



Ecosystem

MOUNTAIN AND POLAR

- Food
- Fibre
- Freshwater
- Erosion control
- Climate regulation
- Recreation and ecotourism
- Aesthetics
- Spiritual values

FOREST AND WOODLAND

- Food
- Timber
- Freshwater
- Fuelwood
- Flood regulation
- Disease regulation
- Carbon sequestration
- Local climate regulation
- Medicines
- Recreation
- Aesthetics
- Spiritual values
- Soil stabilization
- Animal habitat
- Waste processing

INLAND WATER, RIVERS AND OTHER WETLANDS

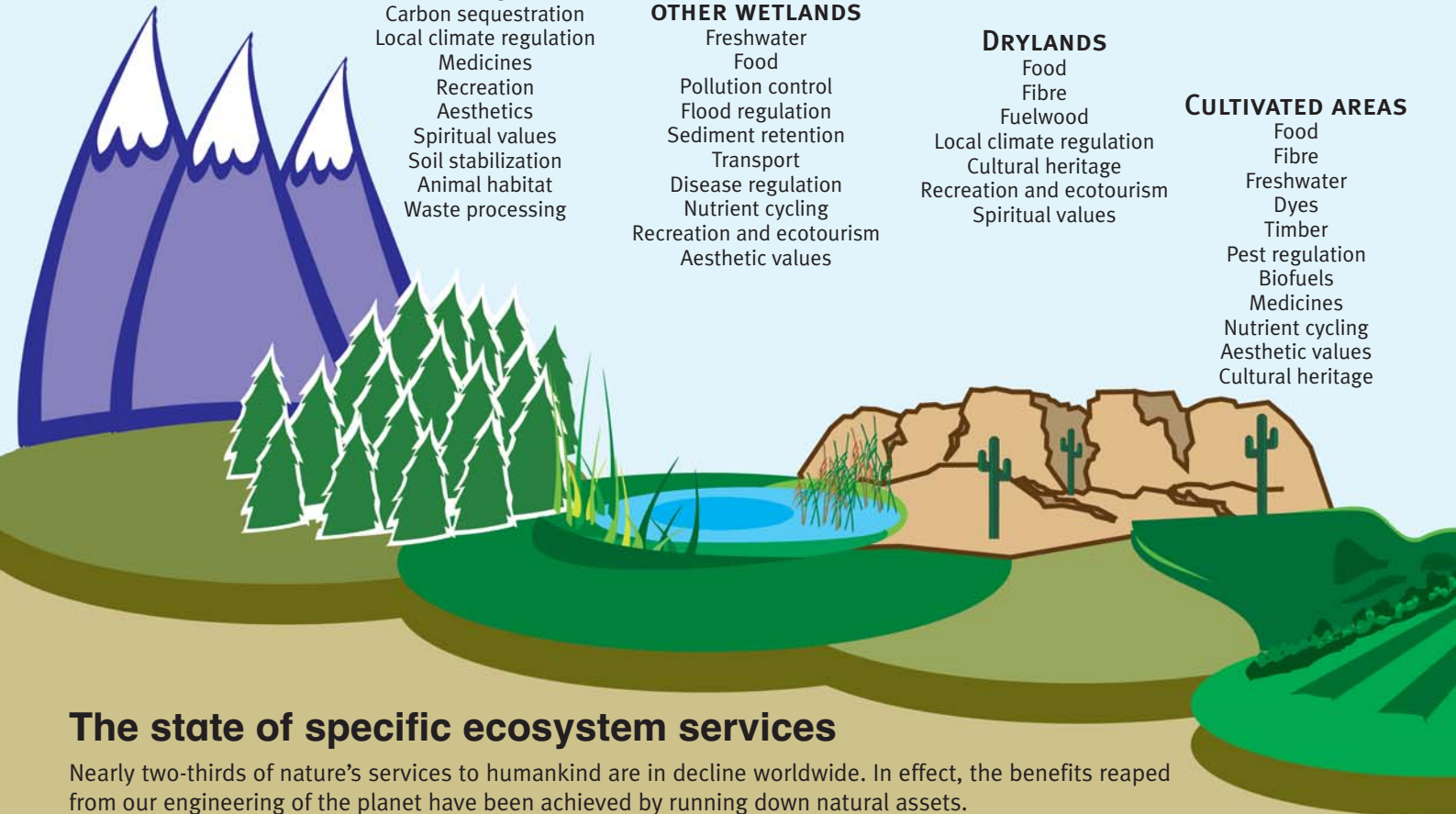
- Freshwater
- Food
- Pollution control
- Flood regulation
- Sediment retention
- Transport
- Disease regulation
- Nutrient cycling
- Recreation and ecotourism
- Aesthetic values

DRYLANDS

- Food
- Fibre
- Fuelwood
- Local climate regulation
- Cultural heritage
- Recreation and ecotourism
- Spiritual values

CULTIVATED AREAS

- Food
- Fibre
- Freshwater
- Dyes
- Timber
- Pest regulation
- Biofuels
- Medicines
- Nutrient cycling
- Aesthetic values
- Cultural heritage



The state of specific ecosystem services

Nearly two-thirds of nature's services to humankind are in decline worldwide. In effect, the benefits reaped from our engineering of the planet have been achieved by running down natural assets.

PROVISIONING SERVICES

Service	Subcategory	Status	Reasons for change
Food	Crops	▲	Substantial production increase
	Livestock	▲	Substantial production increase
	Capture fisheries	▼	Overharvesting
	Aquaculture	▲	Substantial production increase
	Wild foods	▼	Habitat destruction
Fibre	Timber	◀▶	Forest loss in some areas; growth in others
	Cotton, hemp, silk	◀▶	Declining production of some; growth of others
	Wood fuel	▼	Declining production
Genetic resources		▼	Extinction; crop genetic resource loss
Biochemicals, natural medicines, pharmaceuticals		▼	Extinction; overharvesting
Water	Freshwater	▼	Unsustainable human consumption

REGULATING SERVICES

Service	Subcategory
Air-quality regulation	
Climate regulation	Global
	Regional and local
Water regulation	
Erosion regulation	
Water purification and waste treatment	
Disease regulation	
Pest regulation	
Pollination	
Natural hazard regulation	

WHAT'S IT ALL WORTH?

How much are ecosystems worth? It's next to impossible to work out the monetary value of all their products – such as food, water, timber, medicine, climate regulation, recreation and aesthetics – but they are, of course, essential to our lives and economies.

One attempt to calculate the value of ecosystems suggests that the planet's forests are worth \$4.7 trillion, about one-tenth of the world's gross product. To look at it another way, about half of all Western medicines – worth many billions of dollars – originated in nature. Aspirin, for example, was originally synthesized from willow bark.

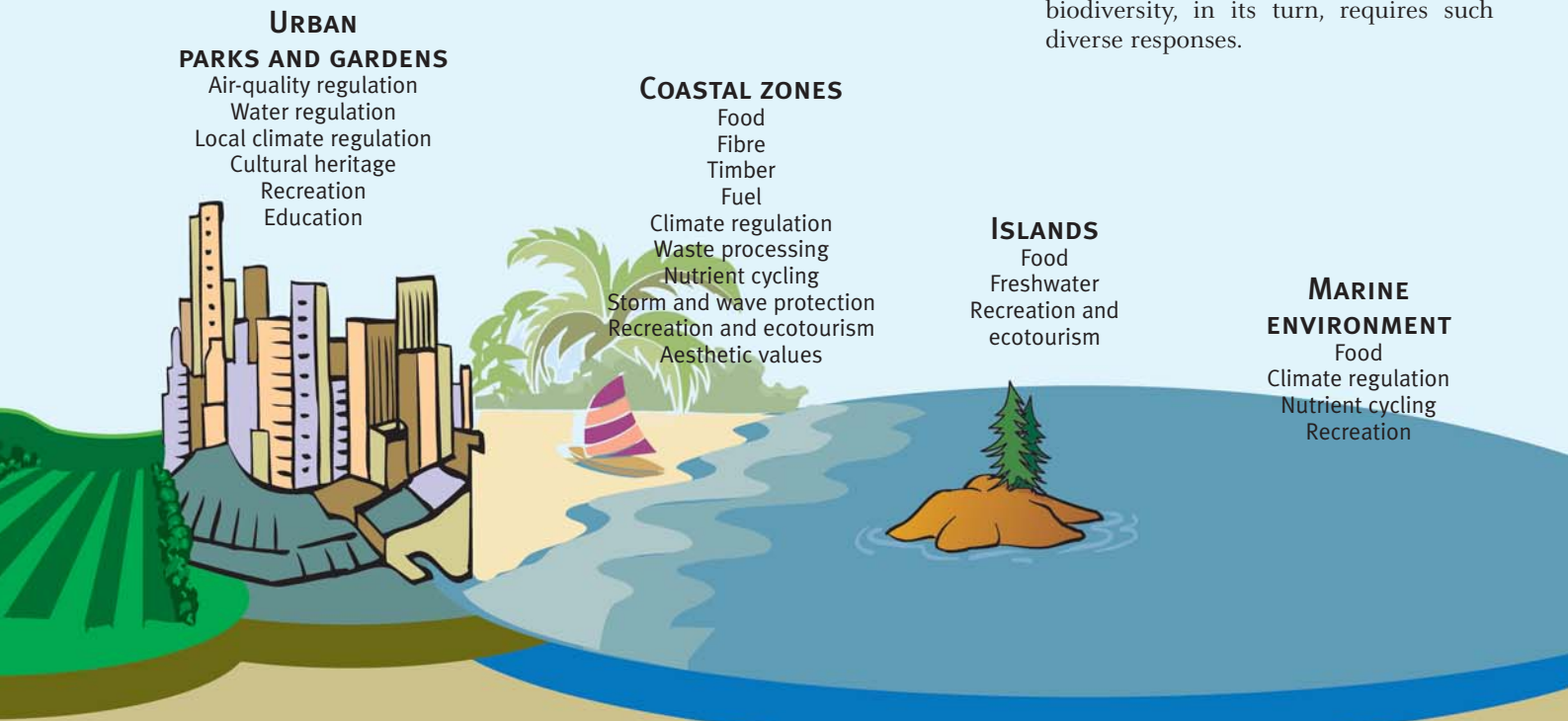
Humanity has recently made an unprecedented impact on natural eco-

systems in order to supply itself with food, water, fibre and energy. Sometimes the result has helped improve millions of lives, but more often, quite apart from the loss of biodiversity, nature's vital services have been weakened. Wetlands have often been drained for farmland – at the cost of devastating the fisheries that use them for nurseries – and lose their ability to cleanse water of pollution.

Similarly, mass deforestation – from the Amazon to Indonesia – yields timber and clears land for agriculture, but at a terrible price. Local people are hardest hit as the forest goods and services on which they depend are lost. But people living downstream can be flooded out of their homes because the forests that once held, and gently released, rainwater have been felled. And there are worldwide effects too; fewer trees mean more carbon dioxide in the atmosphere, and therefore more global warming.

It is not easy to work out to what degree natural systems can be safely exploited since they are not fully understood – partly because they are rarely valued. But once they are lost, it is difficult, often impossible, to restore them.

This is all likely to get worse in coming decades. So what can be done? Quite a lot, actually. Information campaigns can alter attitudes. Certification programmes that identify sustainably produced products help consumers buy green. Some governments now pay landowners who manage their lands to preserve water quality, absorb carbon dioxide or conserve other ecosystem services. Creating national parks and other protected areas – and providing more money and management support to the existing ones – also helps. Many businesses already develop environmentally friendly technologies, and they can be encouraged to do more. Protecting biodiversity, in its turn, requires such diverse responses.



Status	Reasons for change
▼	Decline in atmosphere's ability to cleanse itself
▲	Net source of carbon sequestration since mid 20th century
▼	Preponderance of negative impacts
◀▶	Varies depending on area
▼	Increased soil degradation
▼	Declining water quality
◀▶	Varies depending on ecosystem change
▼	Natural control degraded by the use of pesticides
▼	Apparent global decline in abundance of pollinators
▼	Fewer natural buffers

services



CULTURAL SERVICES		
Service	Status	Reasons for change
Spiritual values	▼	Rapid decline in sacred groves and species
Aesthetic values	▼	Decline in quantity and quality of natural lands
Recreation and ecotourism	◀▶	More areas accessible but many degraded

Source: MEA