

Findings from the Millennium Ecosystem Assessment

Prepared for the
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Conventions and Action Plans

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The Millennium Ecosystem Assessment was:

Assessment was:



– An international scientific assessment to be completed in 2005. Conducted by 1000+ scientists from 100 countries.

– Designed to meet a portion of the assessment needs of international conventions, private sector, civil society and others

– Undertaken at multiple scales (local to global)

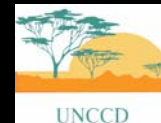
– Designed to both provide information and build capacity to provide information

– Expected to be repeated at 5-10 year intervals if it successfully meets needs

UNITED NATIONS
FOUNDATION

IUCN
The World Conservation Union

undp



Main Goals of the MA

Create a Mechanism

– to increase the amount, quality, and credibility of policy-relevant scientific research findings. . .

concerning ecosystems & human well-being. . .

...for use by decision makers



Basic Types of Questions Addressed

- **What will be the consequence of a further 30% increase in fixed nitrogen for ecosystems and human well-being?**
- **What policies and actions concerning ecosystems can best contribute to economic development and the reduction of poverty?**
- **What is the impact of economic growth and globalization on ecosystems?**
- **What is the impact of ecosystem change on human health?**

Main components of the MA approach

- **Ecosystem Services**

The benefits people obtain from ecosystems

- **Human well-being**

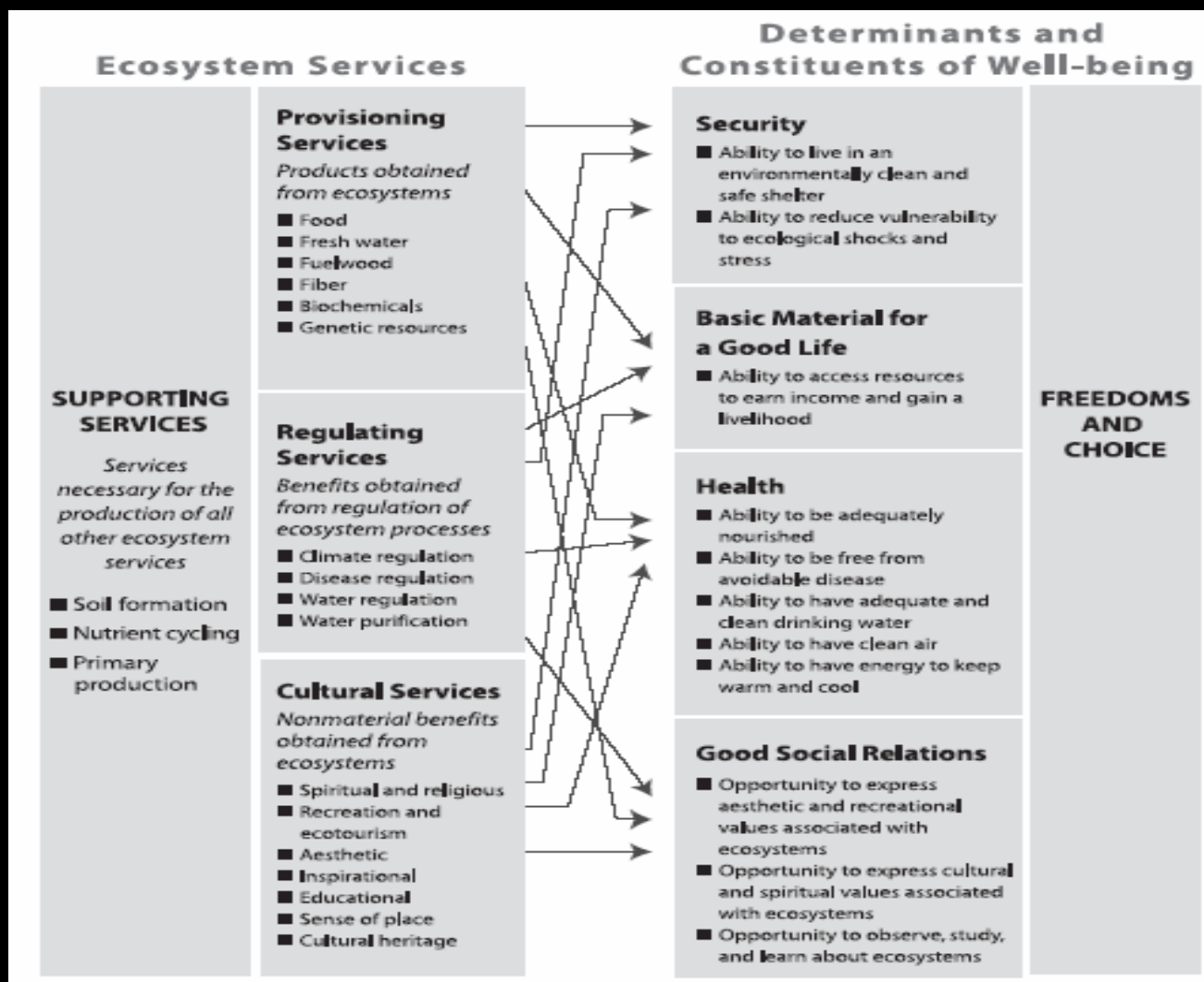
Multi-dimensional and context specific



Main components of the MA approach

<p>Provisioning</p> <p>Goods produced or provided by ecosystems</p> <ul style="list-style-type: none">• food• fresh water• fuel wood• genetic resources	<p>Regulating</p> <p>Benefits obtained from regulation of ecosystem processes</p> <ul style="list-style-type: none">• climate regulation• disease regulation• flood regulation	<p>Cultural</p> <p>Non-material benefits from ecosystems</p> <ul style="list-style-type: none">• spiritual• recreational• aesthetic• inspirational
<p>Supporting</p> <p>Services necessary for production of other ecosystem services</p> <ul style="list-style-type: none">• Soil formation• Nutrient cycling• Primary production		

Links across ES and HWB



Finding #1

- Over the past 50 years, humans have changed ecosystems more rapidly and extensively than in any comparable period of time in human history
- Approximately 60% of the ecosystem services assessed are in decline

Status of Provisioning Services

	Service	Status
Food	crops	↑
	livestock	↑
	capture fisheries	↓
	aquaculture	↑
	wild foods	↓
	Fiber	timber
cotton, silk		+/-
wood fuel		↓
Genetic resources		↓
Biochemicals, medicines		↓
Fresh water		↓

Status of Regulating and Cultural Services

	Status
Regulating Services	
Air quality regulation	↓
Climate regulation – global	↑
Climate regulation – regional and local	↓
Water regulation	+/-
Erosion regulation	↓
Water purification and waste treatment	↓
Disease regulation	+/-
Pest regulation	↓
Pollination	↓
Natural hazard regulation	↓
Cultural Services	
Spiritual and religious values	↓
Aesthetic values	↓
Recreation and ecotourism	+/-

Why Decline in Ecosystem Services

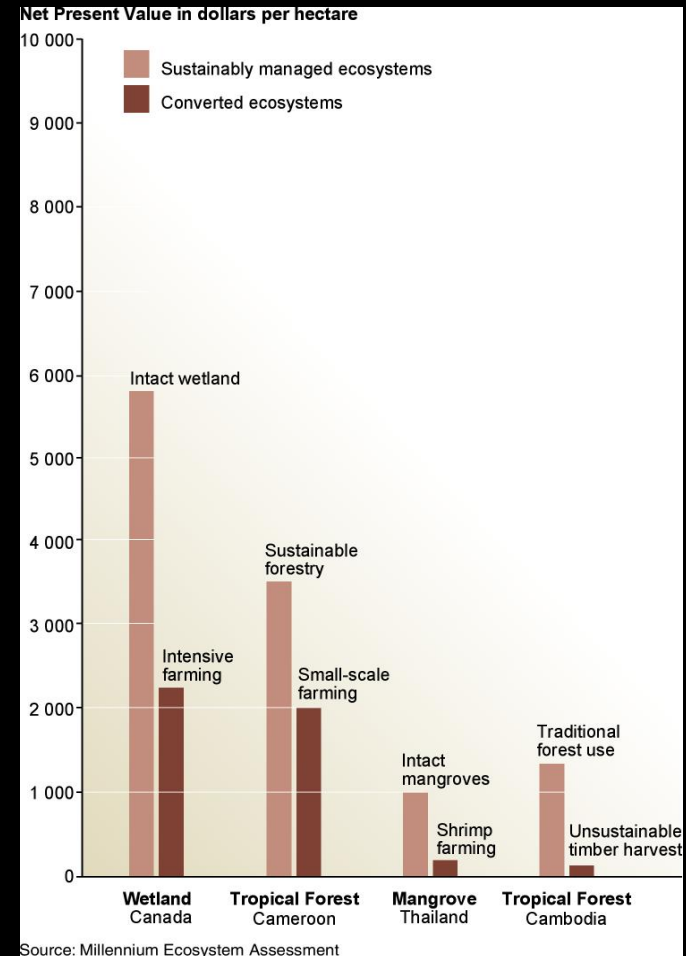
One of the primary reasons ecosystem services are in decline is because their full values are not known and if known are not taken into consideration in decision making. (MA 2005)





Decline in ecosystem services often is caused by lack of Total Economic Value

- The total economic value associated with managing ecosystems more sustainably is often higher than the value associated with conversion
- Conversion may still occur because private economic benefits are often greater for the converted system



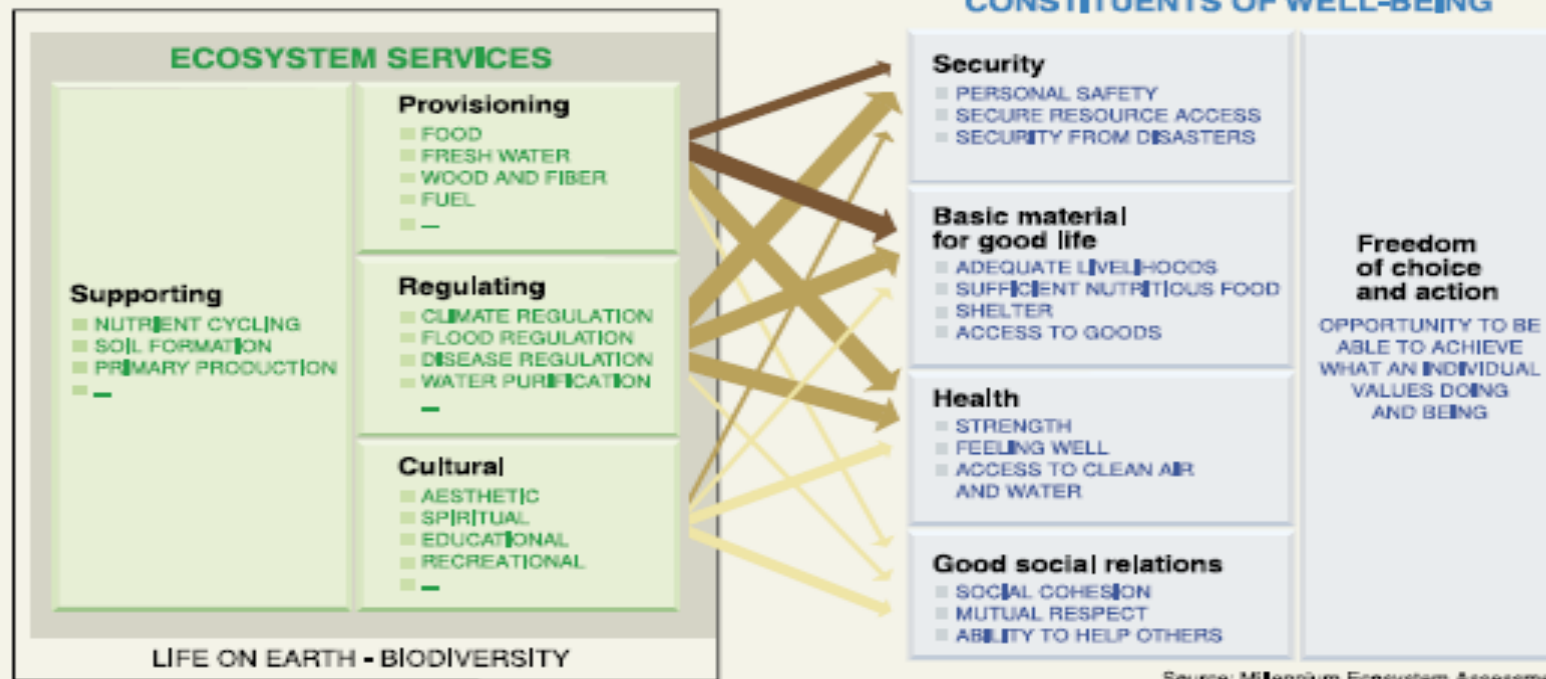


Finding #2

- The changes that have been made to ecosystems have contributed to substantial net gains in human well-being and economic development
 - Since 1960, while population doubled and economic activity increased 6-fold, food production increased 2 ½ times, food price has declined, water use doubled, wood harvest for pulp tripled, hydropower doubled.
- But these gains have been achieved at growing costs that, unless addressed, will substantially diminish the benefits that future generations obtain from ecosystems

Ecosystem services and human well-being

LINKAGES BETWEEN ECOSYSTEM SERVICES AND HUMAN WELL-BEING



Source: Millennium Ecosystem Assessment

ARROW'S COLOR
Potential for mediation by socioeconomic factors

- Low
- Medium
- High

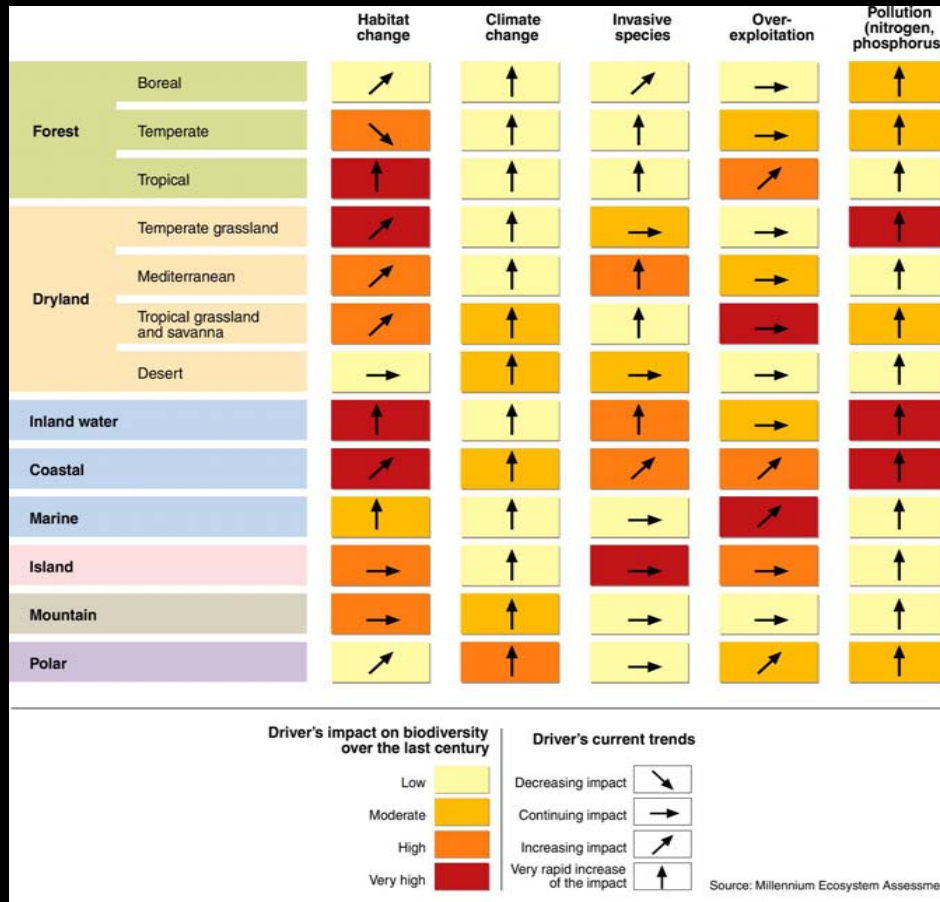
ARROW'S WIDTH
Intensity of linkages between ecosystem services and human well-being

- Weak
- Medium
- Strong

Finding #3:

- The degradation of ecosystem services could grow significantly worse during the first half of this century and is a barrier to achieving the Millennium Development Goals

Direct drivers growing in intensity



- Most direct drivers of degradation in ecosystem services remain constant or are growing in intensity in most ecosystems

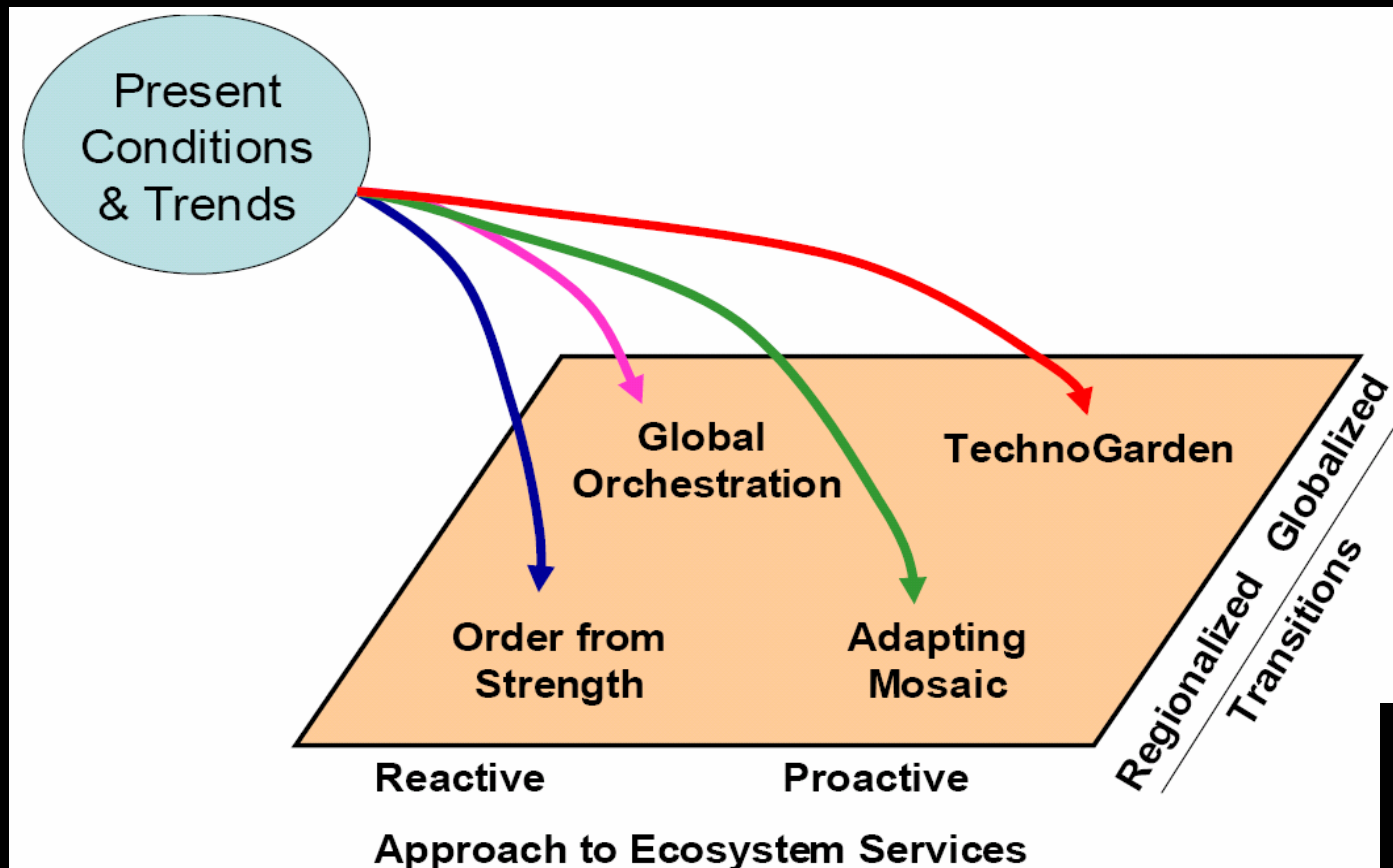
Finding #4:

- The challenge of reversing the degradation of ecosystems while meeting increasing demands for their services can be partially met under some scenarios that the MA considered but these involve significant changes in policies, institutions and practices, that are not currently under way
- Many options exist to conserve or enhance specific ecosystem services in ways that reduce negative trade-offs or that provide positive synergies with other ecosystem services

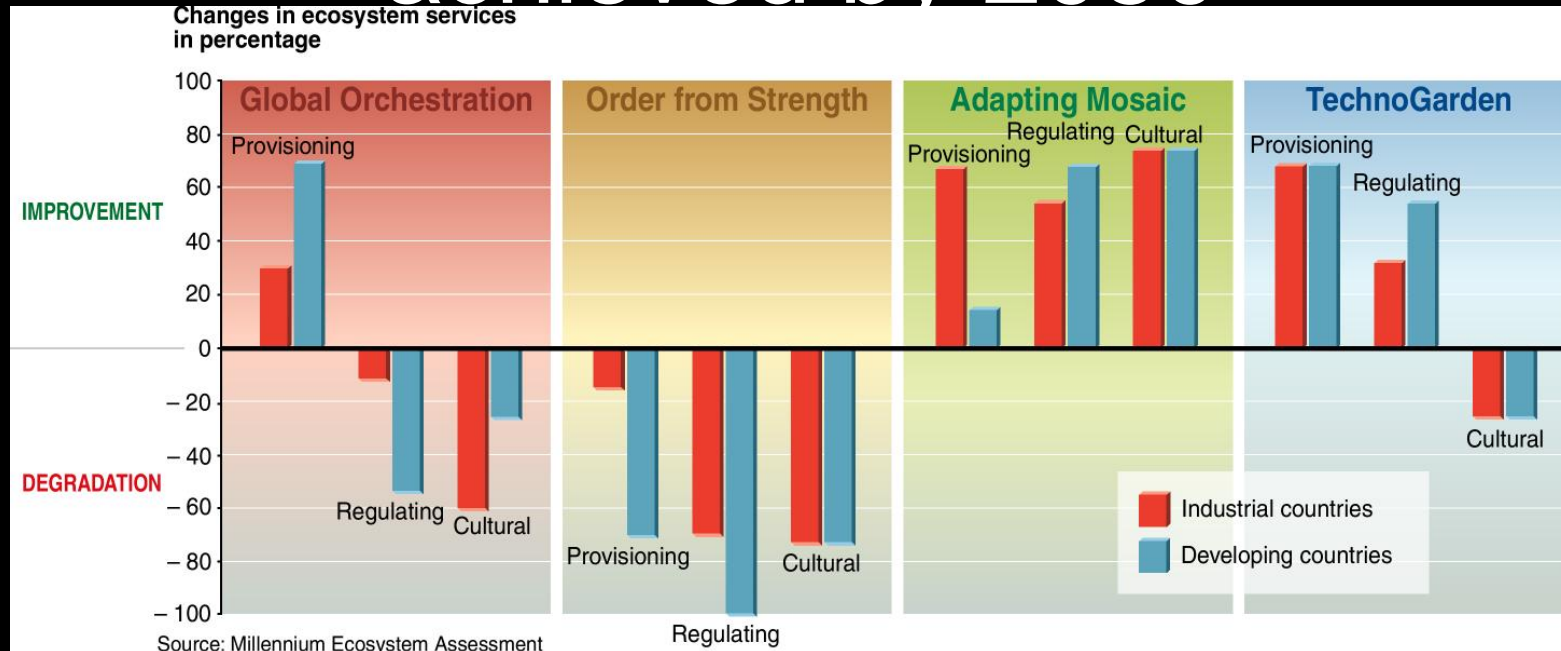


MA Scenarios

- Not predictions – scenarios are plausible futures
- Both quantitative models and qualitative analysis used in scenario development



Improvements in services can be achieved by 2050



- **Three of the four scenarios show that significant changes in policy can partially mitigate the negative consequences of growing pressures on ecosystems, although the changes required are large and not currently under way**

Examples of changes in policies and practices that yield positive outcomes

- Global Orchestration
 - Major investments in public goods (e.g., education, infrastructure) and poverty reduction
 - Trade barriers and distorting subsidies eliminated
- Adapting Mosaic
 - Widespread use of active adaptive management
 - Investment in education (countries spend 13% of GDP on education, compared to 3.5% today)
- TechnoGarden
 - Significant investment in development of technologies to increase efficiency of use of ecosystem services
 - Widespread use of 'payments for ecosystem services' and development of market mechanisms



Promising Responses

- Institutions
 - Legislation to require integration of ecosystem management goals within other sectors and within broader development planning frameworks
 - Increased transparency and accountability of government and private-sector performance in ecosystem/natural resource management
 - A legislated and independent body to monitor the state of ecosystems and have policy tools to react when ecosystems come under stress– similar to the Federal Reserve
- Economics
 - Elimination of subsidies that promote excessive use of ecosystem services (and, where possible, transfer these subsidies to payments for non-marketed ecosystem services)
 - Greater use of economic instruments and market-based approaches in the management of ecosystem services (where enabling conditions exist)

Promising Responses

- Technology
 - Promotion of technologies that enable increased crop yields without harmful impacts
 - Restoration of ecosystem services
 - Promotion of technologies to achieve sustainable production pathways
- Social and Behavioral
 - Measures to reduce aggregate consumption
 - Communication and education
 - Empowerment of groups directly dependent on ecosystem services
- Knowledge
 - Incorporation of nonmarket values of ecosystems in resource management decisions
 - Enhancement of human and institutional capacity on ecosystem management

