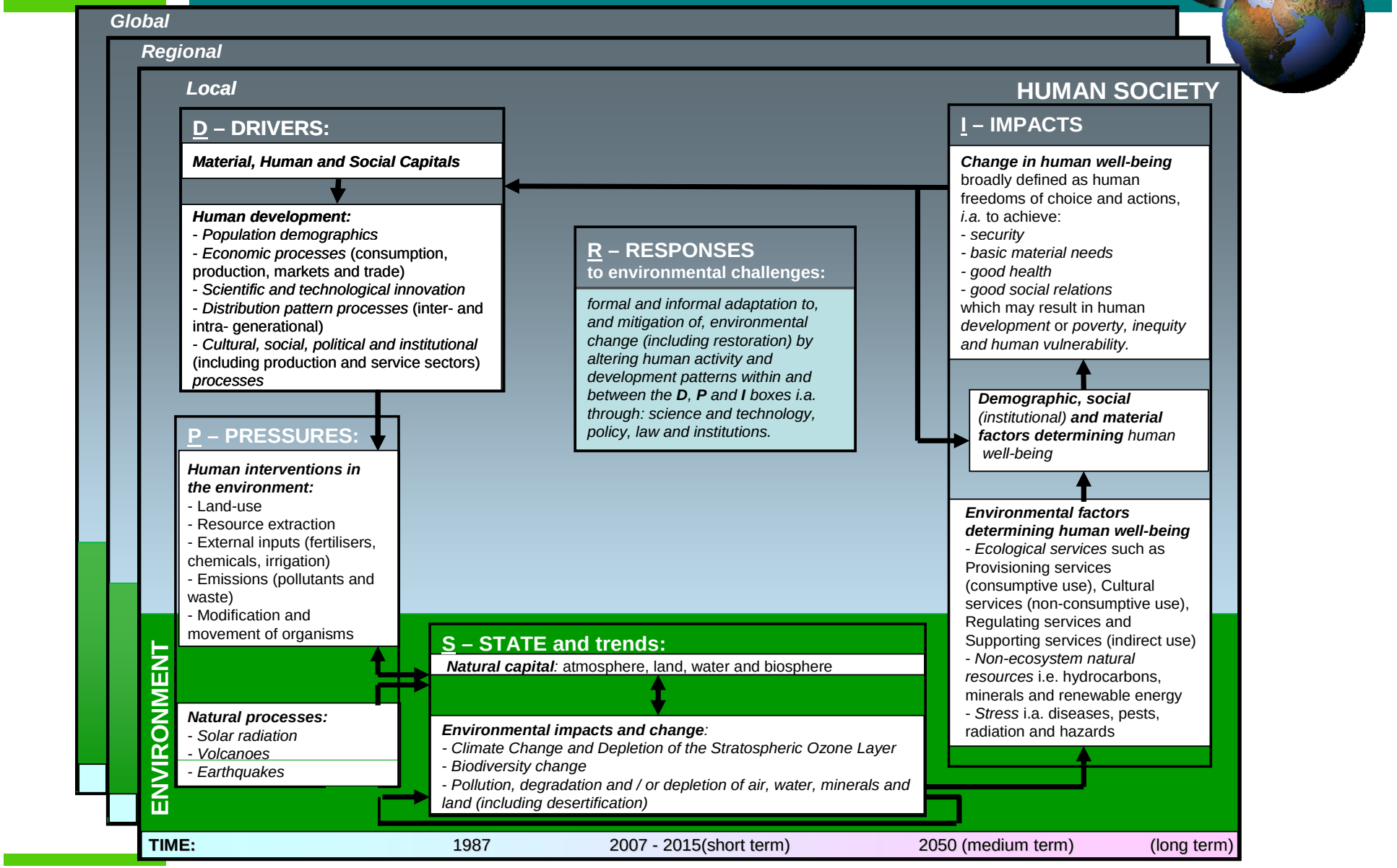
  - **Links environmental state and trend analysis with policy analysis;**
  - **Incorporates global and sub-regional perspectives;**
  - **Includes historical and future perspectives;**
  - **Covers a broad spectrum of issues and policies;**
  - **Integrates environmental change and human well-being.**

- IEA further enables policy makers to address complex challenges.

Discussion: Using an Integrated Approach (20 minutes)

In groups of 3-4 people, choose an issue, and discuss:

- **Why is an integrated approach is needed to address this issue?** If you chose not to use an integrated approach, what approach would you follow, and how would that be weaker?
- **What policy sectors need to be addressed** (energy, agriculture, trade, transport, health, etc.)?
- **How is the problem linked to events at the global level** (e.g., UN Framework Convention on Climate Change, World Trade Organization or other UN conventions)?
- **How could this issue evolve over the coming two decades?**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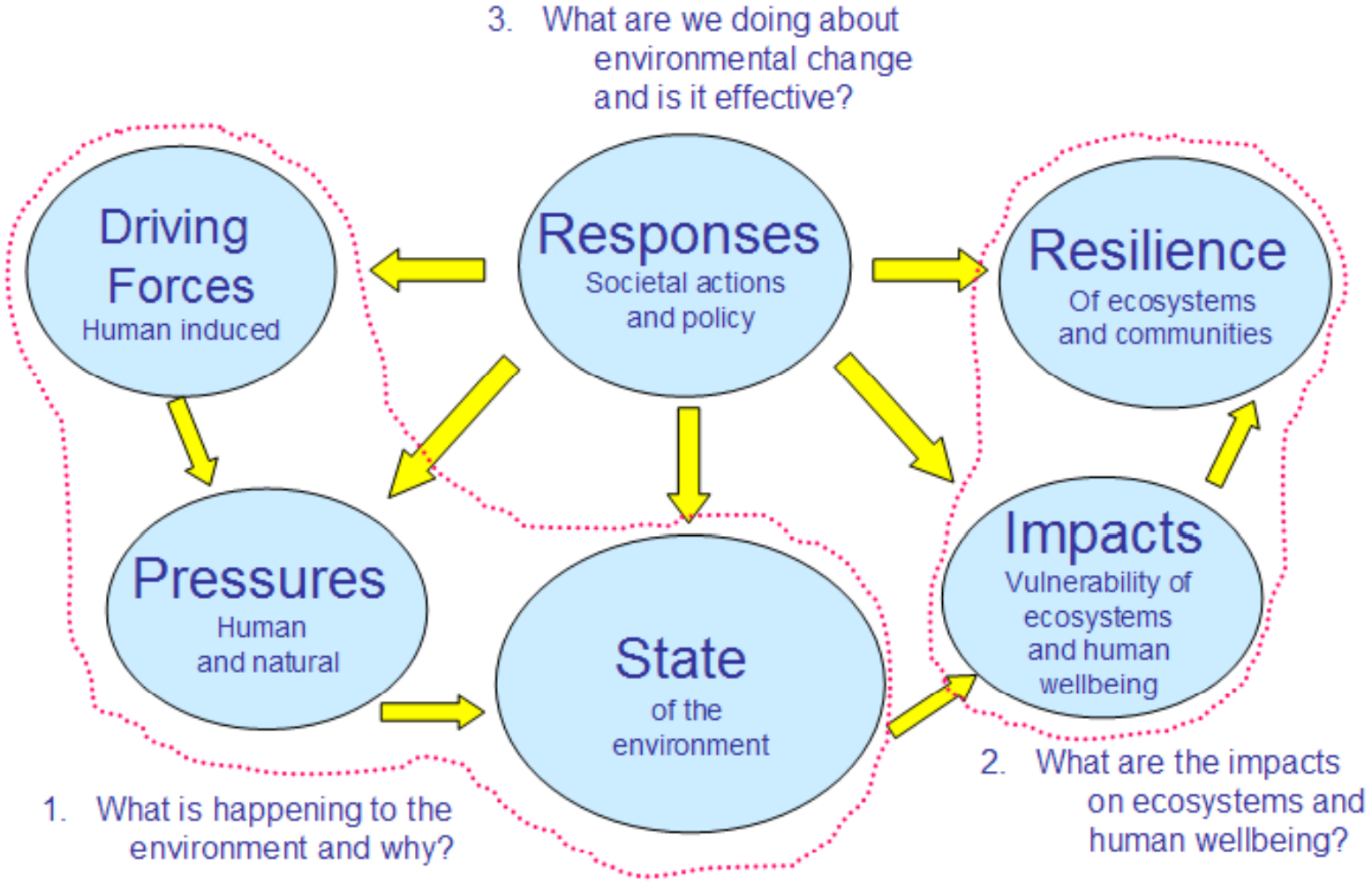
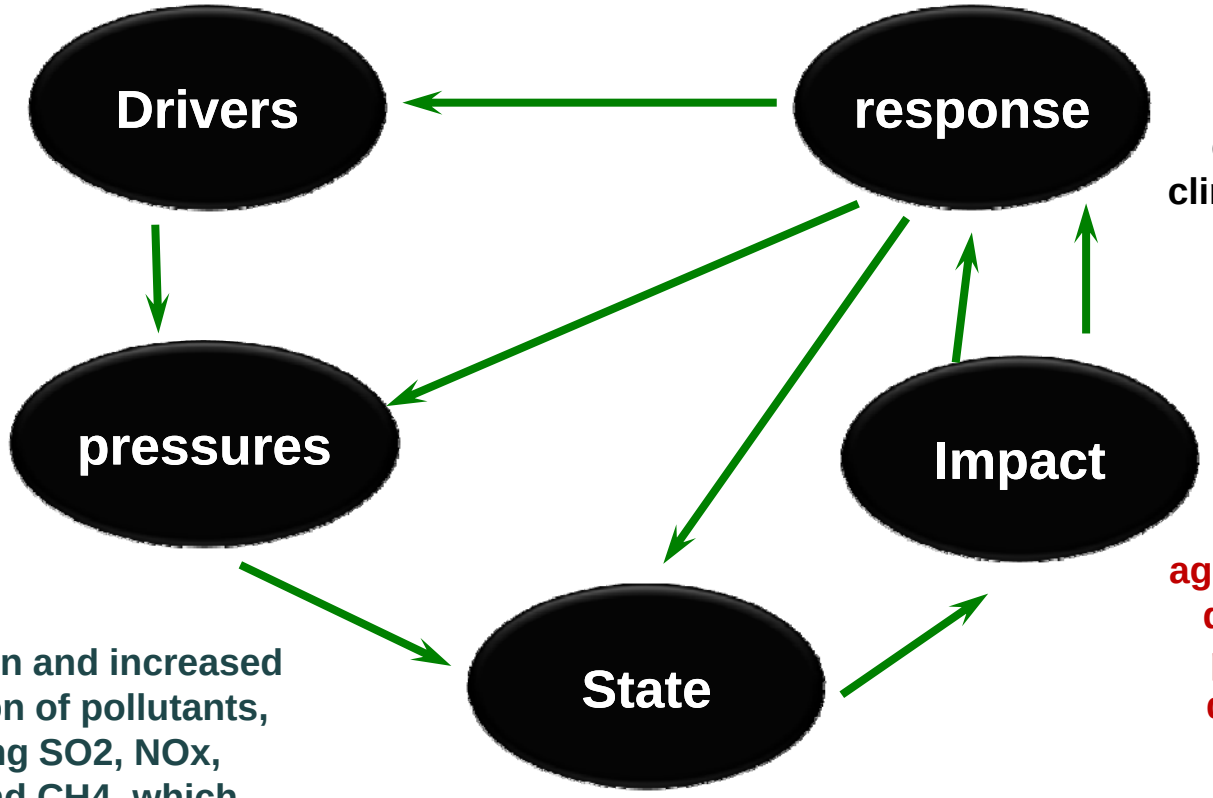

3. What are we doing about environmental change and is it effective?
Driving Forces
Human induced
Responses
Societal actions and policy
Resilience
Of ecosystems and communities
Pressures
Human and natural
State
of the environment
Impacts
Vulnerability of ecosystems and human wellbeing
1. What is happening to the environment and why?
2. What are the impacts on ecosystems and human wellbeing?

Increased use of fossil fuel in transport, industry, heating, and energy generation



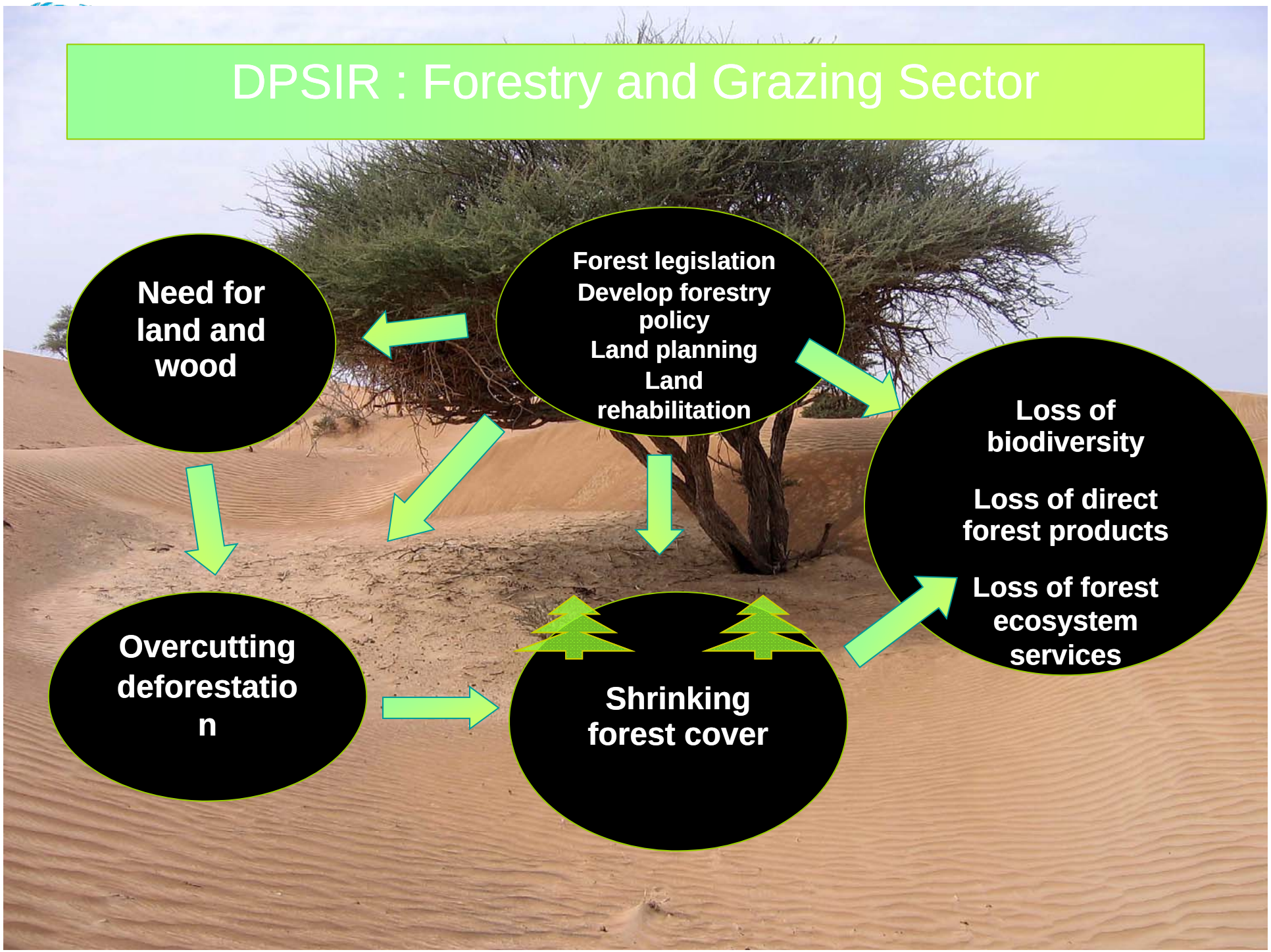
Ratification of UNFCCC, taking mitigation action, developing adequate environmental policies for climate change, establishing national climate change committees

Health Impacts on humans, reduced agricultural production, diminishing quality of products, and further deterioration of metal structures in form of rust

Pollution and increased emission of pollutants, including SO2, NOx, CO2, and CH4, which puts pressure on the environment

Gas concentrations, air-suspended particulate matter, temperature criteria, rain distribution

DPSIR : Forestry and Grazing Sector



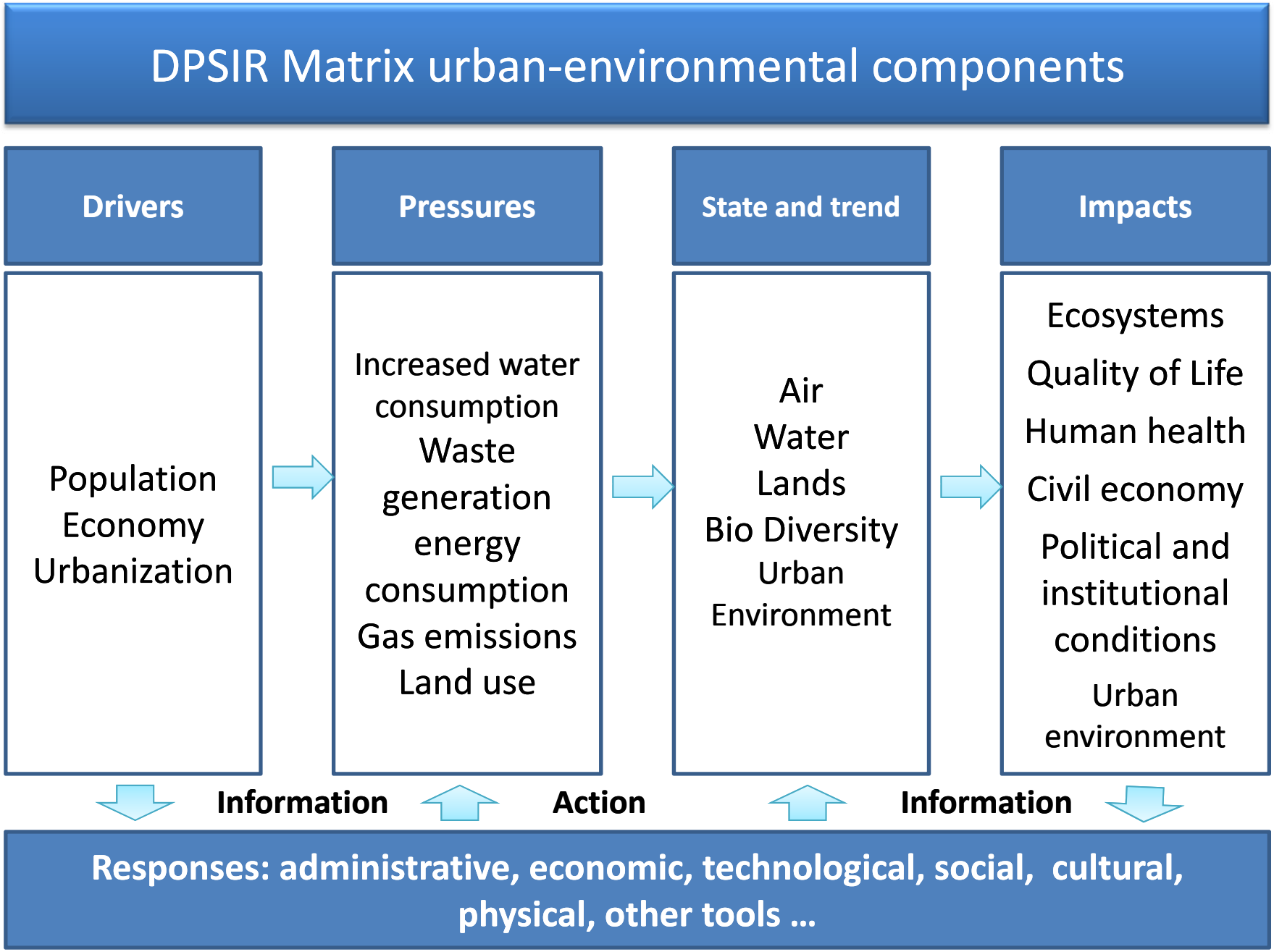
Gender Mainstreaming

- What is Gender mainstreaming?
- Needs to be included in GEO Process and Products
- Is a continuous process with institutions, programs and analytical efforts.

Exercise: The GEO Framework

Return to your groups of 3-4 people, and use the same environmental from the previous discussion.

- Identify drivers, pressures, state (and trends), impacts and responses.
- Discuss which of the drivers and pressures are at the national level and which are at the global level.
- Discuss what specific impacts on ecosystem services and human well-being are most relevant for the environmental issue of concern.


DPSIR Matrix urban-environmental components
Drivers
Pressures
State and trend
Impacts
Population
Economy
Urbanization
Increased water consumption
Waste generation
energy consumption
Gas emissions
Land use
Air
Water
Lands
Bio Diversity
Urban Environment
Ecosystems
Quality of Life
Human health
Civil economy
Political and institutional conditions
Urban environment
Information
Action
Information
Responses: administrative, economic, technological, social, cultural, physical, other tools …

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A Participatory Approach

…is essential when dealing with complex issues where there is uncertainty and societal awareness is necessary.

…facilitates interaction between science, decision making and policy making.

…gives GEO assessments scientific credibility, accuracy and authority.

GEO Participation and Consultation

- GEO Collaborating Centres at the core of the assessment process
  - Comprehensive peer review with multiple stakeholders
  - Advisory groups provide conceptual and methodological guidance
  - Expert groups provide written content
- Interactive online data portal at heart of consultation process

GEO Themes

State and trends	→	biophysical resources **…for example**
Good and services	→	water and biodiversity
Sectoral analysis	→	energy and tourism
Cross-cutting	→	gender, diversity, poverty
Forward looking	→	scenarios in the future

The GEO- 4 process

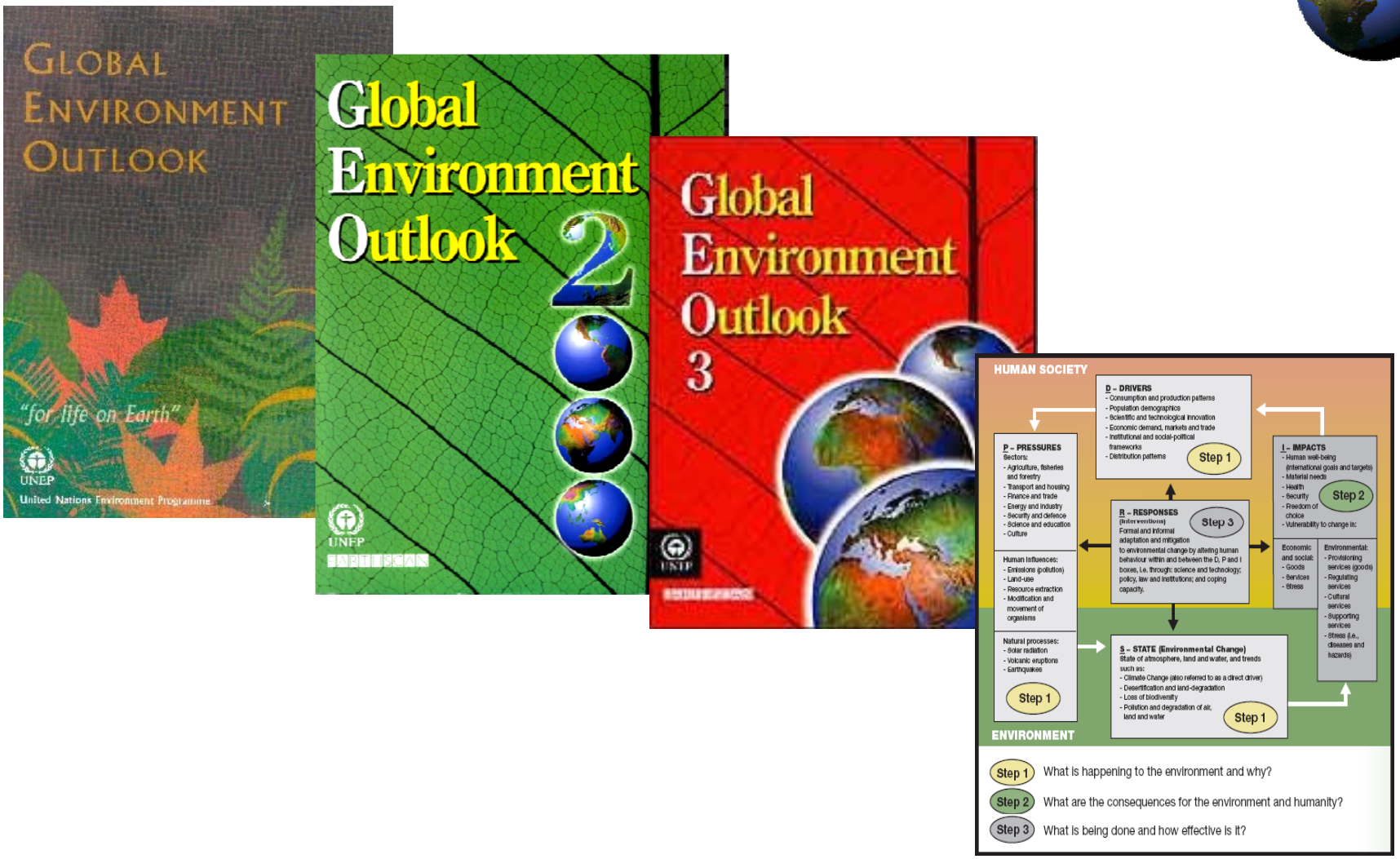
- In 2004, preparations started for *GEO-4*, which is published in 2007.
- A series of regional consultations at the start of the process to identify regional priorities for the next assessment;
- A strengthened and comprehensive peer review process using chapter review editors to increase the scientific credibility and legitimacy of the process;
- An intergovernmental consultation to discuss the content of the assessment report and the design of the assessment process;
- Nominations by governments of experts to be included in the assessment process;
- An expert group on human well-being, and chapter expert groups to draft chapters;
- A structured process for developing regional scenarios; and
- Consideration of the methodology and results of the millennium ecosystem assessment (MA) in the design and implementation of the *GEO-4* assessment.

GEO Products

GEO has a wide range of products, all based on the GEO Data Portal.

- Global assessments (*GEO-1*, *GEO-2* and *GEO-3*)
- GEO Yearbooks (2003; 2004/5, 2006)
- Regional and sub-regional Reports
- Technical Reports
- GEO education products

GLOBAL ENVIRONMENT OUTLOOK SERIES



Discussion: Mandate and Capacity for GEO (20 minutes)

1. What benefits does a strong mandate bring to an assessment process?

   Consider needs for financial support, policy relevance and the potential for getting recommendations implemented.

Discussion: Mandate and Capacity for GEO

(20 minutes)

2. What are the most urgent capacity needs for carrying out an integrated environmental assessment in your country?
   - Are there enough trained scientists, policy makers, managers and analysts?
   - Do potential users have enough understanding of causes and consequences of and responses to environmental change?

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Practices Similar to IEA

- State of Environment (SoE) Reporting
- Environmental Impact Assessment (EIA)
- Strategic Environmental Assessment (SEA)
- Integrated Assessment

State of Environment Reporting (SoE)

- SoE reporting is likely **most relevant to IEA**
- It involves reporting on the **condition of the environment.**
- The report is based on **human activities and impacts.**
- **Scientific protocols**, including peer review are used.
- SoE has a **broad mandate** to inform the public and decision-makers.
- SoE reports are a **valuable resource** when planning an assessment methodology.

SoE Resources and Tools Relevant to IEA

- Organizational structure for reporting and governance
- Process design
- Expert and stakeholder participation
- Priority environmental issues and policies
- Information sources and tools
- Communication and impact strategies

Environmental Impact Assessment (EIA)

- A tool to assess the environmental **impacts and risks of an activity**.
- Purpose is to inform decision-makers and other stakeholders **about impacts** and,
- To suggest ways to reduce or **minimize impacts.**
- The quality of an EIA depends on the application of its framework and the **quality of its science.**

Strategic Environmental Assessment (SEA)

Can be defined as:

The systematic and comprehensive process of evaluating at the earliest possible stage, the environmental effects of a policy, plan or programme and its alternatives

(adapted from Thérivel and Partidário 1996).

Comparing and Contrasting SEA and IEA

1. SEA is a methodology for policy analysis; EIA includes policy analysis in a broader approach.

2. SEA does not involve regular reporting while IEA explicitly does.

3. SEA may focus on one policy or programme while IEA scans the entire spectrum of relevant policies, and then will single out a priority policy.

4. Essentially, SEA seeks to incorporate policy learning and adaptation in an early phase of policy planning.

Exercise: Describing a National Environmental Reporting Initiative

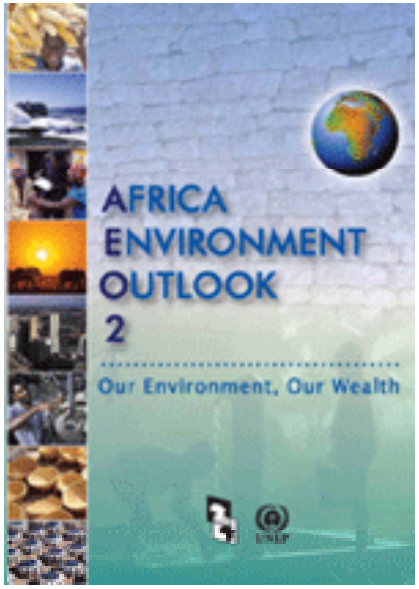
- Form groups of 3-5 people
- Describe a past or ongoing environmental reporting initiative in your country, using the format on the next slide.

1. Name of initiative
2. Organization responsible
3. Frequency of analysis
4. Geographic coverage
5. Main steps of reporting process
6. Key participants involved
7. Conceptual framework used
8. Key sections in the report
9. SoE Products
10. How information is used in policy development or analysis

A few GEO Examples

1. Regional: **AEOR (to be issued)**
2. National: **UAE, Lebanon, Egypt, etc..**
3. Sub-national: **Mexico City**

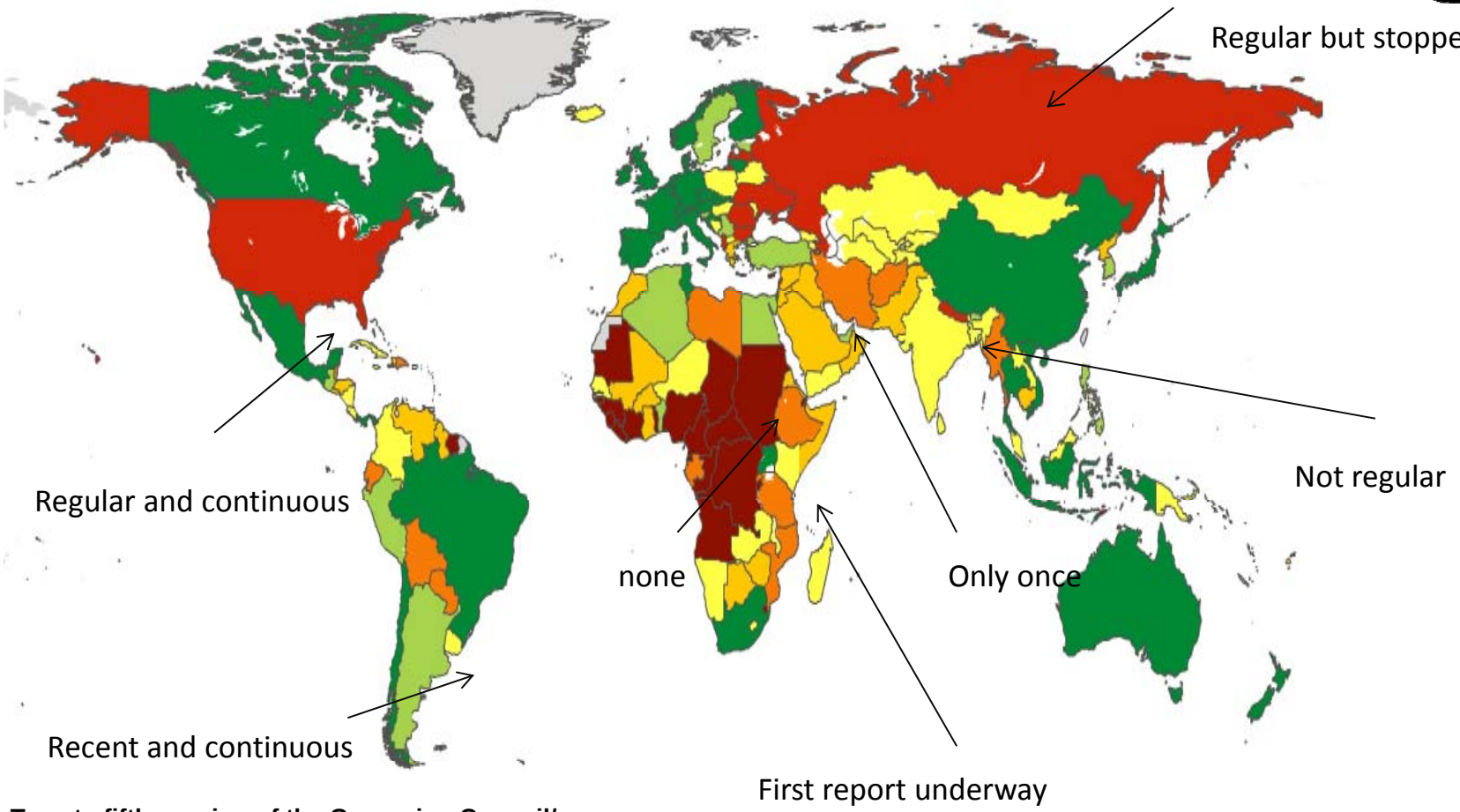
Regional: Africa Environmental Outlook



Africa Environmental Outlook: Mandate and Process

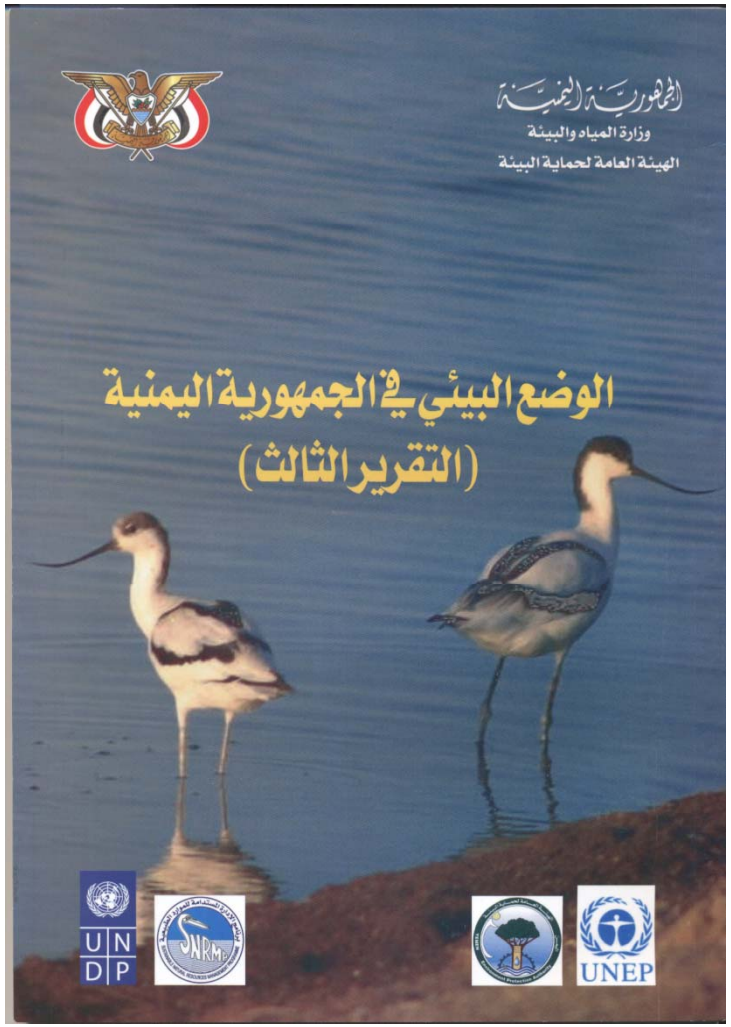
- Process initiated in 2000 by the African Ministerial Conference on the Environment
- AEO-1 launched in 2002 and AEO-2 launched in 2003
- AEO-2 involved six Collaborating Centres:
  - Central Africa
  - Eastern Africa
  - Northern Africa
  - Southern Africa
  - Western Africa
  - Western Indian Ocean Islands

Frequency of the National SOE Reporting Processes in 196 countries



Twenty-fifth session of the Governing Council/ Global Ministerial Environment Forum
Nairobi, 16–20 February 2009
Item 4 (a) of the provisional agenda

SoE in the Republic of Yemen



- Chapter One: Environment and development
- Chapter Two: state of the environment and policy analysis
- Chapter Three: Environmental Management
- Chapter Four: Priorities of environmental action
- Chapter Five: Future Outlook

http://www.soe.ae/Abu_Frontpage.aspx?m=209

Themes and issues

Major environmental themes assessed

- Atmosphere
- Biodiversity
- Land use
- Marine resources
- Water
- Waste
- Cultural heritage

Key environmental issues assessed

- Air pollution increasing
- Hazardous waste untreated
- Land use change
- Many species threatened
- Over fishing
- Strain on heritage sites
- Unsustainable water consumption

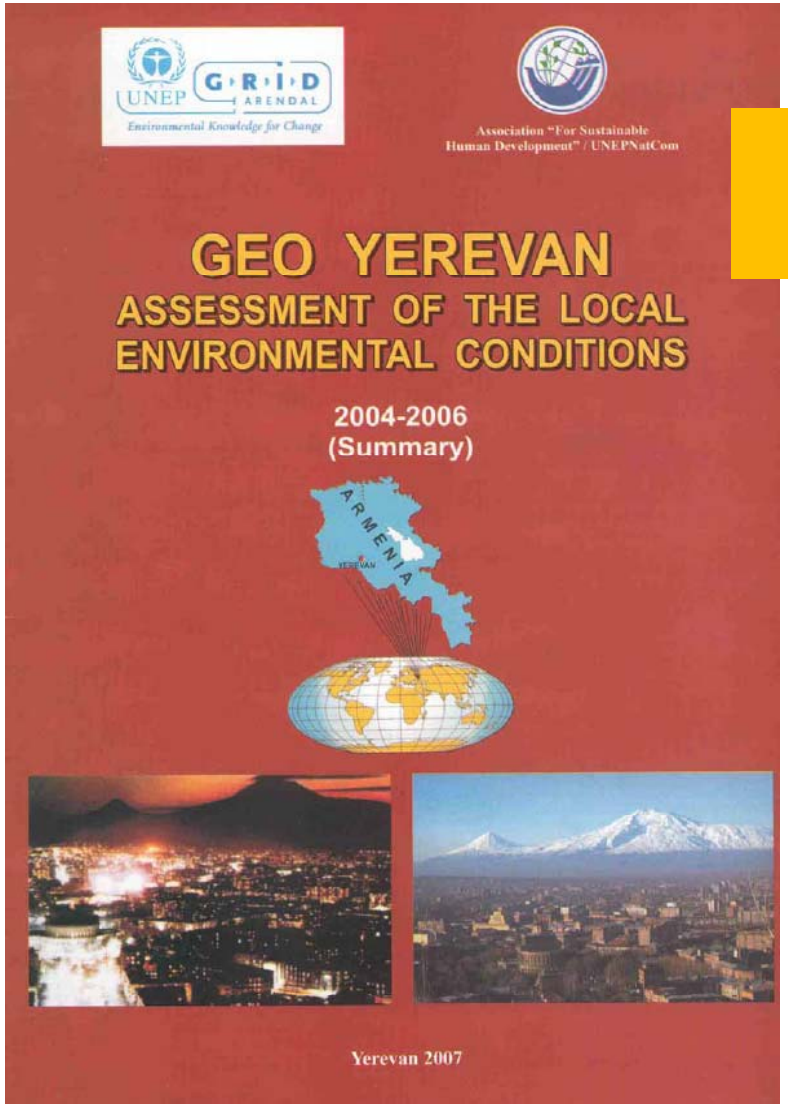
SoE Report Egypt 2007

http://www.eeaa.gov.eg/arabic/info/report_soe2008.asp

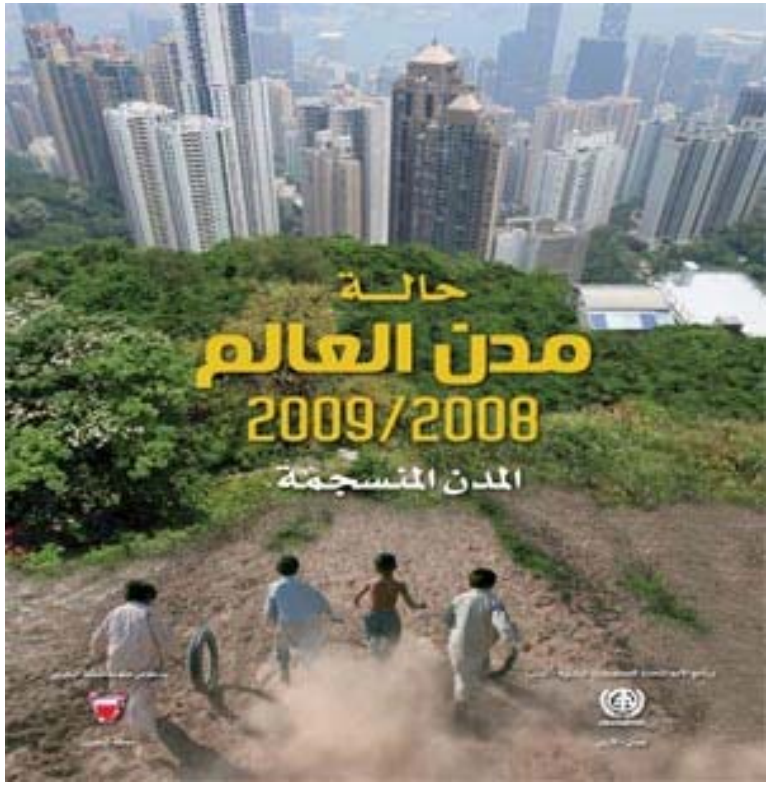
GEO Nairobi

- What are the available environmental resources in Nairobi (state of resources and trends)?
- What are the available opportunities to use resources in promoting sustainable development and reducing poverty (value/ opportunities and potentials)?
- What are the main challenges facing the city of Nairobi when it comes to seizing opportunities to use resources (demand/Pressures)?
- What political and institutional measures should be taken so as to make use of opportunities (policy action)?
- What shall be the consequences if Nairobi is unable to seize the opportunities (outlook)?

UNEP



GEO YEREVAN



Africa Environmental Outlook: Issue Assessed

- Consultative group on data and issues was formed and sent to other stakeholders for comment.
- Issues areas included atmosphere, land, freshwater, forests and woodlands, coastal and marine environments, and biodiversity
- Considered human drivers of environmental change and how these impacted on human well-being.
- Covered demographic change, poverty, social change (including gender and division of labour), health and education
- Highlighted emerging issues such as alien species, chemicals, genetically modified crops and environment & security.

Africa Environmental Outlook: Questions Addressed

- How and why is the environment important from a human perspective?
- How is the environment changing, and why, and what opportunities does it hold?
- Are there special issues, which affect the environment and development, that require immediate attention and new approaches?
- How will different policy choices affect the future?
- What can be done to ensure that environmental value is retained and the lives of people are improved?

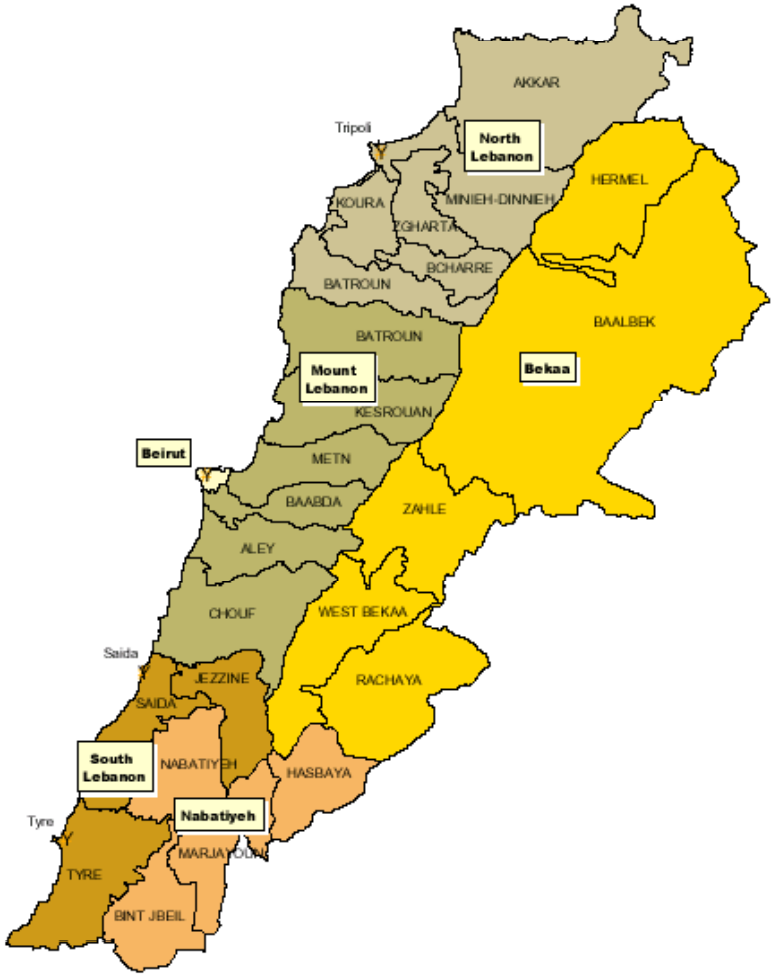
Africa Environmental Outlook: Impact and Follow-up

- Used as background document in the New Partnership for African Development (NEPAD) Environment Action Plan adopted by the African Union Heads of State summit in 2003
- Endorsed in the World Summit on Sustainable Development
- The Opportunities Framework in AOE-2 was embraced by the region with other assessment processes highlighting it
- 24th Session of the UNEP Governing Council /Global Ministerial Forum acknowledged the AEO-2 in linkage sustainable development and poverty reduction

Discussion: Africa Environmental Outlook

- Where the findings surprising?
- Do you think they would be useful in setting policy?
- Are these findings different from what you would expect in your region?
- In what ways might you guide the process differently, if you were involved in a similar process, on a continental scale?

2001 Lebanon State of the Environment Report

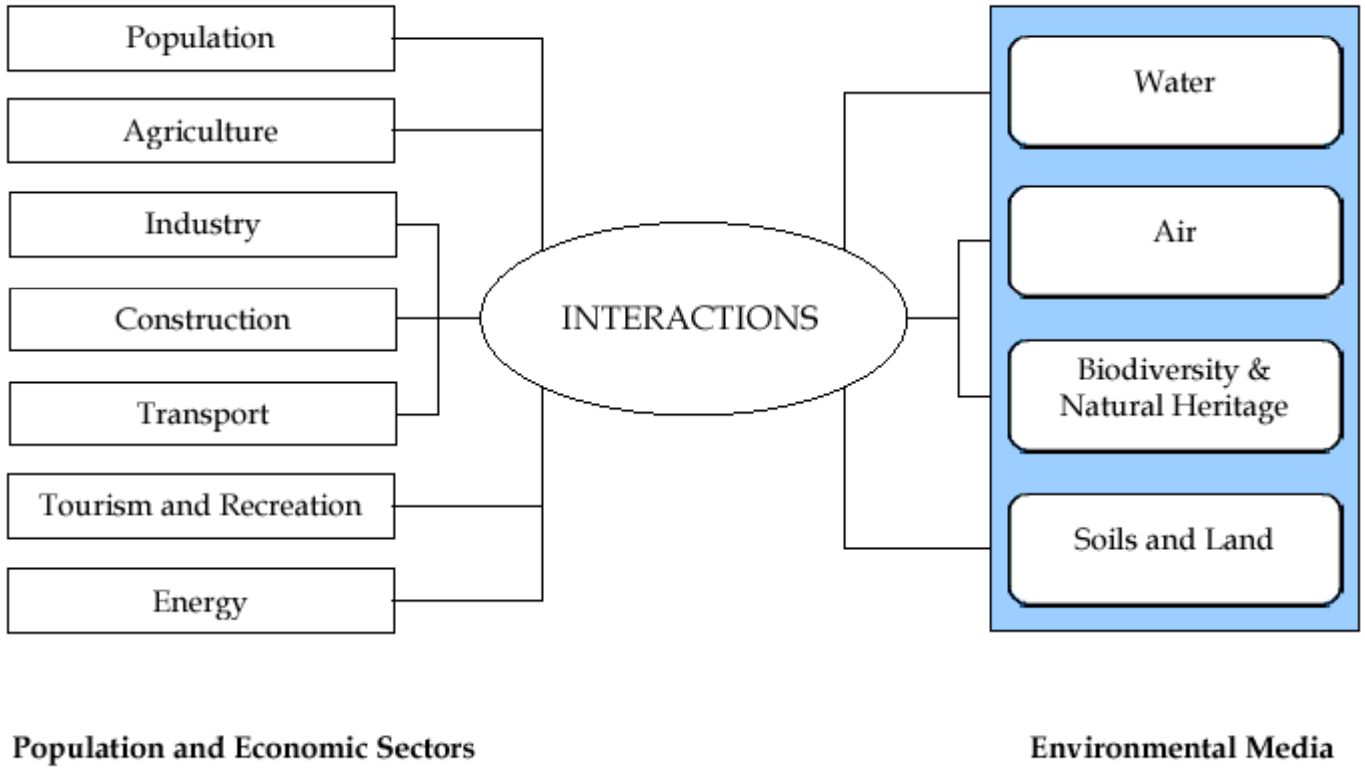


S.O.E.R. 2001 Table of Contents

Part

Lebanon SOE Report

Dual Framework Representation of Environment-Development Linkages



Lebanon State of Environment Report Mandate

- Prepared in response to the recommendations of Agenda 21
- Initiated by UNEP in association with the South Asia Co-operative Environment Programme and the Royal Government of Bhutan
- Financial support from Norwegian Agency for Development Co-operation
- National Environment Council (NEC) of the Bhutan government was the focal agency
- The Energy and Resources Institute (TERI) in India, a UNEP collaborating centre, provided technical support
- Report launched in 2001

Lebanon State of Environment Report Objective

- To identify the key priority environmental issues,
- Provide guidelines for environmental planning and policy development, and
- Identify alternative actions as options to offset negative environmental trends.

Lebanon State of Environment Report
Issues Assessed

- Rural urban migration
- Land degradation
- Air pollution
- Water pollution
- Solid waste management

Lebanon State of Environment Report Conclusions

- Bhutan government committed to "**middle path**" of sustainable development
- **Land degradation** is a priority issue for Bhutan
- **A strong conservation ethic** is contributing significantly to forest conservation
- **Air pollution** can be attributed to rapid urbanization, increasing industrial activities and vehicle numbers
- **Water quality** remains good, though could become vulnerable due to urbanization
- **Solid waste** management is an emerging issue

Lebanon State of Environment Report
Impact and follow-up

- Established an **environmental information system**
- Momentum and partial financial support gained for a second IEA report
- Second report now underway, and this time all resources and institutions involved are from Bhutan.

Emirate of Abu Dhabi

- **Mandate:** **T**he Emirate of Abu Dhabi State of the Environment Report was prepared as the Environment Agency - Abu Dhabi (EAD) is assigned the responsibility of producing the state of the environment report for the emirate of Abu Dhabi (State of the Environment Abu Dhabi, http://www.soe.ae).

- The process was initiated by EAD with technical support from UNEP-GRID and cooperation of numerous agencies during the development process.

- The report is intended to be a tool based on the latest information that assesses and reports on the condition of the environment as well as trends and emerging issues. It is to serve a variety of purposes such as:
- Informing policy makers on the development of new policies to improve the state of the environment
- Informing land and environmental managers, such as local governments, water authorities and others, to assist the development of appropriate management responses
- Informing environmental education programs; and providing easily understood and accessible information to the wider community about the state and condition of Abu Dhabi emirate’s environment.

Geographical scope

Overview map of Abu Dhabi Emirate

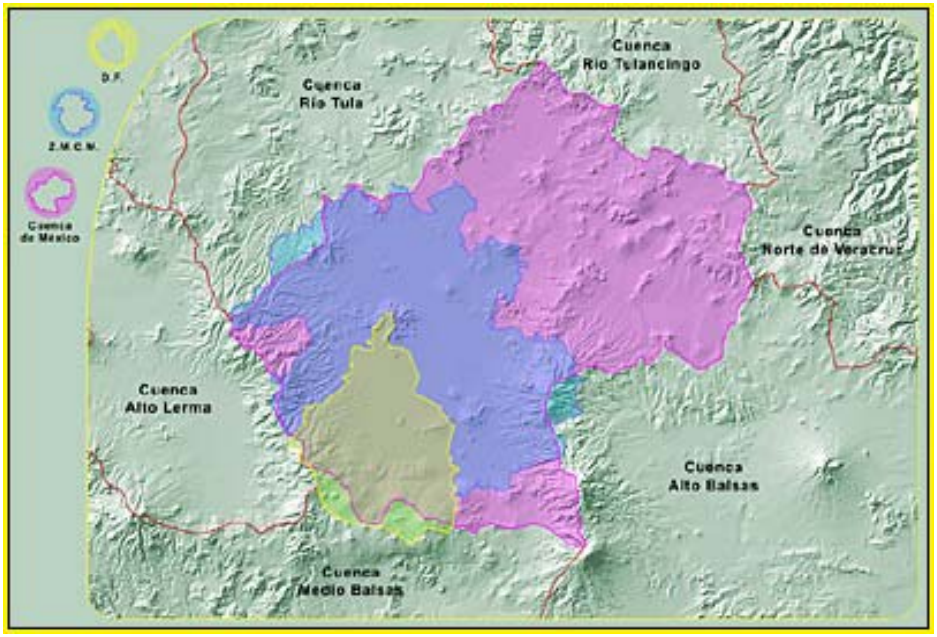
Source: National Atlas of the United Arab Emirates 1993, Abu Dhabi Marine Atlas 2003

Themes and issues

Major environmental themes assessed	Key environmental issues assessed
Atmosphere	Increasing air pollution
Biodiversity	Untreated hazardous waste
Land use	Land use change
Marine resources	Many species threatened
Water	Over fishing
Waste	Strain on heritage sites
Cultural heritage	Unsustainable water consumption

City Scale: Mexico City

- Largest urban area in Latin America and the Caribbean
- Completed a GEO Cities report
- Used a highly participatory process



GeoCities: Mandate

- Started in 2002 in response to calls by:
  - UNEP's Governing Council and the Global Ministerial Forum,
  - the Initiative for Sustainable Development in Latin America and Caribbean region,
  - the LAC Forum of Ministers, and
  - the Millennium Development Goals

GeoCities

- An initiative started in 2000 to **extend GEO** Assessment and Reporting **to the city level**
- More than 30 cities in the Latin and Caribbean region participate
- Discussions for similar programs in **Africa, Asia and the Pacific and Europe** are underway
- Possible cities include Nairobi, Lusaka, Dakar, Dhaka, Kathmandu and Shenzhen (China)

GeoCities: Summary of Objectives

1. Establish an IEA process;
2. Contribute to local capacity training on IEA in an urban context;
3. Establish consensus on the most critical environmental problems in each city; and,
4. Promote the creation of networks of institutions in each city assessed.

GEO Mexico City Process

- Process occurred from November 2001 to November 2003
- Specialist review in November 2002
- Consultation on final draft involved governmental officials, academics, representatives of NGOs and representatives of the private sector

GEO Mexico City Issues Assessed

- Urbanization is accelerating in an unorganized way; using land reserved for conservation
- Water resources are severely impacted;
- Air pollution is critical, as limits are exceeded 80% of the time
- Solid waste an emerging issue due to lack of space
- There exists a reasonably good amount of green space, though many are not managed

GEO Mexico City Conclusions

- Increased vulnerability resulting from loss of natural capital and degradation of environmental services.
- Risks resulting from inappropriate land use and technology;
- Daily impacts on health and well-being caused by environmental issues.
- Additional issues include population dynamics, unplanned land occupation, demand for water and consumption of energy.

GEO Mexico City Impact and follow-up

- A communications system
- A Report with user-friendly features:
  - Hyperlinks embedded for navigation
  - Thematic overlays for visualization of relationships among variables and influences
  - Web version allows users to update or add data to most recent information is available

GEO Mexico City Impact and follow-up

- Inclusion of the report and its findings in work and learning processes for different groups, such as academic, public and private institutions, through workshops;
- The environmental Ombudsman of Mexico recognizes the GEO Mexico City report and its findings as one of the principal sources of information and knowledge (NEXOS Magazine, January 2006);
- The Secretary of Environment used GEO Mexico City as a basic source to elaborate the city's Local Agenda 21 proposal;
- The United Nations Development Programme (UNDP) is using the GEO Mexico City report as a source of information for the elaboration of its new Human Development Report; and

Discussion: GEO Mexico City

- Where the findings surprising?
- Do you think they would be useful in setting policy?
- Are these findings different from what you would expect in your region?
- In what ways might you guide the process differently, if you were involved in a similar process, on a national scale?