The Global Agenda: International vulnerability assessments and the Millennium Ecosystem Assessment

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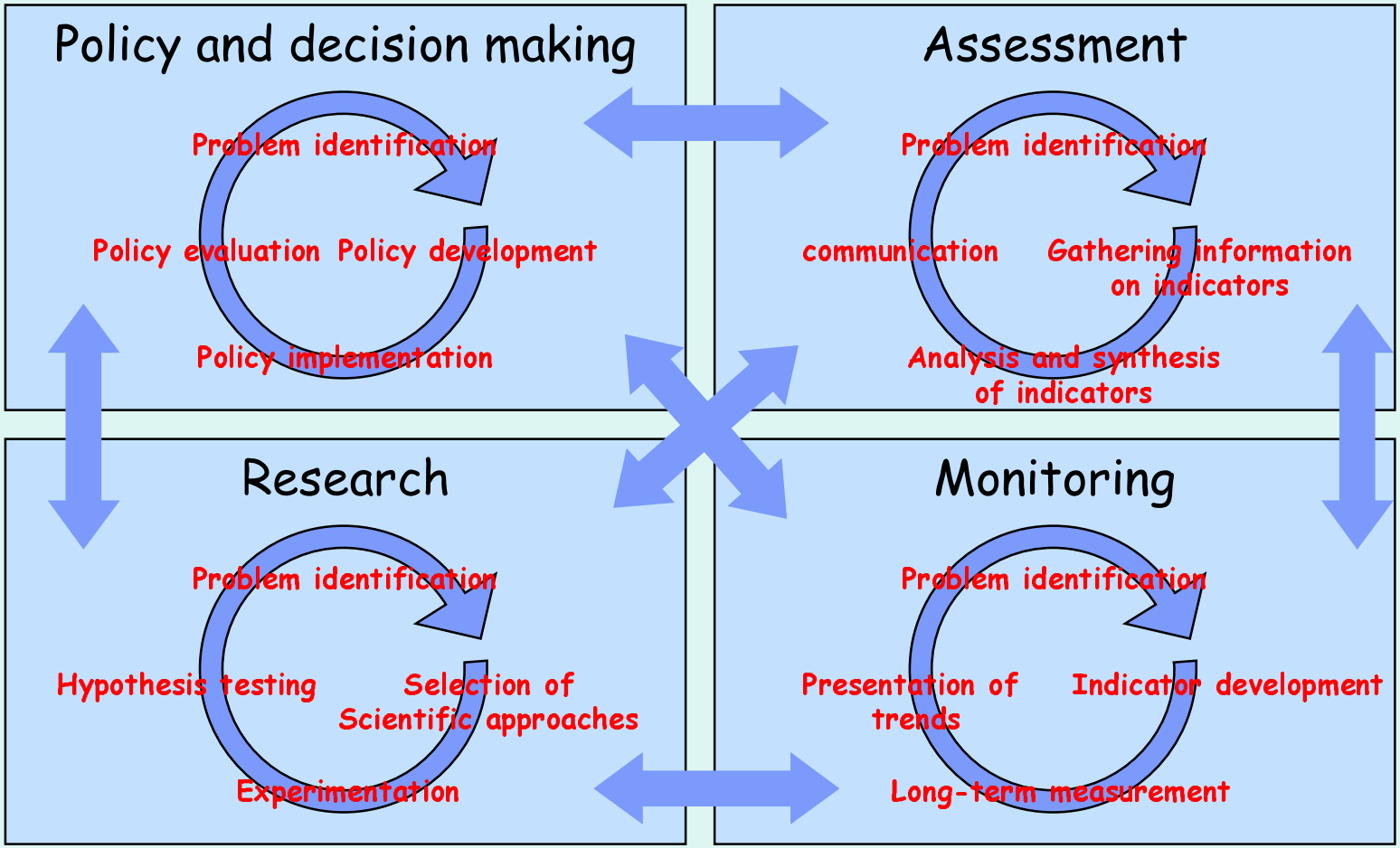
Outline of the talk

- Purpose of scientific vulnerability assessments
- Some important global environmental vulnerability assessments up to date
- The Millennium Ecosystem Assessment (MA)
- The MA Scenarios

Interactions between the policy and the science community



Why do scientific assessments?

- To bridge the gap between policy/decision-makers and the scientific community
- To synthesize scientific information and communicate it in a way that is understandable for a non-scientific audience
- To alert decision-makers of emerging developments and/or decisions and their consequences

Criteria for scientific assessments

- Credible
  - information is scientifically sound and technically correct
- Salient
  - information is relevant for decision makers
- Legitimate
  - assessment process meets standards of procedural and political fairness

Questions faced by decision-makers

Food

Food production must increase to meet the needs of an additional 3 billion people over the next 30 years

Water

One-third of the world's population is now subject to water scarcity.

Population facing water scarcity will double over the next 30 years

Timber

Wood fuel is the only source of fuel for one third of the world's population.

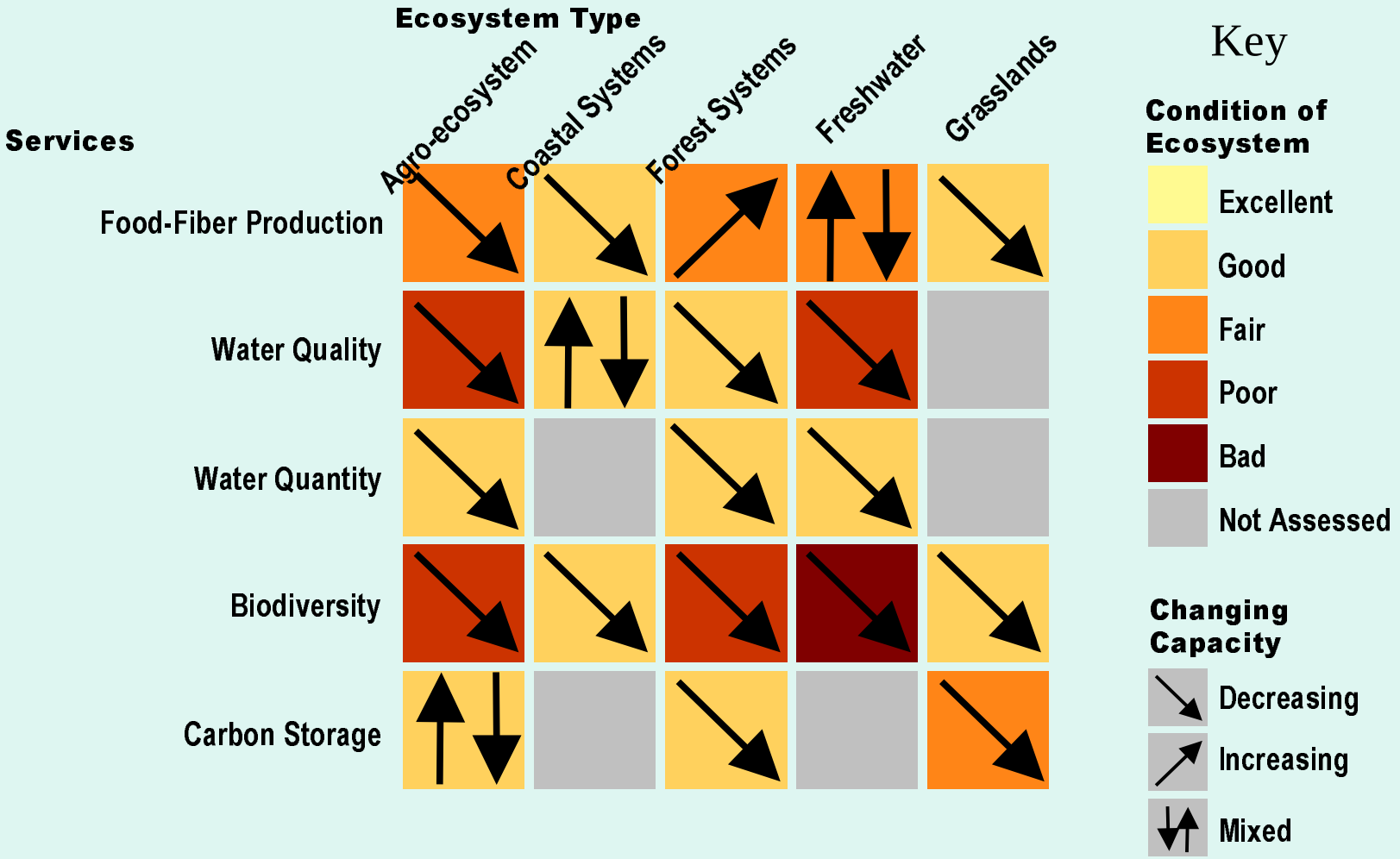
Wood demand will double in next 50 years.

Goals defined by the world community

- Millennium Development Goals
- Goals of the UN conventions:
  - Biodiversity
  - Wetlands
  - Climate change
  - Desertification
  - Migratory species

⇨ Sustainable development – but how???

ISSUE: *A recent study* shows that the capacity of many ecosystems to provide certain services has been declining…*



*Source: Pilot Assessment of Global Ecosystems. 2000. WRI, IFPRI

Environmental Vulnerability Assessments at the global level

- IPCC (intergov. panel)
- Global Environmental Outlook (UNEP)
- Global Biodiversity Assessment (WRI and UNEP)
- Global Mountain Biodiversity Assessment (Diversitas GCTE, ICSU)
- World Water Vision
- Global Freshwater Assessment (WCMC-UNEP)
- Millennium Ecosystem Assessment

The Millennium Ecosystem Assessment (MA)

Goal:

Create a mechanism to increase the amount, quality, and credibility of policy-relevant scientific research findings concerning ecosystems & human well-being

A 4-year international scientific assessment (June 2001 – March 2005)

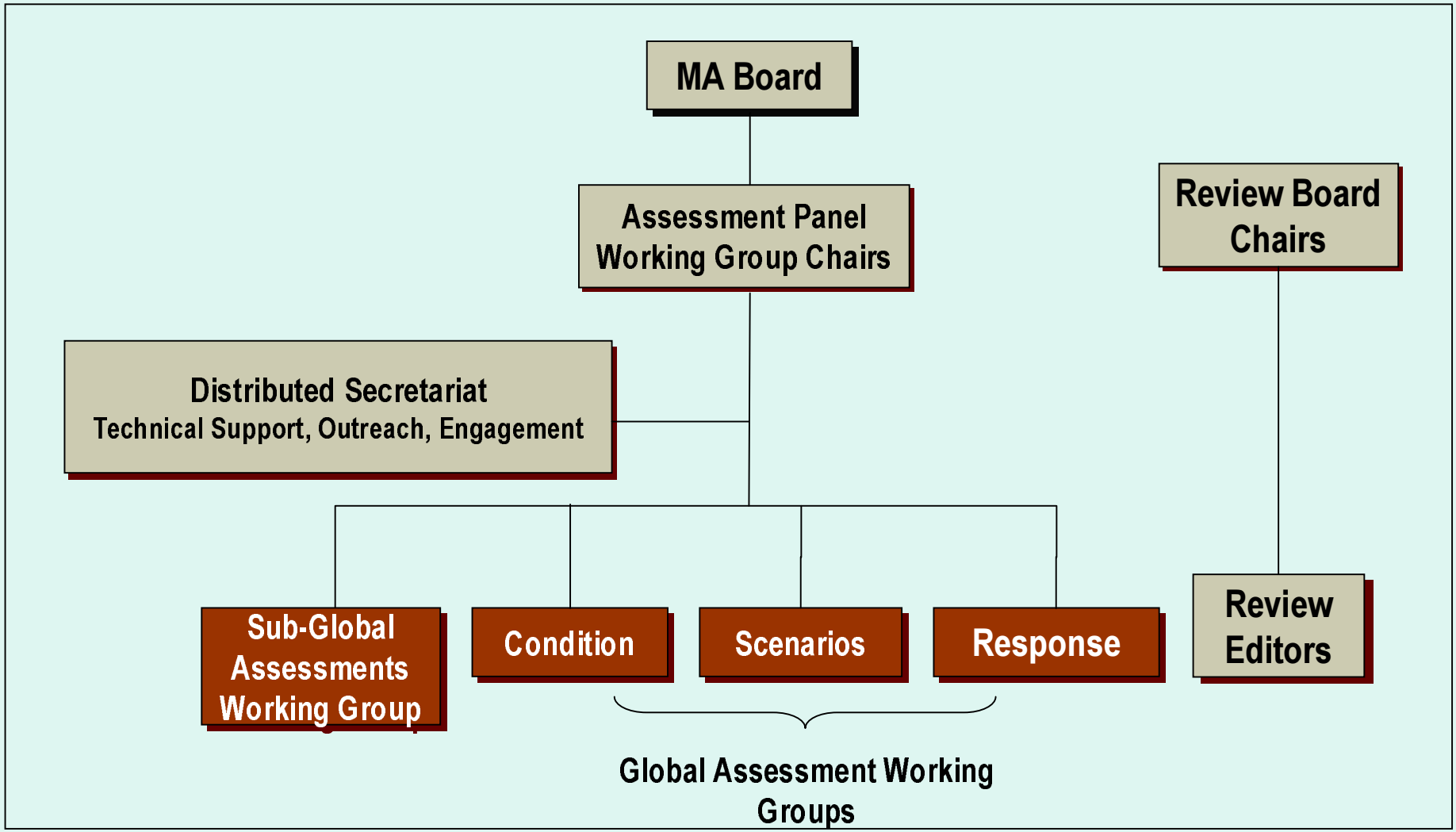
- Designed to meet a portion of the assessment needs of the CBD, CCD, Ramsar Wetlands Convention, the private sector, NGO networks and other partners
- Focused on ecosystem services, the consequences of changes in ecosystems on human well being, and consequences on other life on earth
- Undertaken at multiple scales (local to global)

The authorizing environment of the MA

- Convention on Biological Diversity
- Convention to Combat Desertification
- Ramsar Wetlands Convention

- International organizations
- Private sector
  - Individual companies
  - WBCSD
  - "intermediaries"
  - trade organizations
- National & sub-national government ministries
- Local communities & civil society
- Media

Organizational Set-up of the MA



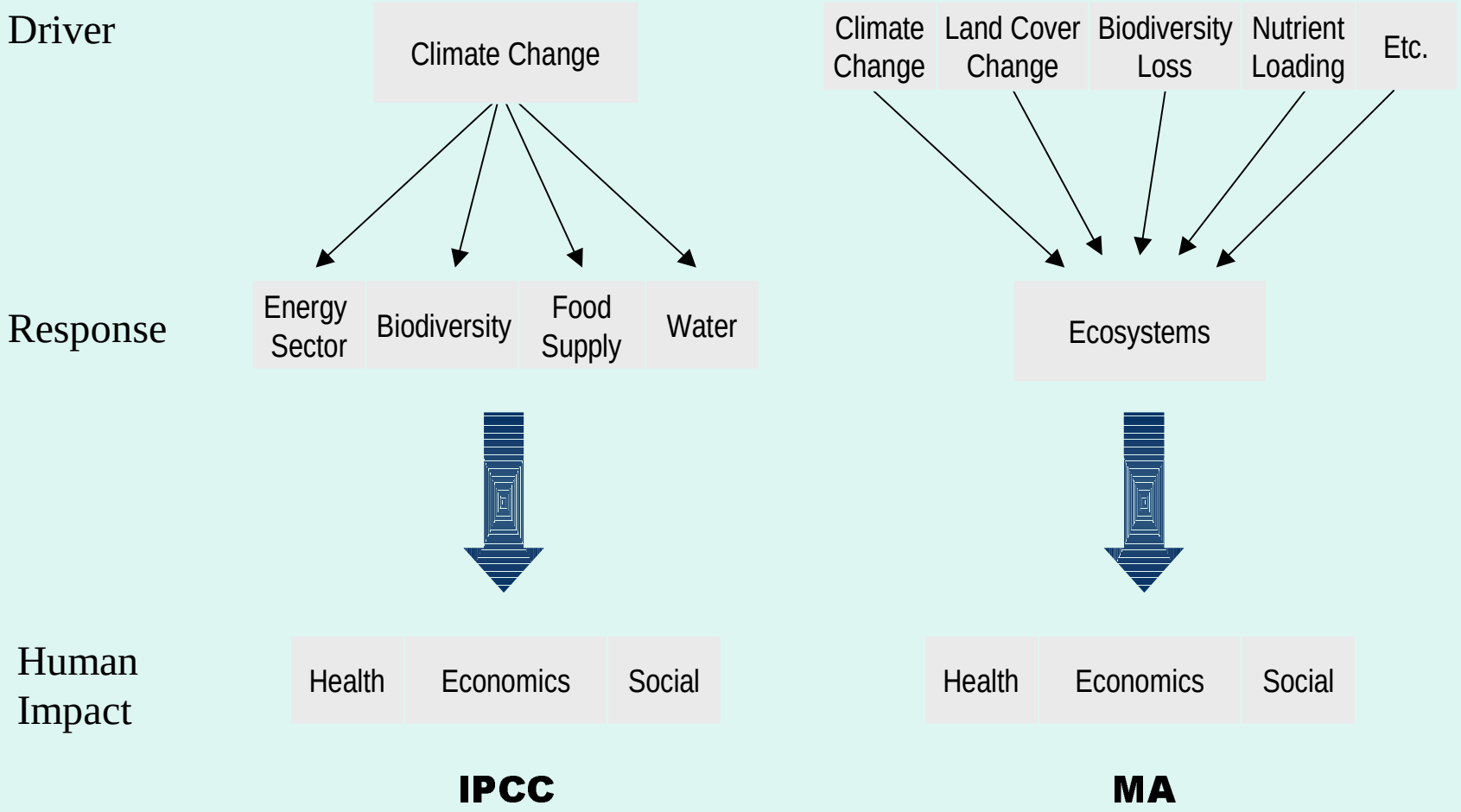
Tasks of the different MA components

- MA Board: represent the users of the generated information and governs the assessment
- MA Panel: provides scientific leadership, co-chairs of all four working groups + a few others
- Working Groups: carry out the assessment, 500 scientists from 80 countries
- Secretariat: provides conceptual and logistical support to the WGs
- Review Editors: assure scientific credibility

MA receives financial and in-kind contributions from a variety of sources

FINANCIAL CONTRIBUTIONS (~ $17 MILLION)	IN-KIND CONTRIBUTIONS (~ $6 MILLION)
Sponsors • Global Environment Facility • United Nations Foundation • Packard Foundation • World Bank • United Nations Environment Program **Other Donors** • Government of Norway • Kingdom of Saudi Arabia • Rockefeller Foundation • NASA • ICSU • Swedish International Biodiversity Programme • Christensen Fund	• Norway • China • India • Japan • Germany • Netherlands • United States (NASA, USGS, ORNL, USDA) • European Commission • FAO, UNDP, WHO, UNESCO, UNEP • ICRAF, ICLARM • Numerous other countries, NGOs, Universities and other institutions are supporting travel costs of experts

The MA is an integrated assessment

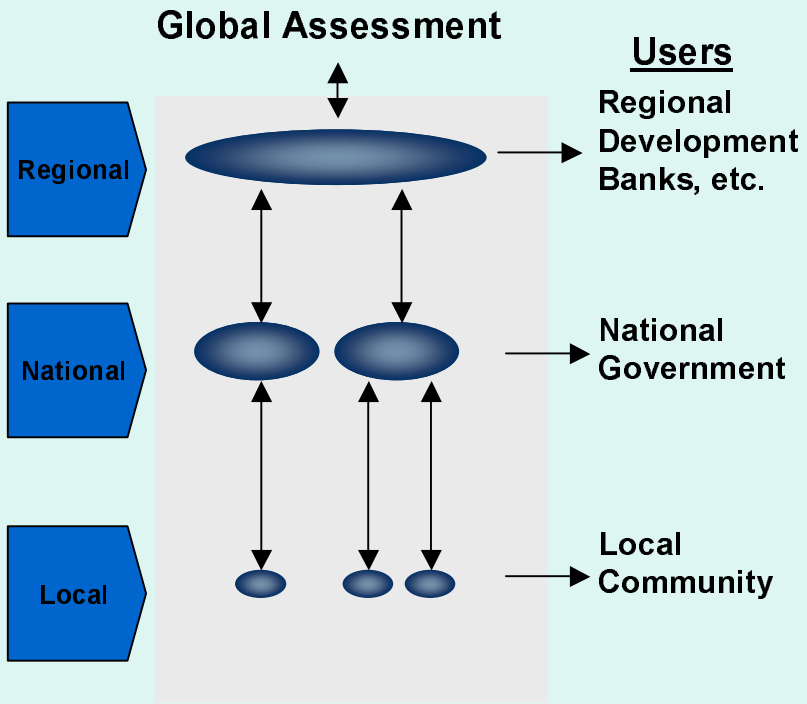


Multiple Scales

The MA is a multi-scale assessment - it is expected that findings at any scale of a multi-scale assessment will differ from those of a single-scale assessment as a result of information and perspectives from other scales

Why undertake a multi-scale assessment?

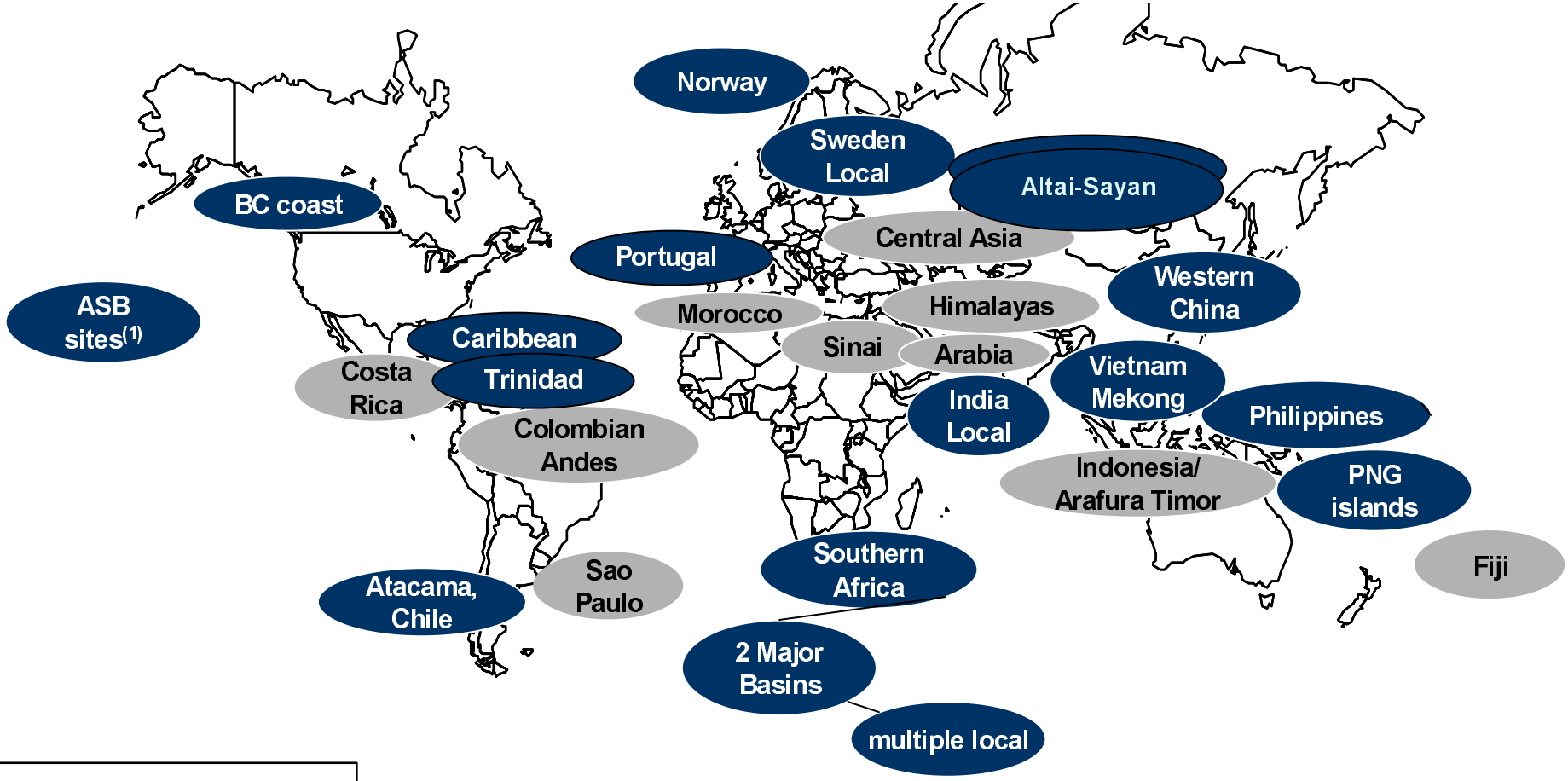
- **Permit social and ecological processes to be assessed at their characteristic scale**
- **Allow greater spatial, temporal, causal detail to be considered as scale becomes finer**
- **Allow independent validation of larger-scale conclusions**
- **Permit reporting and response options matched to the scale where decision-making takes place**



THE FAMILY OF MA SUB-GLOBAL ASSESSMENTS GROWS

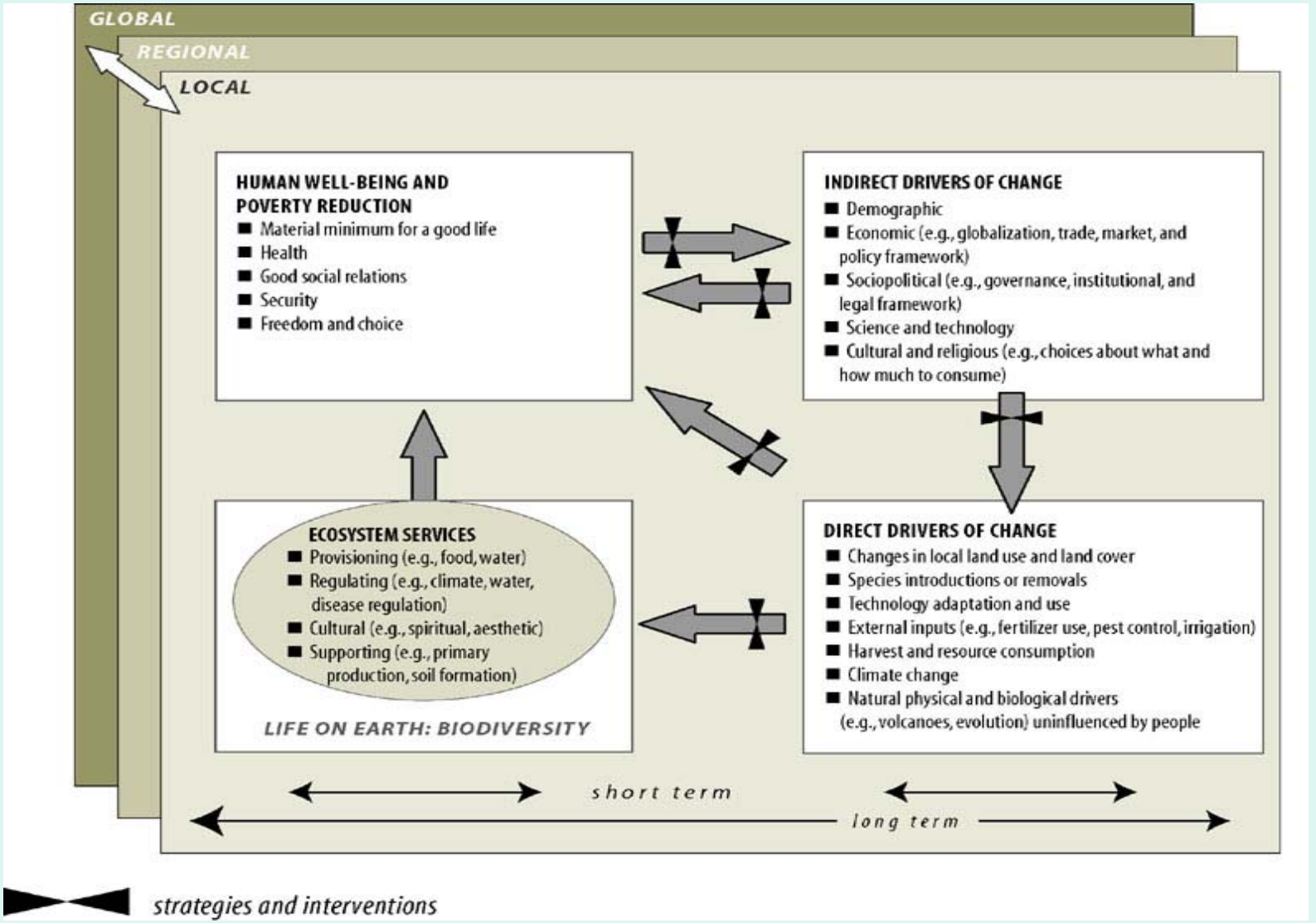
Eleven Approved, Numerous Associates – August 2003

15 Approved, Numerous Associates – September 2003



(1) ASB: Alternatives to Slash and Burn – multiple local sites worldwide

The conceptual framework of the MA



Ecosystem Services = Benefits people obtain from ecosystems

Provisioning

Goods produced or provided by ecosystems

- food
- fresh water
- fuel wood
- fiber
- biochemicals
- genetic resources

Regulating

Benefits obtained from regulation of ecosystem processes

- climate regulation
- disease regulation
- flood regulation
- detoxification

Cultural

Non-material benefits obtained from ecosystems

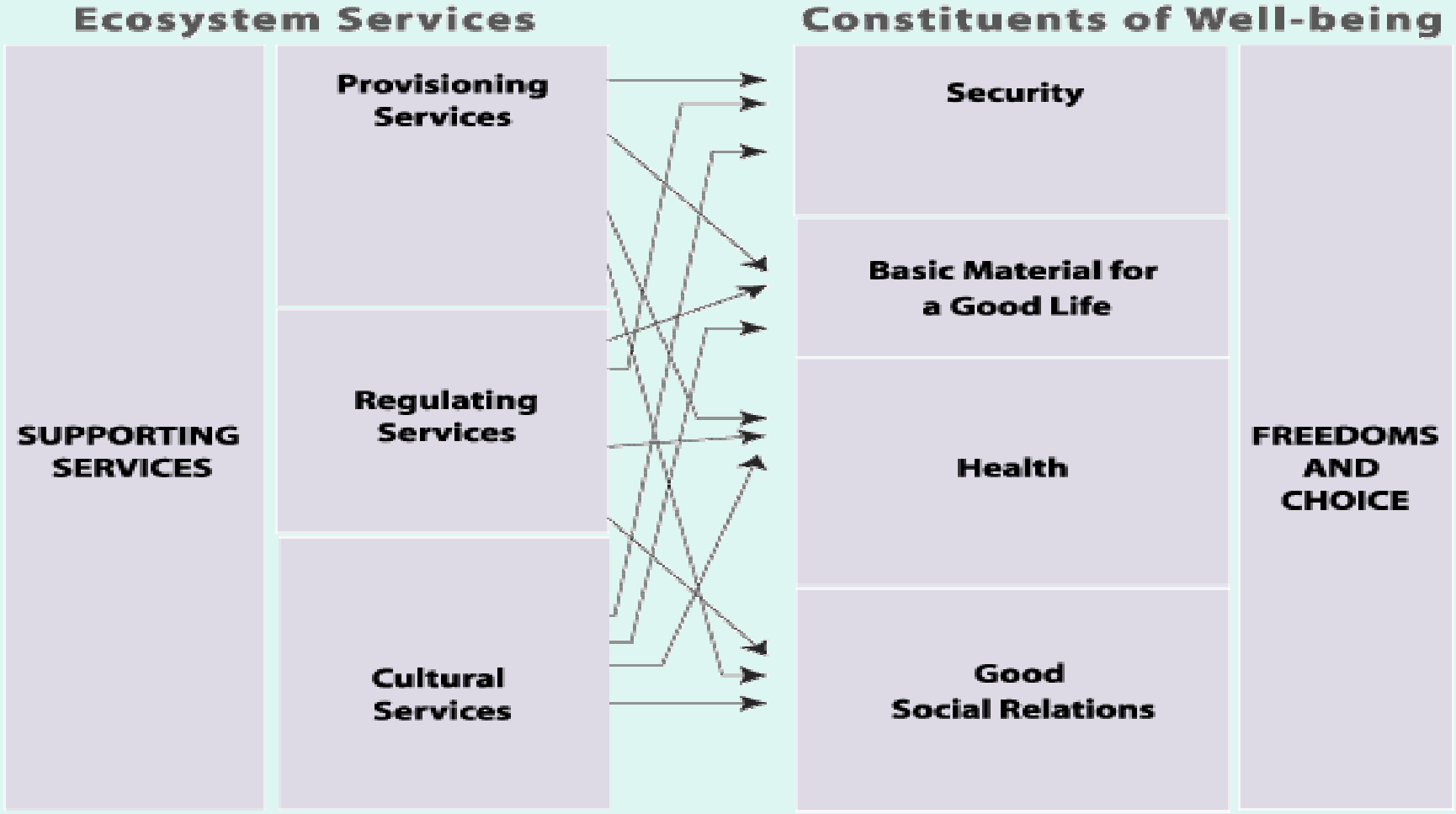
- spiritual
- recreational
- aesthetic
- inspirational
- educational
- communal
- symbolic

Supporting

Services necessary for production of other ecosystem services

- Soil formation
- Nutrient cycling
- Primary production

Interactions between ES services and Human Well-being



Using the Conceptual Framework as a guide, MA Working Groups will try to answer core questions

Conditions and Trends Working Group

- What is the current condition and historical trends of ecosystems and their services?
- What have been the consequences of changes in ecosystems for human well-being?

Scenarios Working Group

- Given plausible changes in primary drivers, what will be the consequences for ecosystems, their services, and human well-being?

Responses Working Group

- What can we do about it?

Sub-Global Assessment Working Group

All of the above… at sub-global scales

Scenarios as a way to illustrate choices

Describe the range of possible outcomes for ecosystem condition, ecosystem services, and human well-being

Describe the connections between human actions and the future of ecosystems and their services

Illustrate the connections between people and nature in evocative ways that communicate the general patterns which emerge from the MA technical reports.

Scenarios are stories about the future with a logical plot and narrative governing the manner in which events unfold

TIME

Scenarios can also …

- Organize information
- Evaluate choices
- Confront uncertainty
- Aid outreach and education

The focal questions of the global scenarios (latest version)

- What are the consequences of plausible changes in development paths for ecosystems and their services over the next 50 years and what will be the consequences of those changes for human well-being?
- What are the consequences for ecosystem services (ES) and human well-being (HWB) of strategies that emphasize economic policy reform as the primary means of environmental management?
- What are the consequences for ES and HWB of strategies where individual countries and regions given primary emphasis to their local and regional environment and far less emphasis to cross-border and global environmental issues?
- What are the consequences for ES and HWB of strategies that emphasize the development and use of technologies allowing greater eco-efficiency and adaptive control?
- What are the consequences for ES and HWB of strategies emphasizing adaptive management or local learning?

Four forward-looking scenarios

Global Orchestration

TechnoGarden

Order from Strength

Adapting Mosaic

Global Orchestration

Successes of policy and markets of the last century lead to optimism about improving functioning of socio-economic systems and the hope that this will lead to improvements in provision of ecosystem services.

Global "one size fits all" style management and focus on market-based solutions.

Ecological feedbacks are generally dealt with by improved technological capabilities and responsive policies.

Potential Benefits	**Potential Risks**
• Decreasing economic inequality (Kuznets' greening) • Economic Prosperity (b/c growing other economies means that there are people to buy rich world products)	• Ecological crises accelerate inequality (b/c it disproportionately affects the poor • Reactive mgmt proves to be more costly • Loss of economic growth due to fragmentation • Inability to benefit from trade

TechnoGarden

Ecosystem services and learning are very important (but protected ecosystems not the best way to provide services).

Technological successes lead to increased substituting technology for regulatory services to improve the supply of ES to people.

General focus on global "one size fits all" style management.

Potential Benefits	Potential Risks
•Highly effective utilization of ecosystem services •Enhancing ecosystem services	•Technological failures have far-reaching effects with big impacts •Wilderness eliminated as "gardening" of nature increases •The gap between people and nature increases •Less economic growth than the max possible because of diversion of resources to management

Order from strength

Security is very important. Control of socio-ecological linkages is strongly in the hands of the rich and powerful nations and powerful individuals in poor nations.

Ecological problems can and should be handled by increasing benefits locally, even if it means exporting some problems to other, less powerful areas.

Trade should flow openly and without barriers except those put in place by elites.

Potential Benefits	Potential Risks
•Increased security •Less expansion of invasive species •Islands of quality ecosystems	•High inequality/social tension •Risk of security breaches •Global environmental degradation •Lower economic growth •Malnutrition

Adapting Mosaic

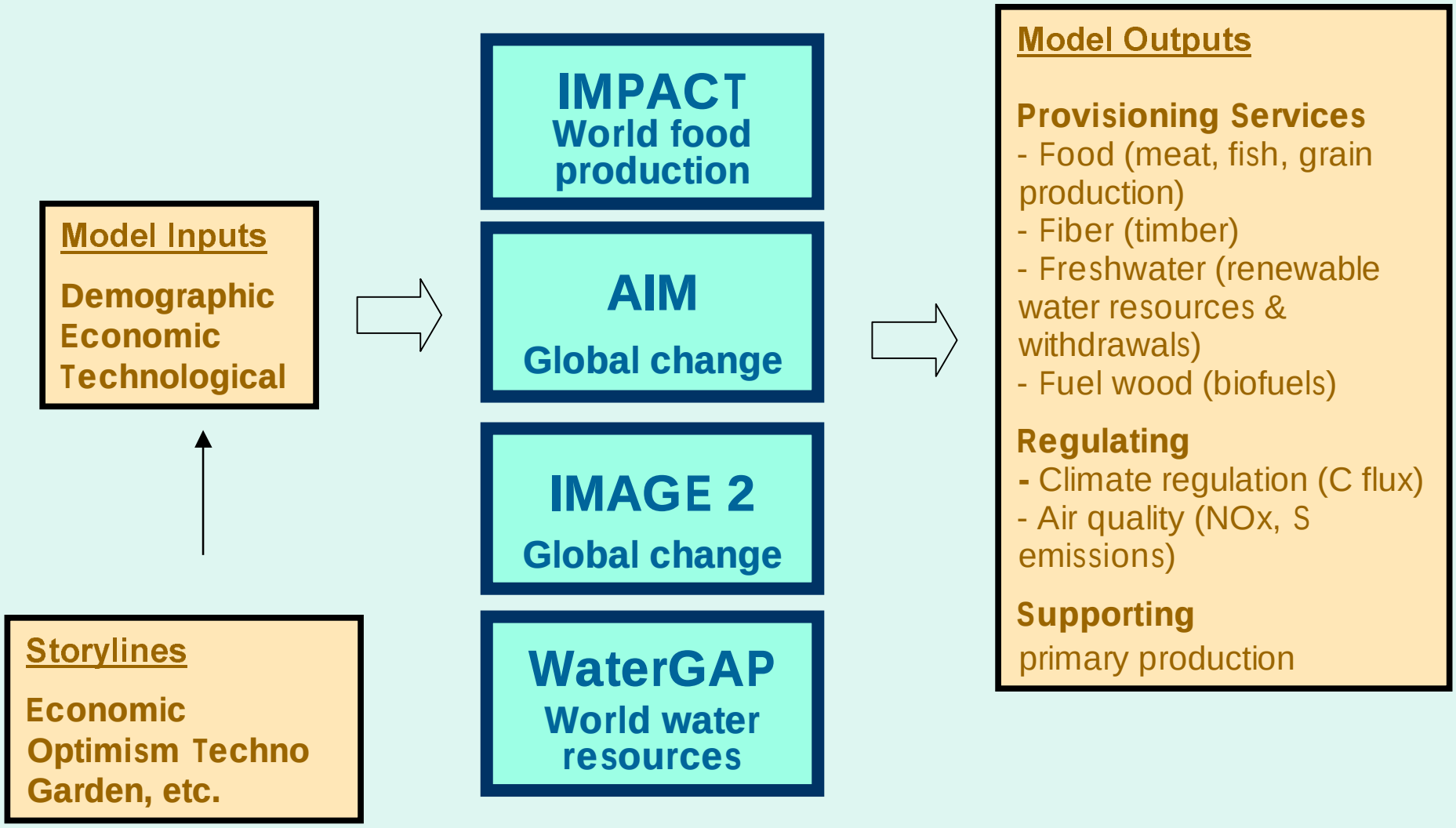
Ecosystem services are important and functioning ecosystems are an important part of providing ecosystem services.

Focus on natural capital is enough to maintain adequate provision of ecosystem services. This changes later in the scenario and there is increased focus on human and social capital.

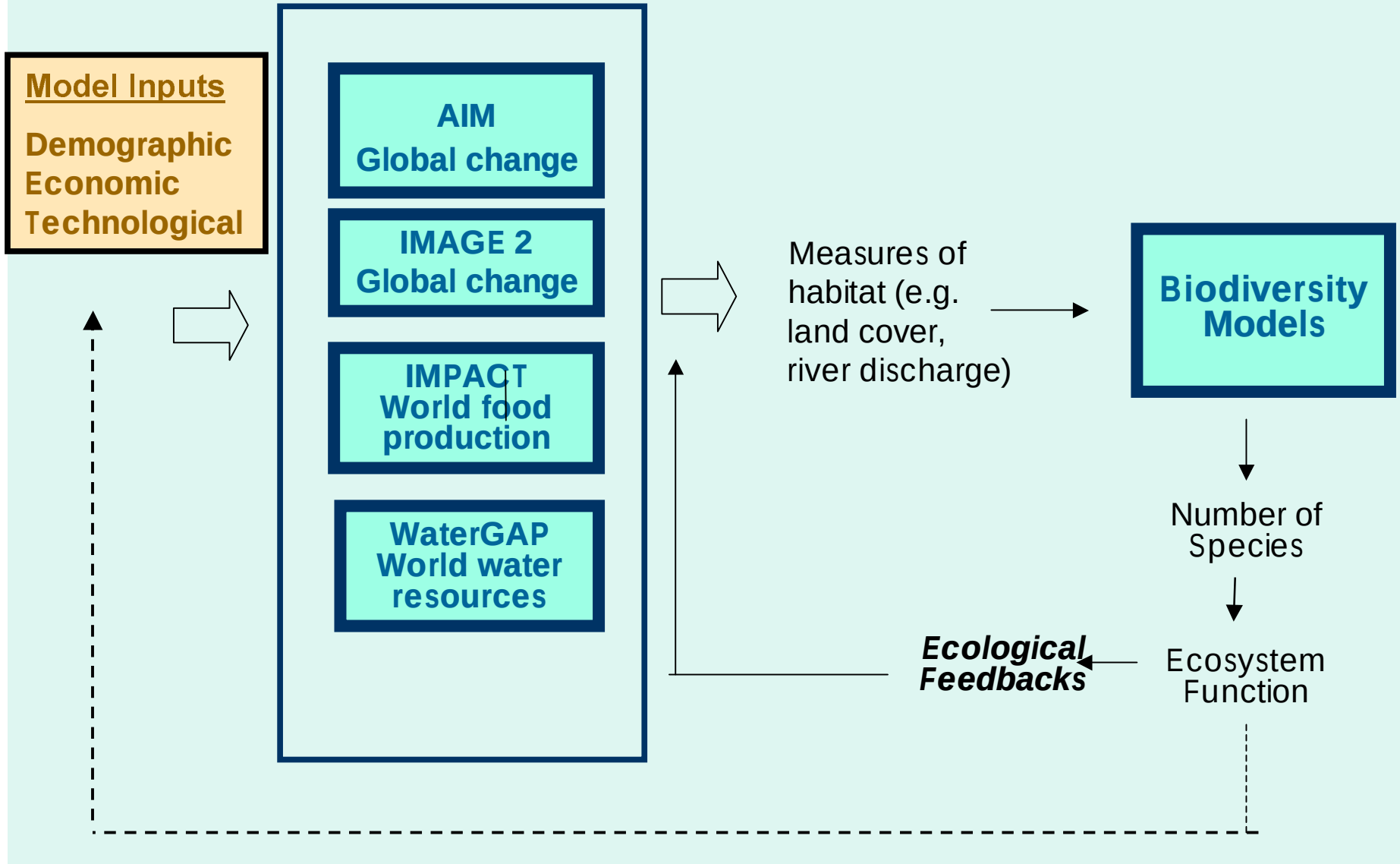
A mix of management successes and failures has led people to be optimistic about learning, but humble about preparing for surprises and understanding all there is to know about how ecosystems work.

Potential Benefits	**Potential Risks**
•High coping capacity with local changes (proactive) •Win-win management of ecosystem services	•Neglect of global commons •Inattention to inequality •Less economic growth than the max possible b/c diversion of resources to management and b/c less trading

Modeling to quantify parts of the MA scenarios

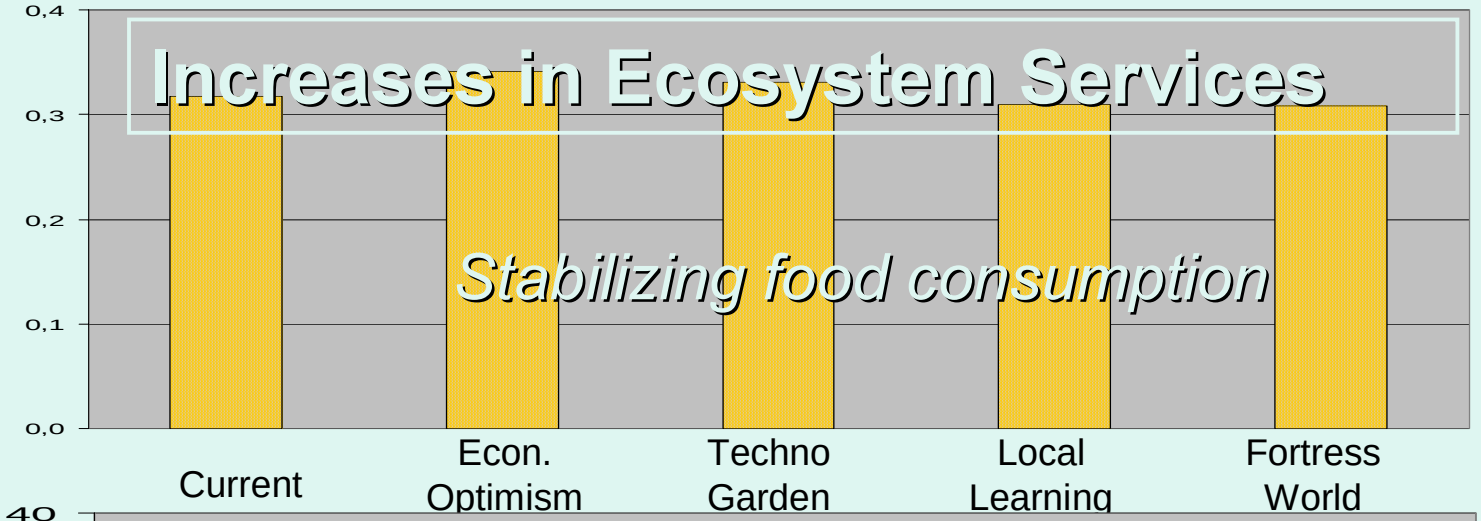


…and to make it more complicated: Ecological Feedbacks



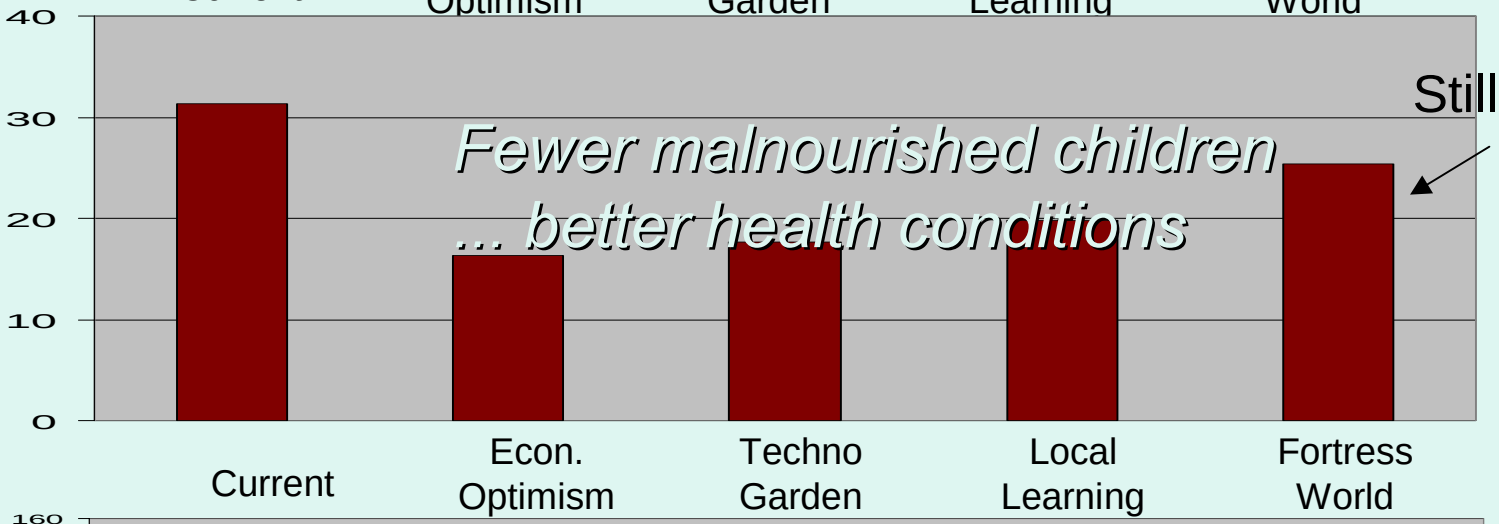
Increases in Ecosystem Services

World (2050)



Stabilizing food consumption

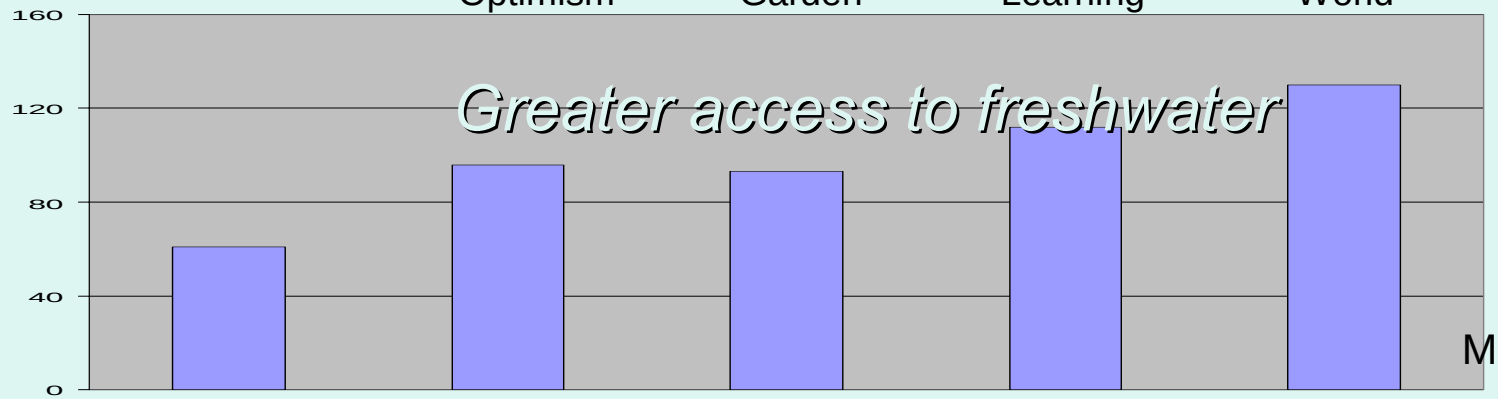
Grain Consumption per capita [t/cap* a]



Fewer malnourished children … better health conditions

Still high

Malnourished Children [%]



Greater access to freshwater

Domestic water use [m^3/cap*a]

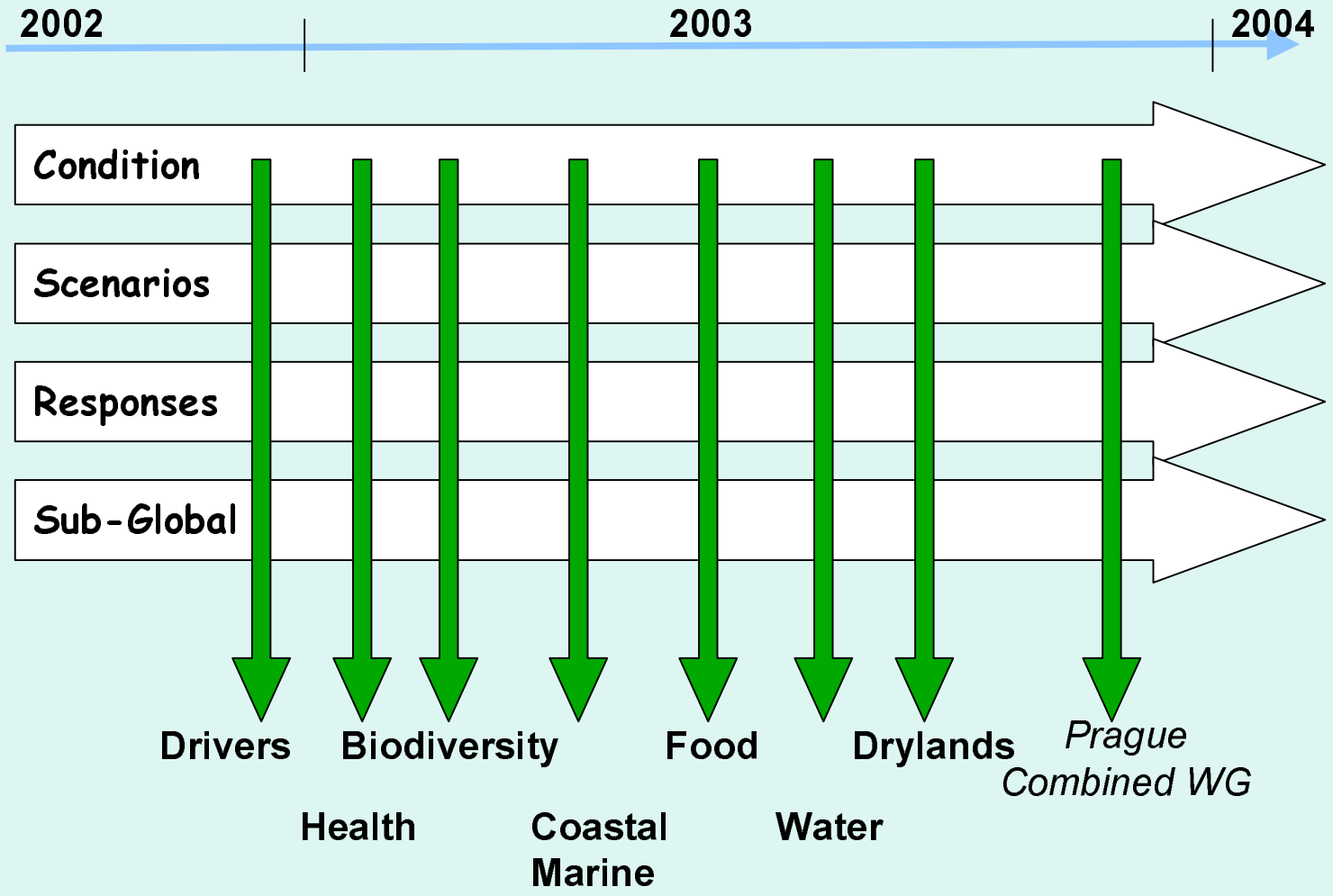
Maln, H20, fem enroll

♦

MA Cross-cutting Issues

Seven issues were identified that cut across all working groups.

Special meetings have been held to address these "cross-cutting" issues.



What are the Outputs of the Global Assessment?

2003

- **People and Ecosystems: A Framework for Assessment**
  - Release: September
- **MA Data Catalog**
  - Datasets being used in the MA

2004

- **Conference Proceedings: Bridging Scales and Epistemologies in Multi-scale Assessments**

2005

- **Technical Assessment Reports (300-800 pages ea.) and Summaries for Decision-makers (SDMs)**
  - Sub-global Assessment
  - Condition/Trends Assessment
  - Scenario Assessment
  - Response Options Assessment
  - Summary Volume (SDMs of 4 reports)

Assessment Outputs: Global (continued)

2005

- **Synthesis Reports (30-50 page)**
  - Ecosystems and Human Well-being
  - Biodiversity (CBD)
  - Desertification (CCD)
  - Wetlands (Ramsar)
  - Private Sector
  - Health and Ecosystems (tentative)
  - Food and Cultivated Systems (tentative)
- **Board Summary of Key Messages (10 p.)**
- **Other Products**
  - Reports available over internet (multiple language for summary docs)
  - Interactive web-based MA indicator exploration capability
  - Partnerships for expanded outreach: radio, theatre, documentaries, film (*tentative)*
  - Partnerships for capacity-building/training outreach (*tentative)*

Credibility, Saliency, Legitimacy and the MA

- **Credible**
  - Peer and government review process
- **Salient**
  - User needs document
  - Board composition
  - User fora
- **Legitimate**
  - Geographic and gender balance
  - Open and transparent process

… but, as we already know:
the ultimate answer is

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