

# Millennium Ecosystem Assessment

## **What is the Millennium Ecosystem Assessment (MA)?**

The Millennium Ecosystem Assessment (MA) was called for by the United Nations Secretary-General Kofi Annan in 2000. Initiated in 2001, the objective of the MA was to assess the consequences of ecosystem change for human well-being and the scientific basis for action needed to enhance the conservation and sustainable use of those systems and their contribution to human well-being. The MA has involved the work of more than 1,360 experts worldwide. Their findings, contained in five technical volumes and six synthesis reports, provide a state-of-the-art scientific appraisal of the condition and trends in the world's ecosystems and the services they provide (such as clean water, food, forest products, flood control, and natural resources) and the options to restore, conserve or enhance the sustainable use of ecosystems.

## **What are the main findings of the MA?**

1. Over the past 50 years, humans have changed ecosystems more rapidly and extensively than in any comparable period of time in human history, largely to meet rapidly growing demands for food, fresh water, timber, fiber and fuel. This has resulted in a substantial and largely irreversible loss in the diversity of life on Earth.
2. The changes that have been made to ecosystems have contributed to substantial net gains in human well-being and economic development, but these gains have been achieved at growing costs in the form of the degradation of many ecosystem services, increased risks of nonlinear changes, and the exacerbation of poverty for some groups of people. These problems, unless addressed, will substantially diminish the benefits that future generations obtain from ecosystems.
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.
4. The challenge of reversing the degradation of ecosystem while meeting increasing demands for services can be partially met under some scenarios considered by the MA, but will 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.

The bottom line of the MA findings is that human actions are depleting Earth's natural capital, putting such strain on the environment that the ability of the planet's ecosystems to sustain future generations can no longer be taken for granted. At the same time, the assessment shows that with appropriate actions it is possible to reverse the degradation of many ecosystem services over the next 50 years, but the changes in policy and practice required are substantial and not currently underway.

## **What is new about the MA findings?**

**The MA, like the Intergovernmental Panel on Climate Change (IPCC), assessed current knowledge, scientific literature, and data. Thus, at the most basic level, assessments of this nature synthesize information that has previously been available, and do not**

**present new research findings. Nevertheless, three aspects of the MA do represent important new contributions.**

- First, the findings of this assessment are the consensus view of the largest body of social and natural scientists ever assembled to assess knowledge in this area. The availability of this broad consensus view of scientists is an important contribution to decision-making. The assessment identifies where broad consensus exists on findings but also where the information is insufficient to reach firm conclusions.

- Second, the focus of this assessment on ecosystem services and their link to human well-being and development needs is unique. By examining the environment through the framework of ecosystem services, it becomes much easier to identify how changes in ecosystems influence human well-being and to provide information in a form that decision-makers can weigh alongside other social and economic information.

- Third, the assessment identified a number of ‘emergent’ findings, conclusions that can only be reached when a large body of existing information is examined together. Four of these stand out:

- o The balance sheet. Although individual ecosystem services have been assessed previously, the finding that 60% of a group of 24 ecosystem services examined by the MA are being degraded is the first comprehensive audit of the status of Earth’s natural capital.

- o Nonlinear changes. Nonlinear (accelerating or abrupt) changes have been previously identified by a number of individual studies of ecosystems. The MA is the first assessment to conclude that ecosystem changes are increasing the likelihood of nonlinear changes in ecosystems and the first to note the important consequences of this finding for human well-being. Examples of such changes include disease emergence, abrupt alterations in water quality, the creation of “dead zones” in coastal waters, the collapse of fisheries, and shifts in regional climate.

- o Drylands. Because the assessment focuses on the linkages between ecosystems and human well-being, a somewhat different set of priorities emerge from it. While the MA does confirm that major problems exist with tropical forests and coral reefs, from the standpoint of linkages between ecosystems and people, the most significant challenges involve dryland ecosystems. These ecosystems are particularly fragile, but they are also the places where human population is growing most rapidly, biological productivity is least, and poverty is highest.

- o Nutrient loading. The MA confirms the emphasis that decision-makers are already giving to addressing important drivers of ecosystem change such as climate change and habitat loss. But the MA finds that excessive nutrient loading of ecosystems is one of the major drivers today and will grow significantly worse in the coming decades unless action is taken. The issue of excessive nutrient loading, although well studied, is not yet receiving significant policy attention in many countries or internationally.

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## **Living Beyond Our Means: Natural Assets and Human Well-being**

This statement was developed by the Board governing the MA process, whose membership includes representatives from U.N. organizations, governments through a number of international conventions, nongovernmental organizations, academia, business, and indigenous peoples. See full list of Board members.

The statement from the Board identifies 10 key messages and conclusions that can be drawn from the assessment:

- Everyone in the world depends on nature and ecosystem services to provide the conditions for a decent, healthy, and secure life.
- Humans have made unprecedented changes to ecosystems in recent decades to meet growing demands for food, fresh water, fiber, and energy.
- These changes have helped to improve the lives of billions, but at the same time they weakened nature's ability to deliver other key services such as purification of air and water, protection from disasters, and the provision of medicines.
- Among the outstanding problems identified by this assessment are the dire state of many of the world's fish stocks; the intense vulnerability of the 2 billion people living in dry regions to the loss of ecosystem services, including water supply; and the growing threat to ecosystems from climate change and nutrient pollution.
- Human activities have taken the planet to the edge of a massive wave of species extinctions, further threatening our own well-being.
- The loss of services derived from ecosystems is a significant barrier to the achievement of the Millennium Development Goals to reduce poverty, hunger, and disease.
- The pressures on ecosystems will increase globally in coming decades unless human attitudes and actions change.
- Measures to conserve natural resources are more likely to succeed if local communities are given ownership of them, share the benefits, and are involved in decisions.
- Even today's technology and knowledge can reduce considerably the human impact on ecosystems. They are unlikely to be deployed fully, however, until ecosystem services cease to be perceived as free and limitless, and their full value is taken into account.
- Better protection of natural assets will require coordinated efforts across all sections of governments, businesses, and international institutions. The productivity of ecosystems depends on policy choices on investment, trade, subsidy, taxation, and regulation, among others.

#### **Ecosystem Change**

<http://www.greenfacts.org/en/ecosystems/index2.htm>

#### **World Data Center for Biodiversity and Ecology**

<http://wdc.nbi.gov/ma/>

#### **Millennium Assessment Full Reports**

<http://www.millenniumassessment.org/en/Index.aspx>