

The Second Meeting of the Arab Working Group on “Environment and Sustainable Development Indicators ”

11-13 November 2012, Cairo, Egypt

أستخدام المؤشرات في التقييم البيئي المتكامل
حالة تقرير جيو الخامس

Use of Indicators in Integrated Environmental Assessment
The Case of GEO 5

د. أسماء علي أباحسين
جامعة الخليج العربي مملكة البحرين
asma@agu.edu.bh

www.unep.org/geo

Contents

- ✓ What is Assessment?.
- ✓ GEO: An Integrated Approach
- ✓ Role of Indicators in IEA
- ✓ DPSIR Framework in GEO5
- ✓ What are the new elements in GEO5
- ✓ GEO5 indicators Related Publications
- ✓ Conclusion.

Note: All photos are from GEO 5 and related publications



Featuring three integrated wind turbines, the Burj Khalifa World Trade Center boasts the world's most sophisticated skyscraper energy recovery system. © World Economic Forum

What is Assessment?

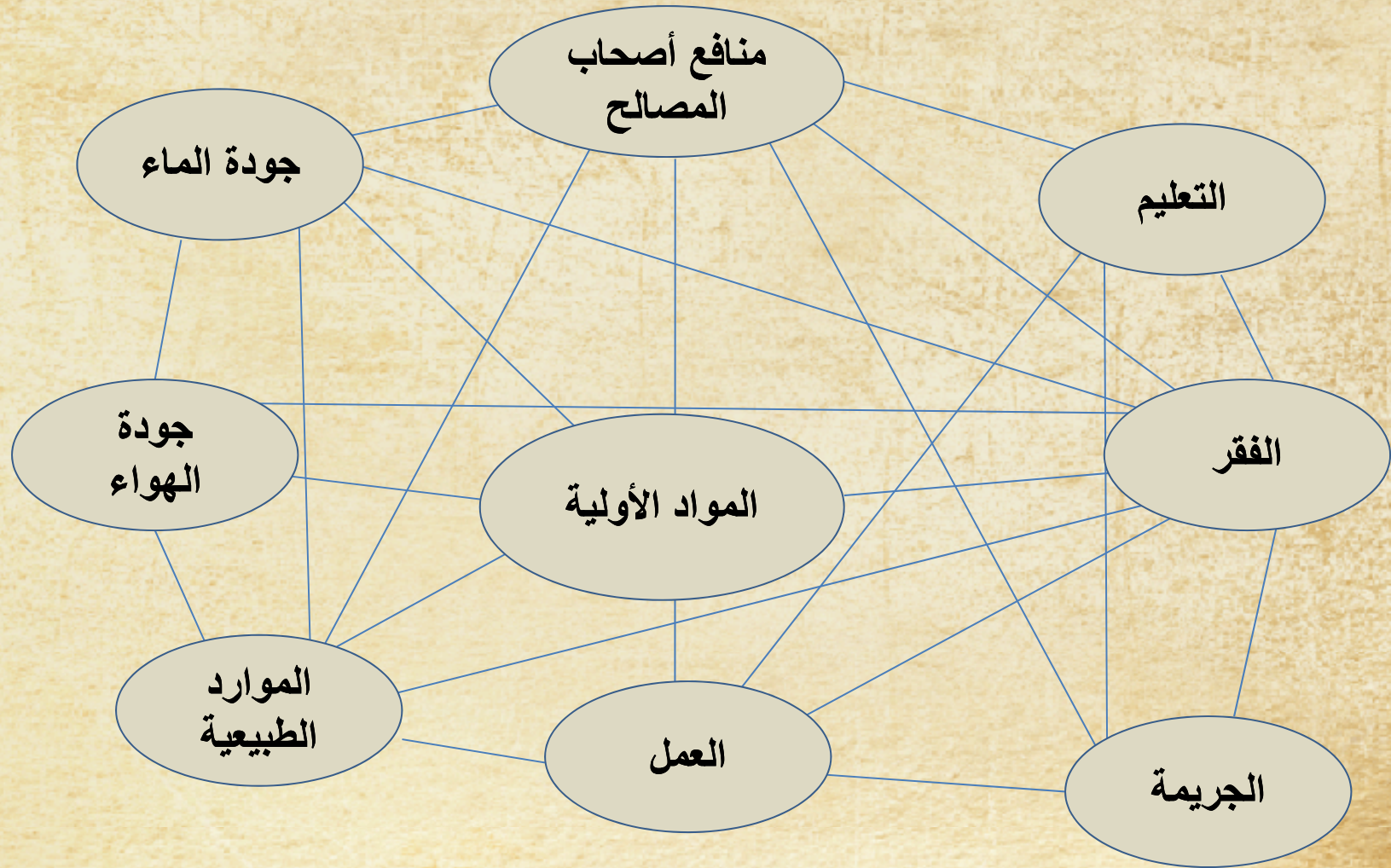
التقييم Assessment :

- عملية اجتماعية دورية شاملة تهدف إلى إجراء تقييم موضوعي متكامل قائم على تحليل البيانات والمعلومات البيئية لتلبية احتياجات المستفيدين، ودعم عملية اتخاذ القرار.

: Integrated Environmental Assessment

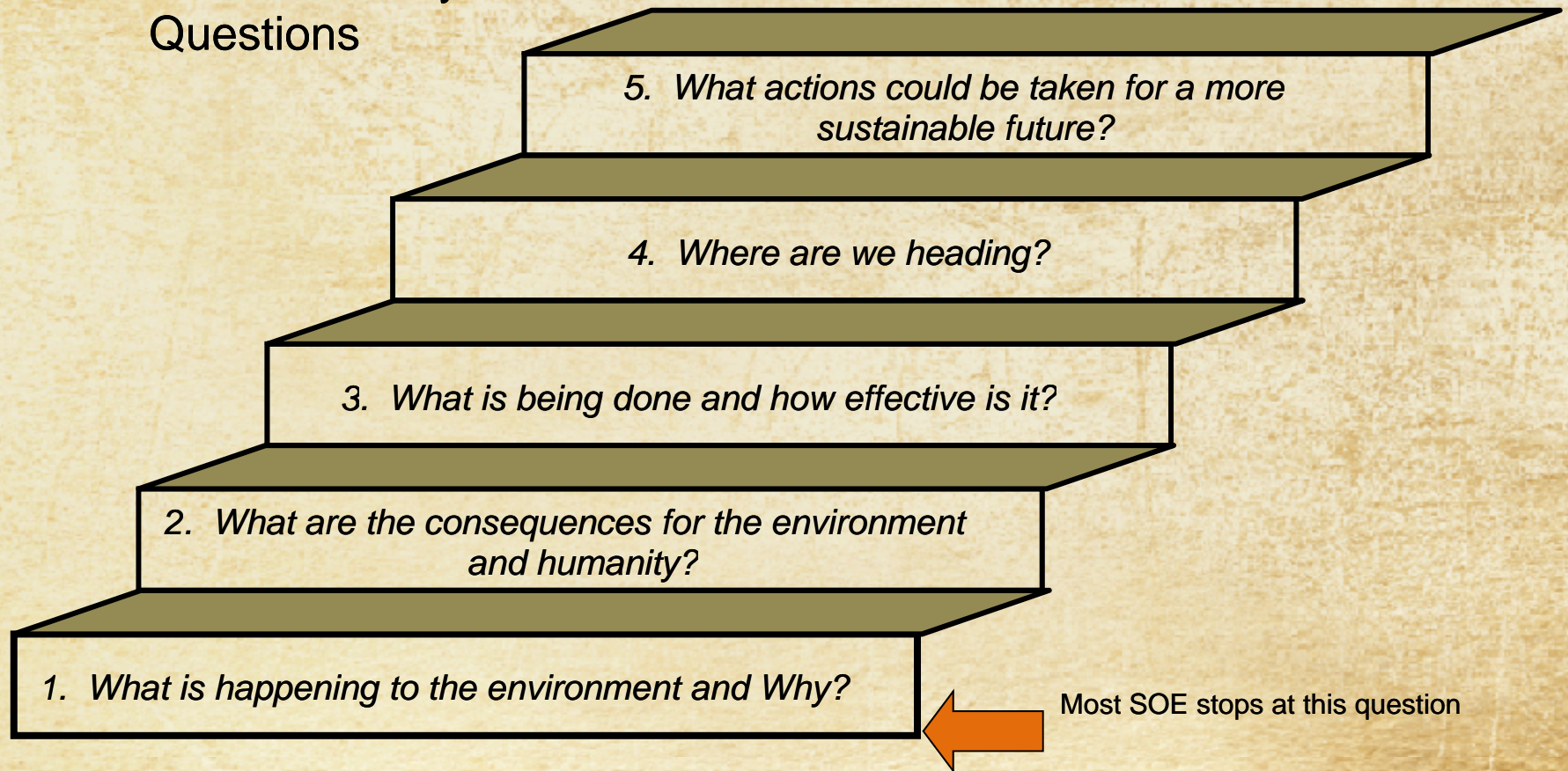
“the entire analytical process for undertaking a critical objective evaluation and analysis of data and information designed to meet user needs and support decision-making. It applies the judgment of experts to existing knowledge to provide scientifically credible answers to policy relevant questions,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

التعقيد في النظم



GEO: An Integrated Approach

Answers 5 Key Questions



IE. التقييم البيئي المتكامل

1. ماذا يحدث حالياً في البيئة؟ ولماذا؟

What is happening to the environment **S** and why **D & P**?

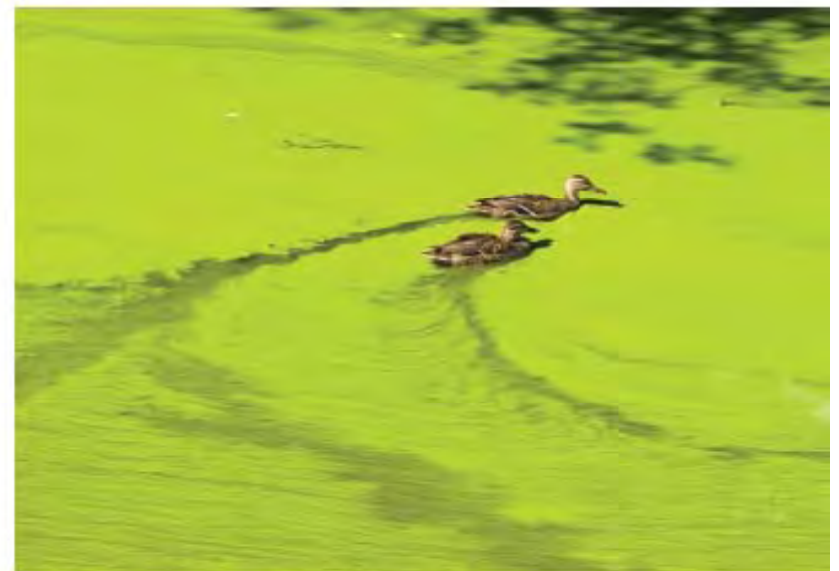


180

A farmer, wearing no protective equipment, sprays his vines with pesticide. © Allstar/Getty/Stock



The boom in global trade has led to significant emissions of CO₂ and key pollutants including SO_x, NO_x and black carbon from international shipping. © Mark Wragg/iStock

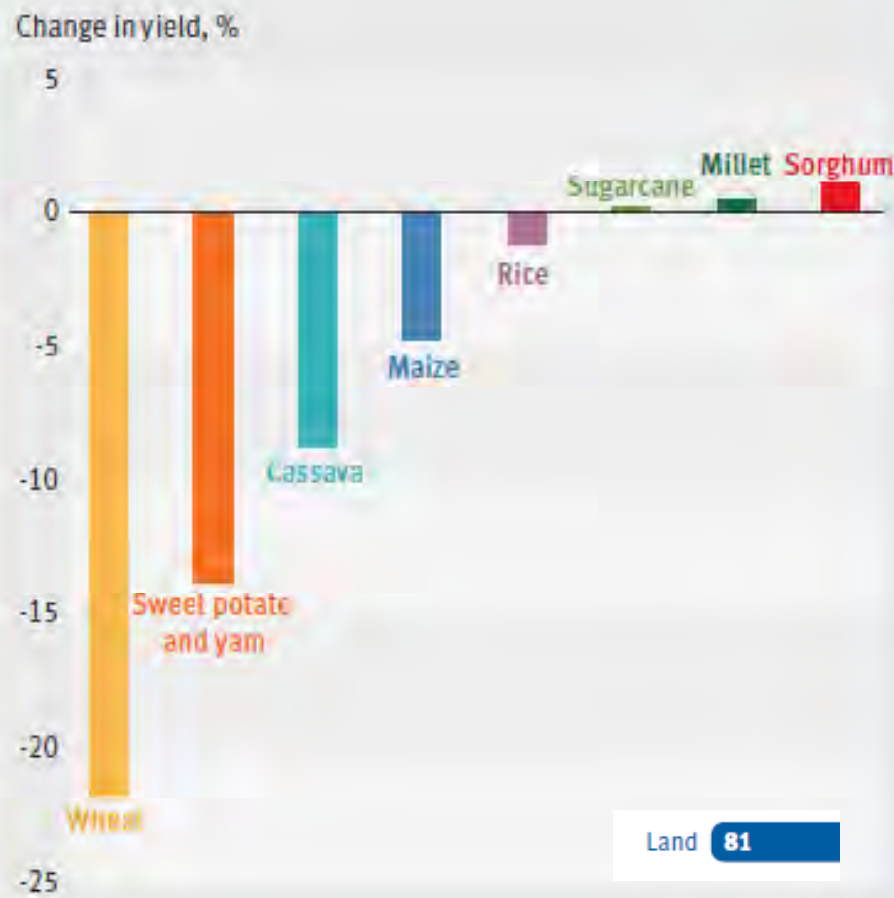


The eutrophication of this river is evident from the bright green water,

2. ماهي نتائج أو تبعات ما يحصل على البيئة والإنسان؟

- What are the consequences for the environment and humanity?

Figure 3.11 Projected changes in sub-Saharan African crop yields due to climate change, 2050

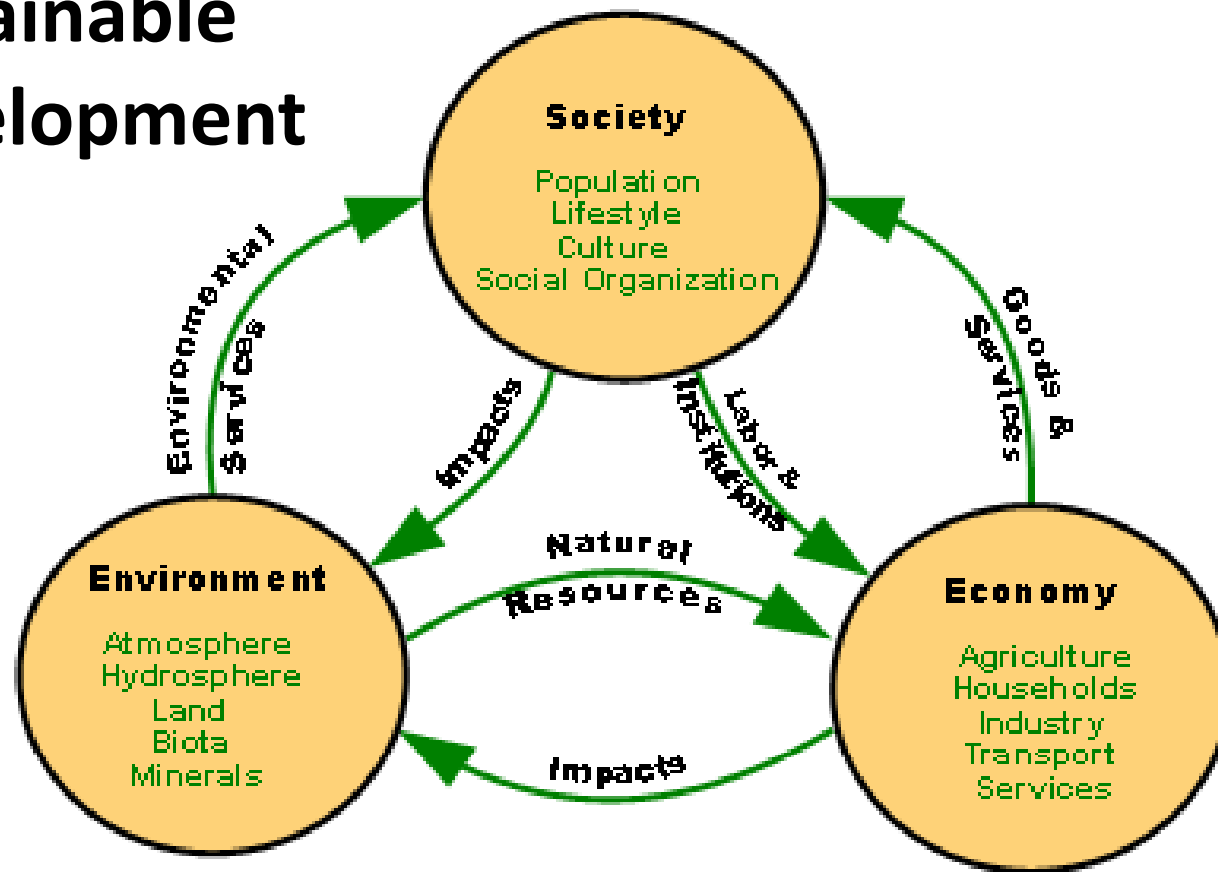


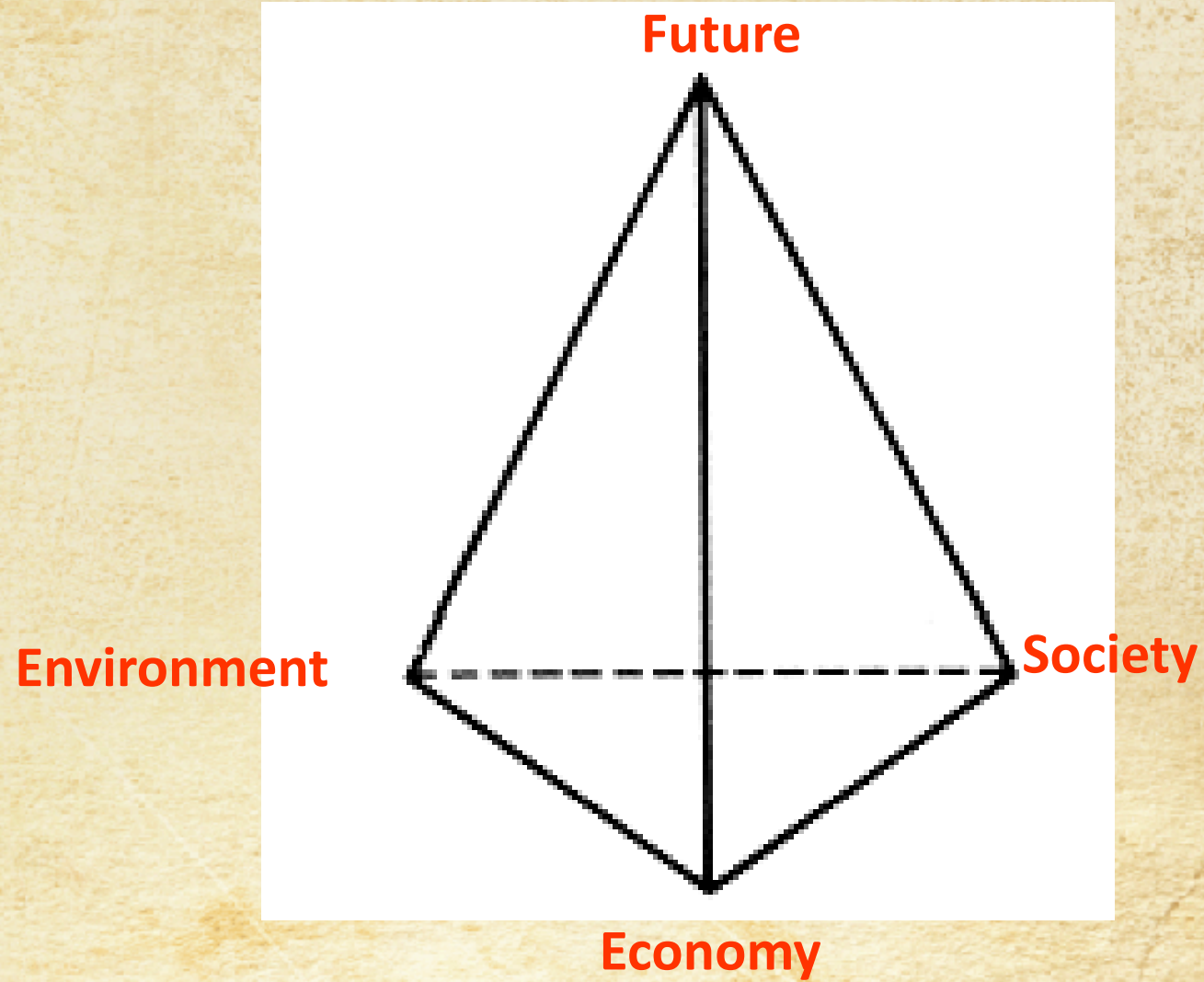
Impacts



A woman on her way to the water distribution site in Tora, Northern Darfur. The closest water source is more than an hour's walk from the village. © Olivier Chazotte/UN Photo

Sustainable Development





3. ماذا نعمل حالياً اتجاه ما يحصل ؟ وما مدى فعاليته؟

- What is being done and how is it effective?

Responses

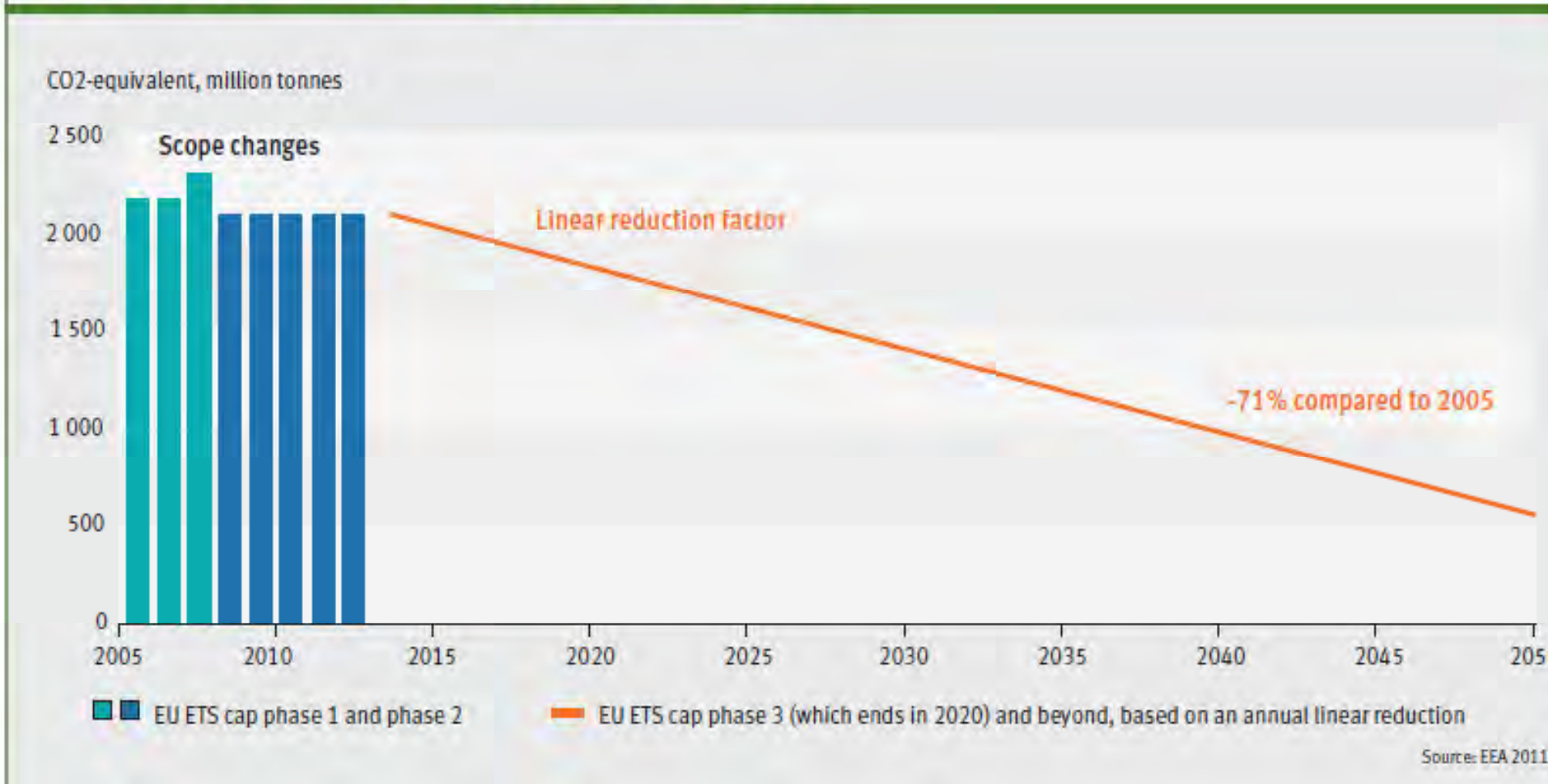


Recycling has multiple benefits for many areas of the economy.

4. إلى ماذا نطمح؟

- Where are we heading?

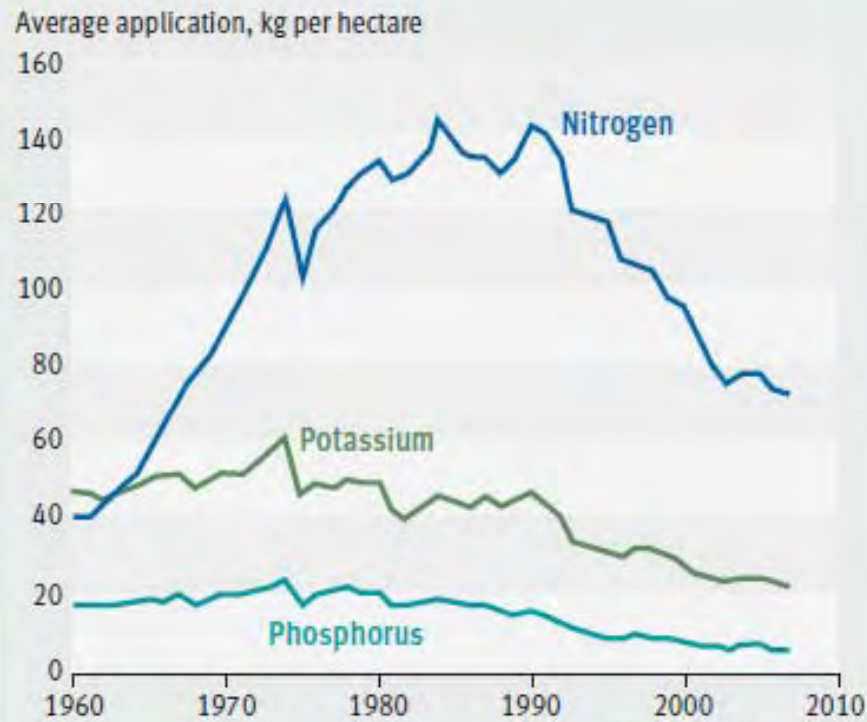
Figure 11.2 EU Emissions Trading System cap, 2005–2050



5. ماذا يمكن أن نعمل، أو ما هي الافعال التي بالإمكان القيام بها لمستقبل أكثر استدامة؟

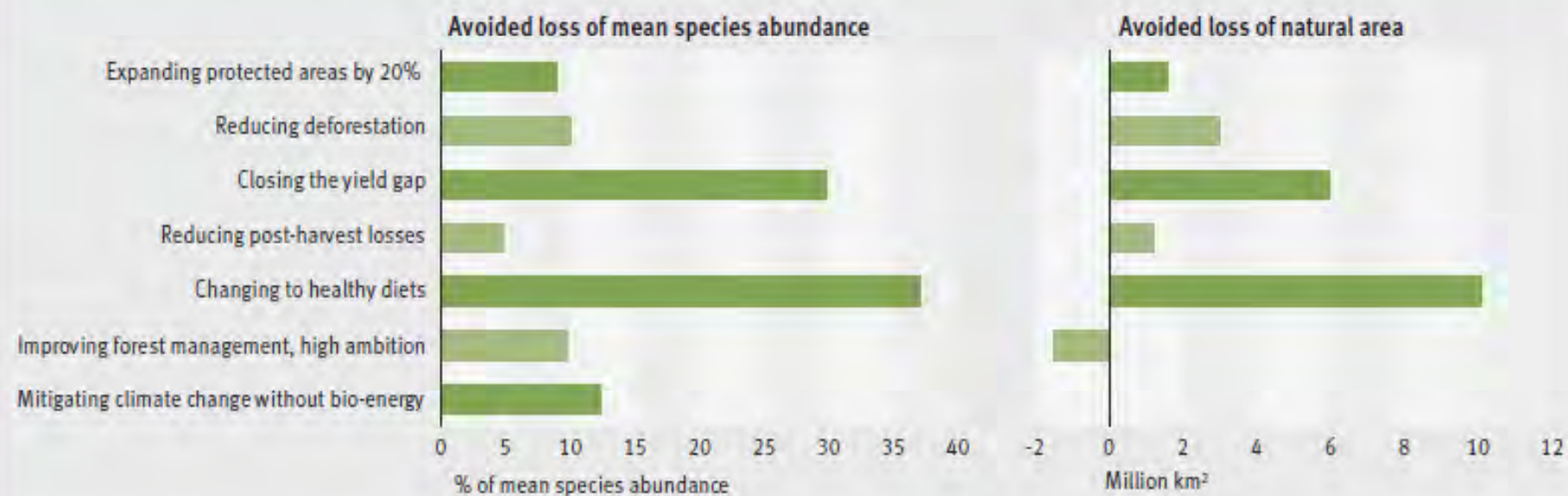
- What actions could be taken for a more sustainable future?

Figure 11.8 Agricultural use of nitrogen (N), phosphorus (P) and potassium (K) in Denmark, 1960–2007



Farmland in Denmark, where the agricultural use of nitrogen has dropped by more than 50 per cent since 1990. © Bjørn Rasmussen/iStock

Figure 16.14 Options for reducing biodiversity loss by 2050



Note: Mean species abundance is the average relative to the original state.

Source: Ten Brink et al. 2010



In its simplest expression, a green economy can be thought of as one which is low carbon, resource efficient and socially inclusive. © Mas Kordakos



يقوم مفهوم التقويم البيئي المتكامل على رؤية جديدة للمواضيع والقضايا البيئية يتم فيها:

- وصف حالة البيئة.
- تبيان اتجاهات هذه الحالة.
- ربط حالة البيئة بجذور المشكلة والضغوط المسببة لها.
- تبيان آثار هذه الحالة
- العلاقة بين حالة البيئة والسياسات الحالية التي من شأنها تعديل هذه الحالة، أو تلك التي قد تفاقمها مستقبلاً.
- إعطاء صانعي القرار والمجتمع المعني صورة متكاملة عن الوضع البيئي واتجاهاته و ما تتعرض له البيئة من ضغوط، والأسباب والسياسات التي أدت إلى ذلك، والسبل المتاحة لتصحيح هذا الوضع.

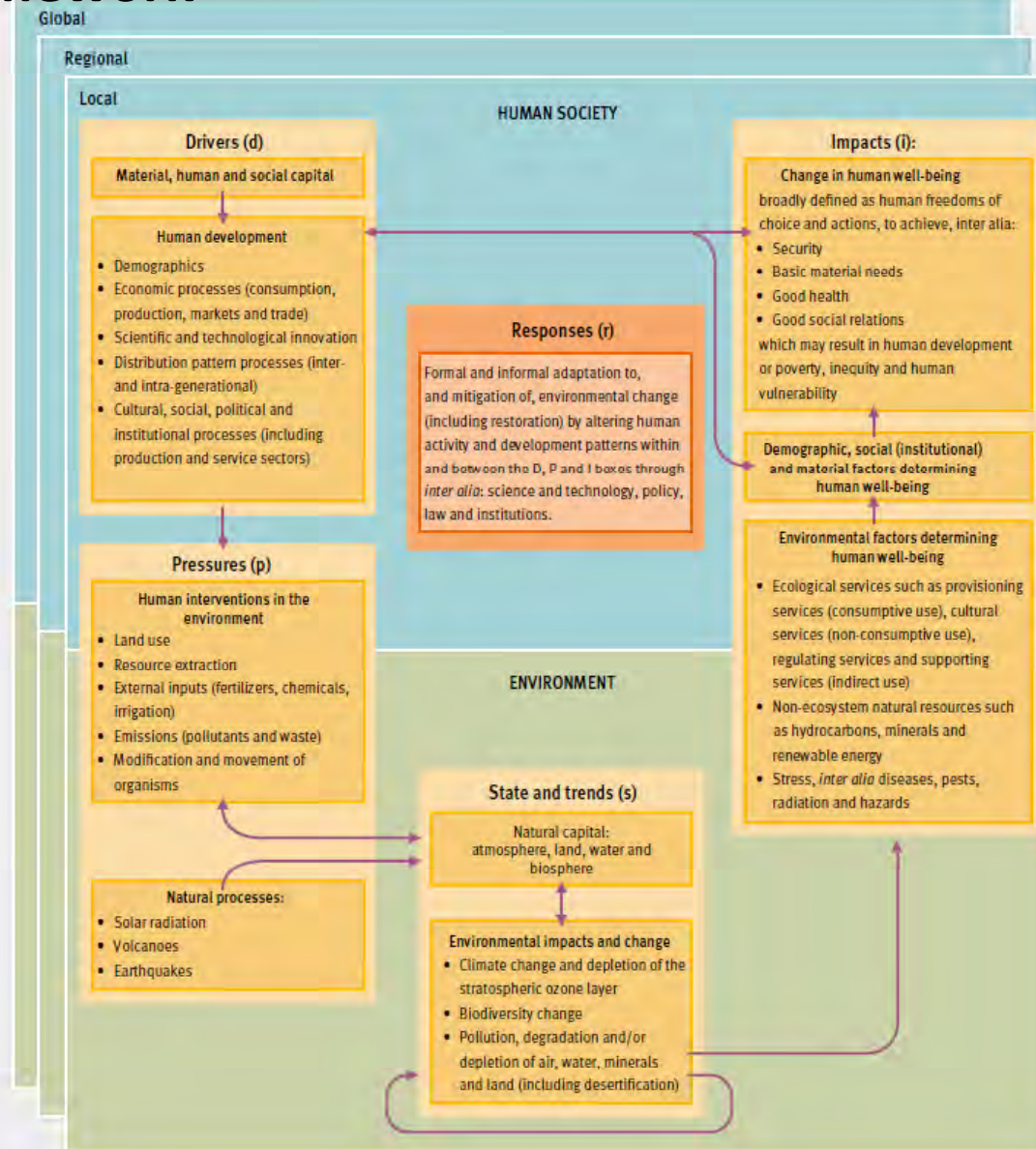
و لاتمام التقييم البيئي لابد من توفر أدوات لرصد التغير وقياسه، وإجراء
التقسم والمتابعة.

وتشكل المؤشرات البيئية تلك الأدوات،

- تلخص حالة البيئة واتجاهاتها؛
- تعرف المشاكل البيئية؛
- تمكن من المقارنة عبر الأماكن والزمن؛
- تساعد في تحديد الأولويات؛
- تعتبر المؤشرات وسيلة لمتابعة التطبيق لسياسة ما ، وتقيس التحسن في تحقيق الأهداف؛
- من خلالها يمكن بناء التوقعات المستقبلية لحالة البيئة؛
- تقديم معلومات للإنذار المبكر.

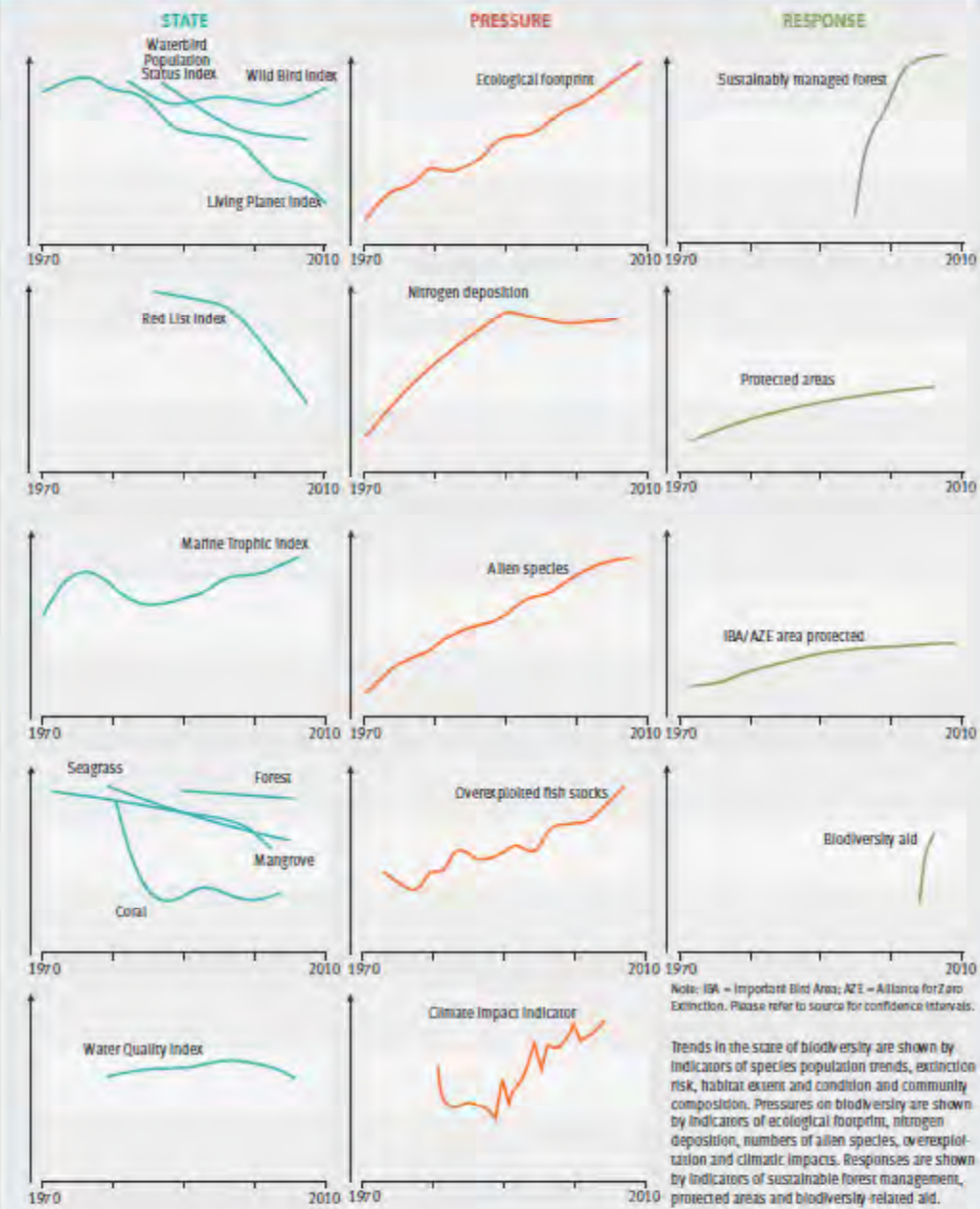
DPSIR framework

Figure 1 The GEO-5 DPSIR conceptual framework



Source: 2012 United Nations Environment Programme DEWA/ GRID-Geneva

Figure 5.2 Biodiversity Indicator trends



Source: Adapted from Luckhurst et al. 2010



State of Environment Reporting

It is a tool to provide integrated, comprehensive information required to support and improve decision making, and to inform the public.

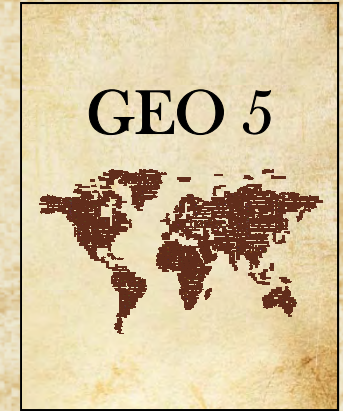
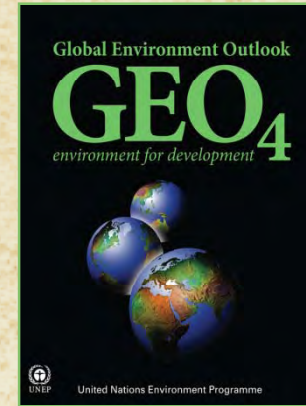
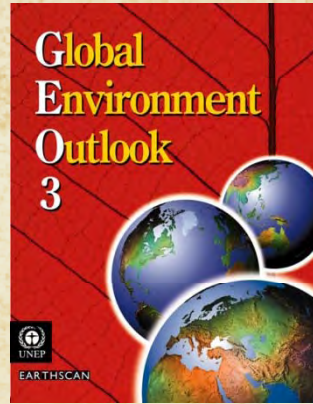
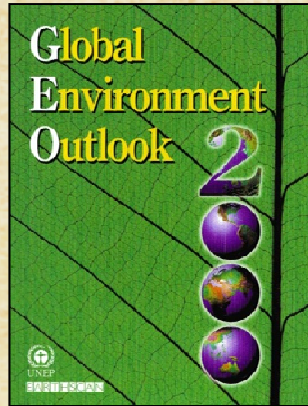
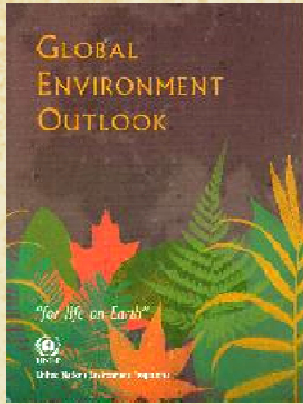
Why undertake an environmental assessment? (Paul Rump 1996)

- **Public awareness:** inform people of the significance of the environment in their daily lives, focus their attention on priority issues
- **Education:** provide source material for academic and less formal environmental education for all age groups
- **Policy development:** produce environmental information essential for the formulation and implementation of sustainable development policy
- **Performance assessment:** provide essential information to facilitate public and private sector accountability of policy and development performance
- **Scientific benchmark:** provide a baseline against which future assessments can be compared

Target Audience

- **Governmental / Decision maker**
- **Print and Mass media**
- **Professional groups, farmers, fishermen etc**
- **Women's association and other social associations.**
- **Religious organizations**
- **Educational Institutions**
- **Business/ industries/ corporate sectors**
- **General Public**

The Global Environment Outlook Series



Lunched June 2012

A Process:

Multi-disciplinary, engaging partners, collaborating centres, science and policy experts worldwide and building capacity for developing countries



United Nations Environment Programme
environment for development

Google™ Custom Search

[About UNEP](#)

[News Centre](#)

[Multimedia](#)

[Publications](#)

[E-Calendar](#)

[Outreach](#)

[Priority Areas](#)

REGIONAL NOMINATION
PORTAL

GEO
PRODUCTS

LATEST
NEWS

GEO
REGIONS

GEO
DATA PORTAL

GEO-5
MEETINGS

SELECTED
EXPERTS

GEO
PROCESS

GEO-5
CAPACITY BUILDING

GEO-5
PARTNERS

GEO ASSESSMENT
MANUAL

CONTACT US

<http://www.unep.org/geo>

UNEP in the Regions

- Africa: Nairobi, Kenya
- Asia and the Pacific: Bangkok, Thailand
- Europe: Geneva, Switzerland
- Latin America and the Caribbean: Panama City, Panama
- North America: Washington DC, USA
- West Asia: Manama, Bahrain

Resources for

- Business Persons
- Children & Youth
- Civil Society
- Governments
- Journalists
- Scientists
- Contacts
- Resource Kit
- Site Locator
- Support UNEP
- UN and the Environment
- UNEP Intranet



GEO



OARE



tematea

tv/e

Follow Us on:



Copyright © United Nations Environment Programme [[Privacy](#)] [[Terms and Conditions](#)]

- التركيز على السياسات التي بالامكان تكرارها وتعميمها Replicate & Upscale
- تسليط الضوء على الاهداف التي تم الاتفاق عليها دوليا ومنها الاهداف الانمائية للالفية خاصة الهدف السابع "ضمان الاستدامة السئة " ، الهدف الاول القضاء على الفقر المتقع و الجوع.

Box 2.1 Climate change

Related goals

Prevent dangerous anthropogenic interference with the climate system (UNFCCC)

Indicators

Temperature trends; rainfall changes; sea ice extent; CO₂ concentrations; greenhouse gas emissions

Global trends

Slow progress; not on track to avoid crossing UNFCCC's agreed temperature rise limit of 2°C

UN Millennium Development Goal-7

Goal 7: Ensure environmental sustainability targets	<i>indicators</i>
Target 7.A: Integrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources	7.1 Proportion of land area covered by forest 7.2 CO2 emissions, total, per capita and per \$1 GDP (PPP) 7.3 Consumption of ozone-depleting substances
Target 7.B: Reduce biodiversity loss, achieving, by 2010, a significant reduction in the rate of loss	7.4 Proportion of fish stocks within safe biological limits 7.5 Proportion of total water resources used 7.6 Proportion of terrestrial and marine areas protected 7.7 Proportion of species threatened with extinction
Target 7.C: Halve, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation	7.8 Proportion of population using an improved drinking water source 7.9 Proportion of population using an improved sanitation facility
Target 7.D: By 2020, to have achieved a significant improvement in the lives of at least 100 million slum dwellers	7.10 Proportion of urban population living in slums

٥ - تعزيز سياسات وممارسات واعدة ومحسنة من الأقاليم

أهمية تكرار وتوسيع نطاق السياسات الناجحة في الإقليم والعالم

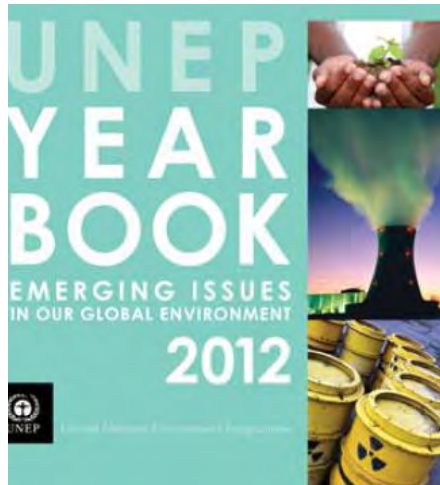
✓ التعرف على ما الذي يجعل سياسة ما ناجحة؟

✓ وما هي العوامل المواتية للسياسات؟

✓ وما هي العوائق الرئيسية لتنفيذ سياسة ما؟

✓ ما يجب القيام به لتفعيل السياسة؟

Replicate and Upscale



UNEP YEAR BOOK

Key Environmental Indicators

Indicators help to assess the overall outcomes of complex interactions between people and the environment. The latest environmental data and trends show progress in addressing stratospheric ozone depletion, the uptake of renewable energy technologies, and the increasing use of environmental certification schemes. Global carbon dioxide emissions are still rising. Pressures on ecosystems from natural resource use persist, with notable impacts in terms of biodiversity loss.

Indicators can help tell us if problems are getting better or worse and if policy measures appear to be having an effect. For example, the rate of melting of mountain glaciers tells us something about atmospheric warming, while reduced production of ozone depleting substances indicates that countries are successfully phasing them out. However, indicators are no more than that—they indicate trends or report on the state of a single environmental component such as forest cover. Indicators do not explain underlying causes, nor does a lack of significant change

mean that no efforts have been made to address a problem. However, indicators can point out where further examination is needed.

Regular indicator-based assessments continue to be pivotal for presenting the bigger picture in regard to progress made towards achieving environmental sustainability. Every five years, the UNEP Global Environment Outlook (GEO) takes a comprehensive look at the state of and trends in the environment.

An overview of major global and regional trends is presented in this section, illustrated with 20 specially prepared graphics. According to the overall picture that emerges, in a few areas—such as stratospheric ozone depletion, renewable energy use and forest certification—there are signs of progress. Nevertheless, many pressures on the environment are continuing to persist. The rapid loss of both terrestrial and marine biodiversity is of particular concern, as highlighted in a number of recent publications (Butchard et al. 2010, SCBD 2010).

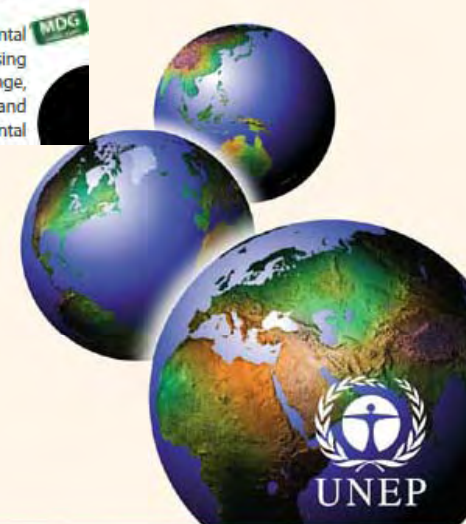
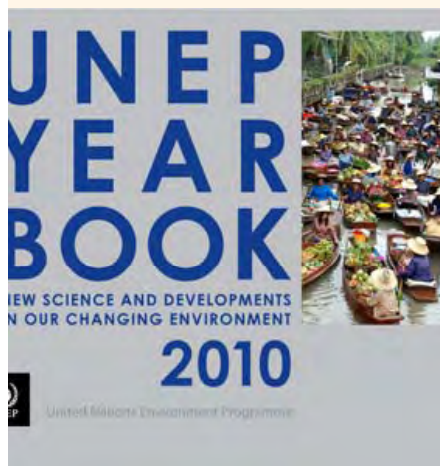
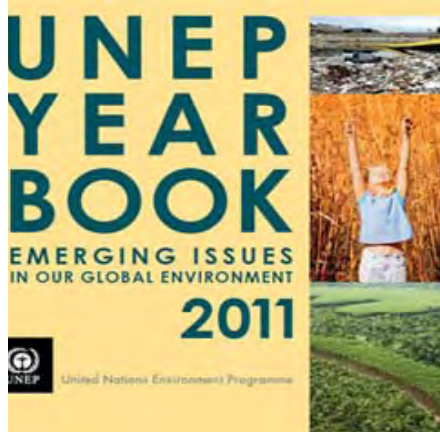
As in the case of the MDGs, this type of 'global environmental snapshot' can serve to draw attention to the most pressing issues and monitor major trends in areas such as climate change, freshwater quality, use of natural resources, biodiversity loss and environmental governance. Poor availability of environmental

Indicators are measures—generally quantitative—that can be used to illustrate and communicate complex phenomena in a simple way, including trends and progress over time (EEA 2005).

Index is a composite of several indicators.

Data source refers to the organization which prepared and provided the data.

MDG An indicator that is included in the suite of indicators to track progress towards achieving the



CHAPTER 8

Review of Data Needs

MEASURING PROGRESS

Environmental Goals & Gaps



CMS
JPOI
Basel Convention
UNCLOS
Global E
Rio Earth Sun
Sustainable Develo
Drink



Contributing authors: Charles Davies, Ashbindu S

Principal scientific reviewer: Palmer M. Krug

This chapter has been prepared by the Secretariat

KEEPING TRACK of our changing environment



12% biodiversity decline globally
+60% women parliamentarians
+130% plastics production
Ozone depleting substances -93%
13% renewable energy sources
21 megacities
300 million ha forest area loss
+0.4°C in global mean temperature
Globalization
+75% GDP
36% increase in CO₂ emissions
efficiency
Ocean Acidity 8.11 - 8.06 pH
Population +26%
drinking water coverage +13%
slum dwellers +171 million
global warming
sustainability
energy
technology



From Rio to Rio+20 (1992-2012)

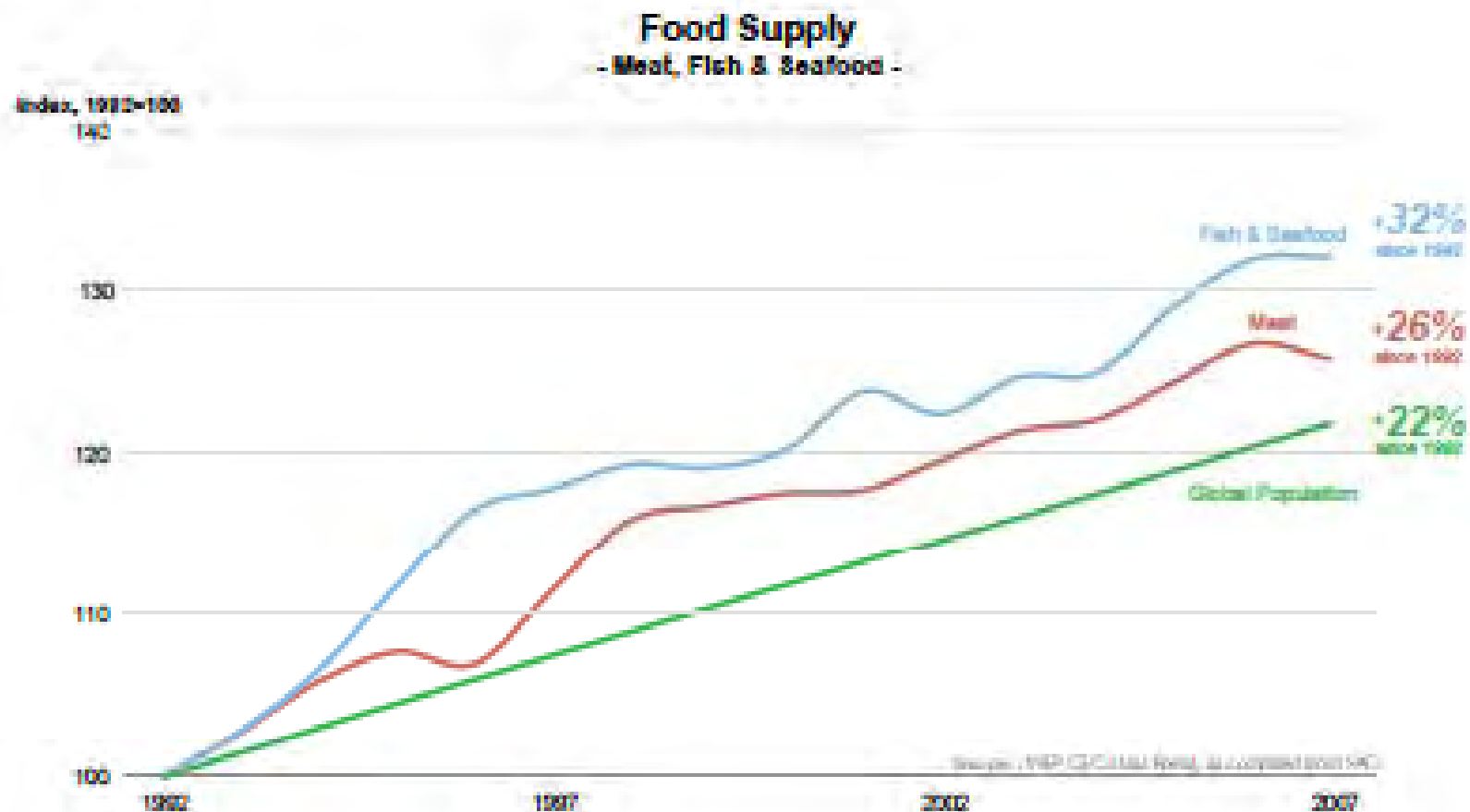
Main Messages

- **Global research programmes and rapidly improving technologies for collecting environmental information and presenting it in engaging ways are informing the debate about present and future environmental challenges.**
- **Nevertheless, deficiencies in scientifically credible data on the environment – in particular time series on such issues as freshwater quantity and quality, groundwater depletion, ecosystem services, loss of natural habitat, land degradation, and chemicals and waste – are a major handicap in developing evidence-based policies.**
- **Official environment statistics is still an emerging field, with poor availability and quality of data in many countries.**
- **Capacity development to support environmental information, especially in developing countries, needs to be stepped up significantly.**
- **International cooperation is essential, since environmental problems do not follow national Boundaries.**
- **Adequate information does exist to develop effective environmental policies; data gaps rarely justify inaction.**
- **More systematic data collection efforts can help governments to assess their progress towards**

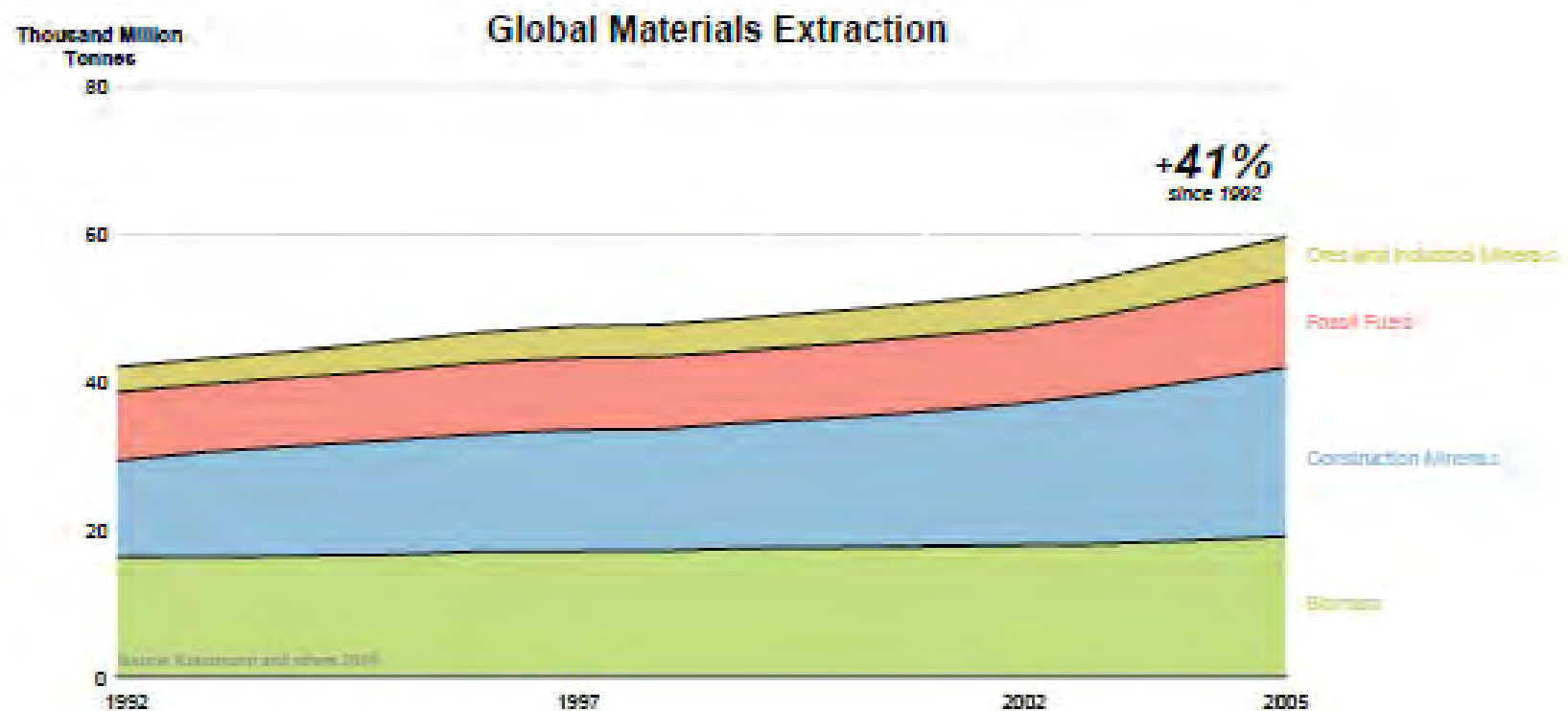
الرسائل الرئيسية Main Messages

- حصل تطور كبير في التقنية الخاصة بجمع البيانات البيئية وطريقة عرضها بصورة تشاركية وبخاصة تلك التي تمثل تحديات بيئية
- رغم ذلك لا يزال هناك نقص في البيانات ذات المصادقية العلمية حول البيئة وبخاصة ذات السلاسل الزمنية الطويلة وبخاصة في قضايا البيانات المتعلقة بجودة المياه العذبة وكمياتها، تدهور المياه الجوفية، خدمات النظم البيئية، تدهور الموائل، والراضي، والموا الكيماوية والنفايات . مما يعد معوقا لوضع سياسات مبنية على الدلائل.
- لا تزال قضية الاحصاءات البيئية قضية صاعدة نظرا لضعف نوعية البيانات في العديد من الدول، وهناك حاجة لبناء القدرات في المعلومات البيئية في الدول النامية والنهوض بها.
- الجهود باتجاه الجمع المنظم للبيانات البيئية يمكن أن يساعد الحكومات لتقييم تقدمهم باتجاه تحقيق الأهداف العالمية وتحسين سياساتهم ورصد آثارها وتوجيه مواردهم المحدودة باتجاه التحديات البيئية الأكثر إلحاحاً.

*The average global citizen consumes 43 kg
of meat per year, up from 34 kg in 1992*



As societies grow and become wealthier, demand for basic materials is further increasing

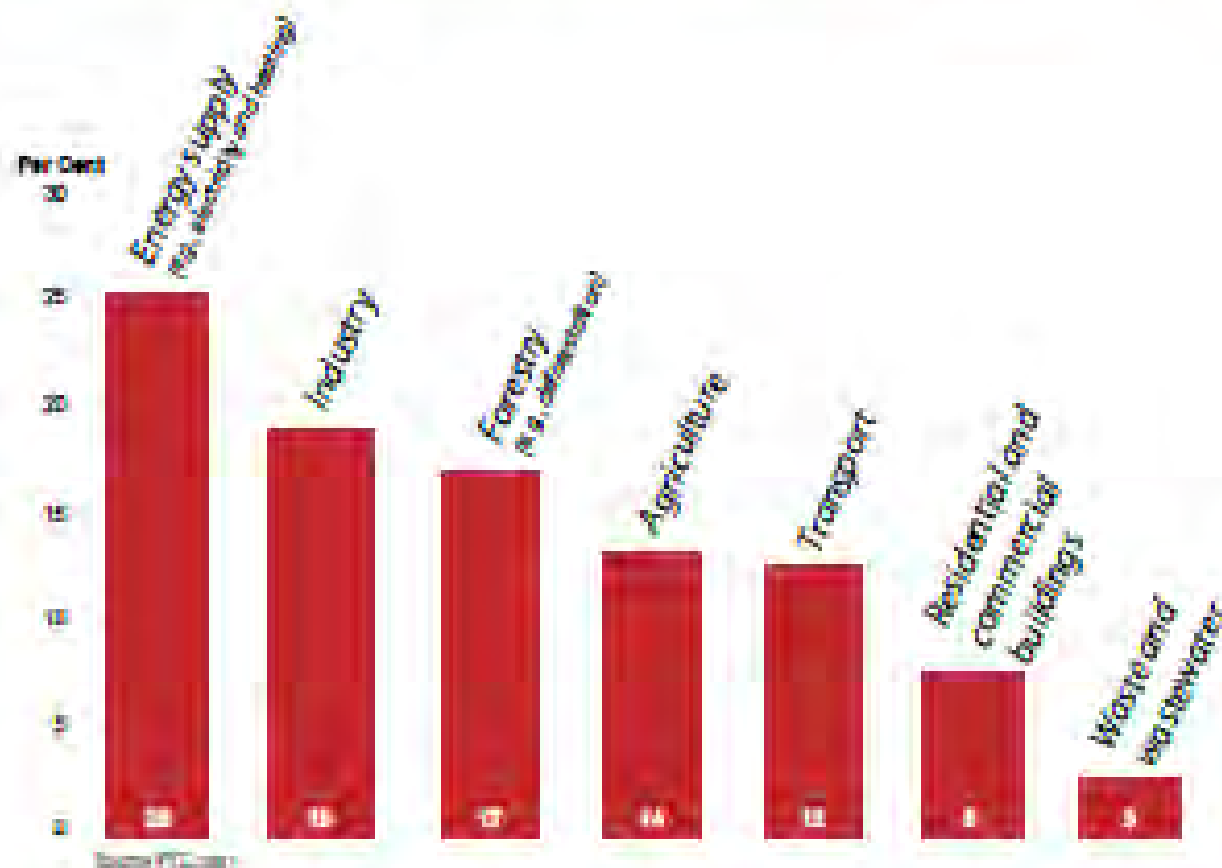


The global use of natural resource materials increased by over 40% between 1992 and 2005, from about 42 to nearly 60 thousand million tonnes. On a per capita basis, the increase was 27%. Among the four major material groups (biomass, fossil fuels, ores and industrial minerals, and construction minerals) there has been a major increase in extraction of

*Over 60% of Greenhouse Gases are
emitted by three economic sectors*

Which sectors emit the most Greenhouse Gases?

Per Cent contribution to global anthropogenic GHG emissions, 2004



Improve the efficient use of water resources and promote their allocation among competing uses in a way that gives priority to the satisfaction of basic human needs...

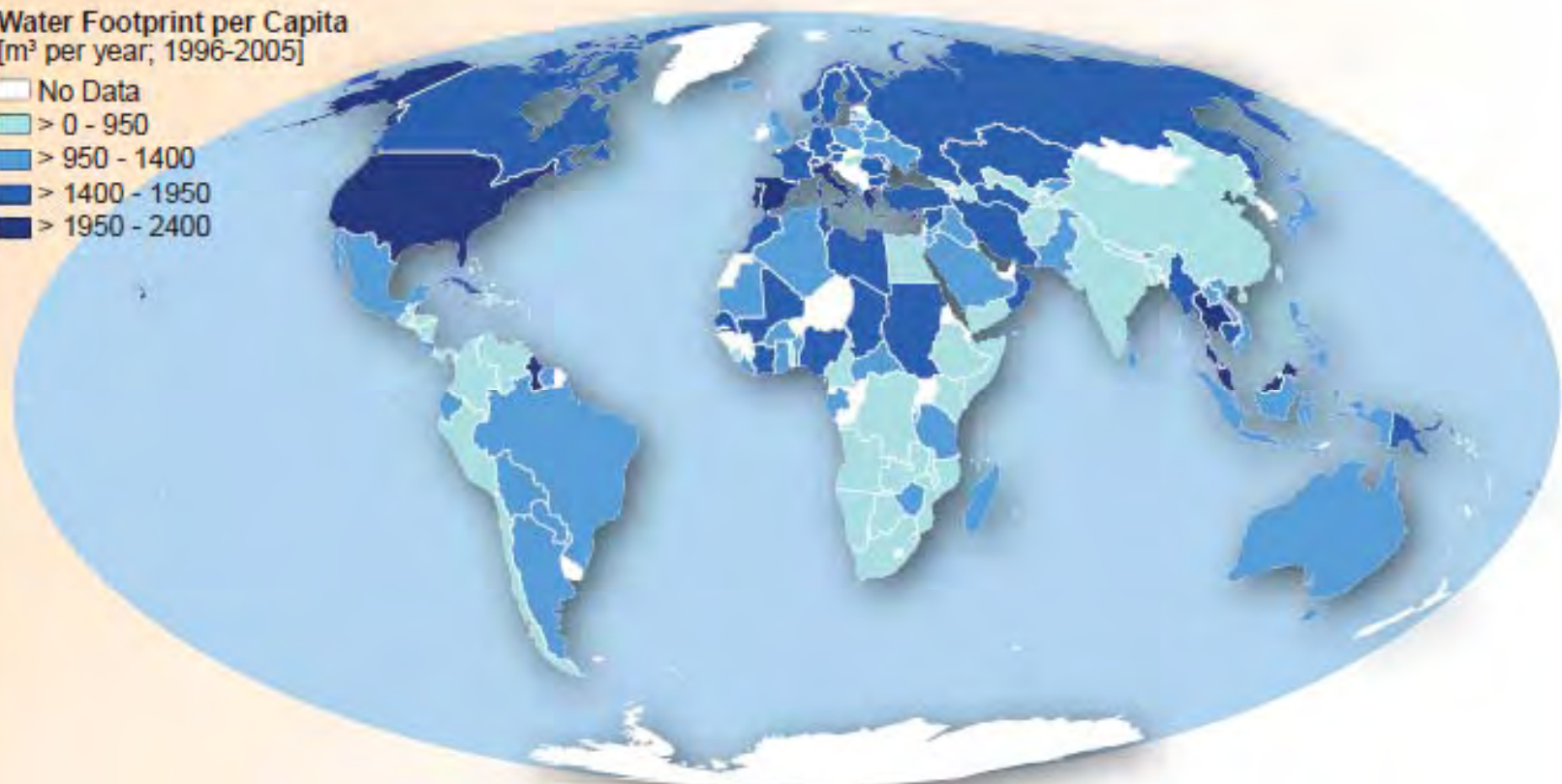
Johannesburg Plan of Implementation, para. 26(c)



some progress

Water Footprint per Capita
[m³ per year, 1996-2005]

- No Data
- > 0 - 950
- > 950 - 1400
- > 1400 - 1950
- > 1950 - 2400



Source: UNEP Environmental Data Explorer, as compiled from Water Footprint Network

Per capita water footprint: The total volume of freshwater that is used to produce the goods and services consumed by an individual.

To stop the unsustainable exploitation of water resources by developing water management strategies at the regional, national and local levels, which promote both equitable access and adequate supplies

Millennium Declaration, General Assembly resolution 55/2 of 18 September 2000, para. 23



little or no progress on groundwater pollution and monitoring
further deterioration on groundwater supply

Annual Groundwater Depletion

Million m³/year
Year: 2000



٢ - تقرير السياسات القائمة على الأدلة يتطلب المزيد من البيانات الموثوقة

يُعد الافتقار إلى بيانات موثوقة ومتسقة ومسلسلة زمنياً عن حالة البيئة عقبة رئيسية بالنسبة لزيادة فعالية السياسات والبرامج. وعلاوة على ذلك، فإنه لا يجري رصد الكثير من أهم العوامل المحركة للتغير البيئي أو حتى تأثيراتها بصورة منهجية. وينبغي لجميع البلدان القيام برصد وتقييم بيئتها الخاصة وإدماج المعلومات الاجتماعية والاقتصادية والبيئية لإثراء عمليات صنع القرار. ونظراً لأنه يلزم نهج موحدة لجمع البيانات، فإنه يجب تعزيز التعاون الدولي وبناء القدرة على جمع البيانات. ويُعد تحسين الحصول على المعلومات أساسياً أيضاً.

الخلاصة CONCLUSIONS

- يجب أن تركز التقييمات البيئية السليمة على البيانات البيئية والاجتماعية والاقتصادية عالية الجودة ذات المصداقية العلمية .
- البيانات البيئية مهمة أيضا لرصد آثار السياسات والبرامج البيئية.
- الأولويات الحالية والمستقبلية تشمل استخدام معايير موحدة لجمع البيانات وتحليلها، وزيادة تبادل البيانات، تكوين سلسلة زمنية من بيانات الرصد، وبناء القدرات لتعزيز الإحصاءات البيئية في الدول، وتسخير التكنولوجيات الجديدة لتوصيل المعلومات البيئية بشكل فعال إلى واضعي السياسات والجمهور.
- Sound environmental assessments must be underpinned by high-quality scientific environmental, social and economic data. Environmental data are also important to monitor the impacts of environmental policies and programmes. Ongoing and future priorities include the use of common standards for data collection and analysis, increased data sharing, consistent time series of environmental observations, capacity building to strengthen environment statistics in a wider range of countries, and harnessing new technologies to communicate environmental information effectively to policy makers and the public.

Sustainable development indicators

Indicators

Socio-economic development
Sustainable consumption and production
Social inclusion
Demographic Changes
Public Health
Climate Change and Energy
Sustainable Transport
Natural Resources
Global Partnership
Good Governance

Complete set of indicators

Context

Strategies and policies

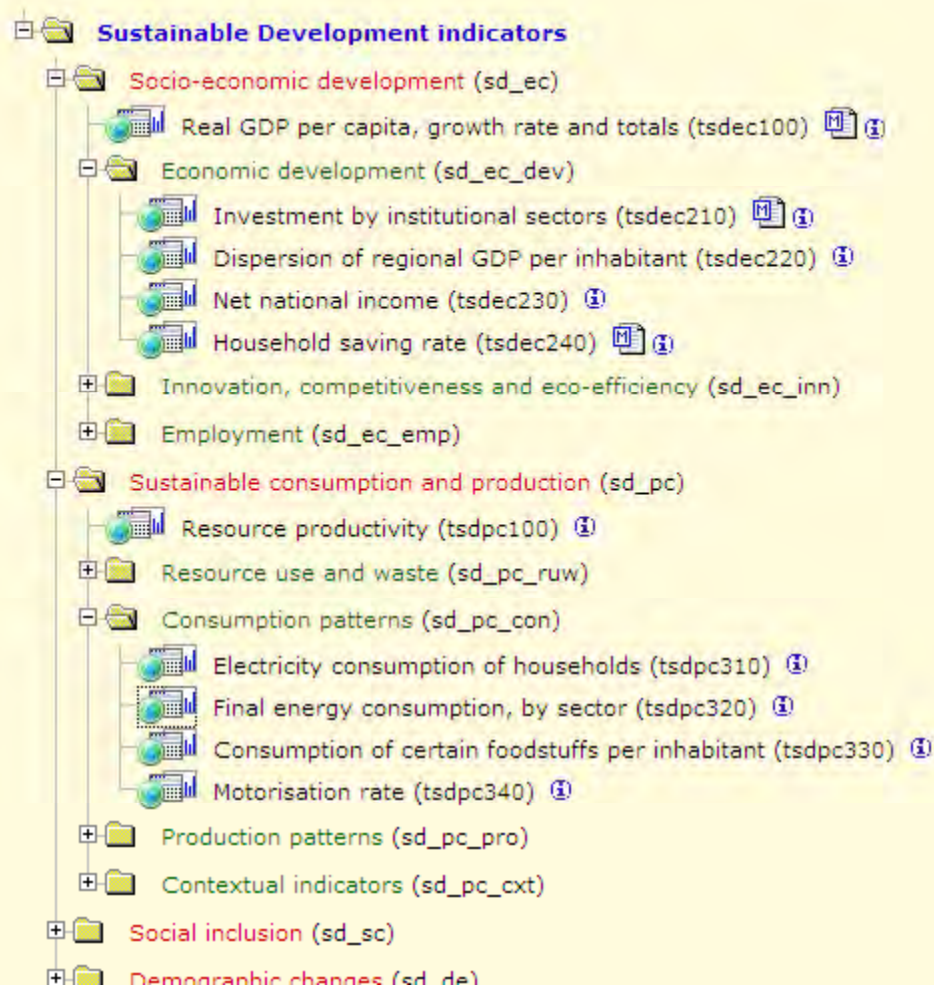
Publications

Rio + 20

Videos

Links

Complete set of indicators





Final energy consumption, by sector

100 tonnes of oil equivalent

Final Energy Consumption - Transport

This indicator expresses the sum of the energy supplied to the final consumer's door for ... [more](#)

Final Energy Consumption - Transport







Country	time	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
EU (27 countries)		39806	341381	344700	347552	352707	363005	366715	374414	379758	379758
European Union (changing composition)		:	:	:	:	:	:	:	:	:	:
Belgium		9633	9661	9544	9645	10177	10247	9927	9615	9500	9500
Bulgaria		2031	1993	2069	2171	2382	2564	2856	3062	2959	2959
Czech Republic		4317	4405	4654	4861	5501	5783	6191	6330	6682	6682
Denmark		4818	4821	4846	4796	4975	5203	5327	5390	5610	5610
Germany		6971	65936	64451	63769	61786	63251	62373	63697	61772	61772
Estonia		581	578	678	718	691	711	765	802	862	862
Ireland		3690	4018	4288	4398	4440	4614	4997	5371	5747	5747
Greece		7469	7212	7380	7478	7819	7978	8087	8458	8728	8728

Thank You

GEO₅



RESOURCES

-  [GEO-5 Assessment Full Report: \[English\], \[中文\]](#)
-  [GEO-5 Assessment Report by Chapter: \[Table of Contents\]](#)
[\[Front Matter\]](#), [\[1\]](#), [\[2\]](#), [\[3\]](#), [\[4\]](#), [\[5\]](#), [\[6\]](#), [\[7\]](#), [\[8\]](#), [\[9\]](#), [\[10\]](#), [\[11\]](#), [\[12\]](#), [\[13\]](#),
[\[14\]](#), [\[15\]](#), [\[16\]](#), [\[17\]](#), [\[End Matter\]](#)
-  [GEO-5 Video: \[En\], \[Fr\], \[Sp\], \[Ch\], \[Ru\], \[Ar\], \[Pt\]](#) [Download \[En\]](#)
-  [Regional Summaries: Africa, Asia & the Pacific,](#)
[Europe, Latin America & the Caribbean, North America, West Asia](#)
-  [Press Release \[En\], \[Fr\], \[Sp\], \[Ch\], \[Ru\], \[Ar\], \[Pt\]](#)
-  [Technical Briefs: \[Land\] \[Water\]](#)



GEO-5 Launch sites: Rio de Janeiro, Panama City, Lima, Washington, New York, London, Brussels, Geneva, New Delhi, Nairobi, Addis Ababa, Bahrain, Beijing

GEO-5 SPECIALIZED PRODUCTS



GEO-5 FOR LOCAL GOVERNMENT

[English]

Press Release:
[English] [Français]

【中文】



MEASURING PROGRESS

[English]



GEO-5 SPM
[En] - [Fr] - [Es]
[Pt] - [Ru] -
[Ch]
[Ar]

E-Book



KEEPING TRACK

[English - Español]

[Press Release -

GEAS Article 1