



**making the economic case
for nature-based solutions:**
valuing and investing in forests
as natural climate infrastructure

Lucy Emerton

**the
problem:**
ecosystem
undervaluation

**making
the case:**
the need
for economic
evidence

**modifying
the figures:**
rethinking
benefit & cost
calculations

**closing
the loop:**
why economic
evidence isn't
enough

**in
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posing the
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nature-based solutions

A scenic landscape photograph of a valley. In the foreground, there are lush green fields and a river winding through them. The middle ground shows a valley floor with more greenery and some structures. In the background, there are several layers of mountains, some with a reddish-brown hue, under a clear blue sky with a few white clouds. The overall scene is bright and vibrant, suggesting a healthy, natural environment.

“... actions to **protect, sustainably manage and restore** natural or modified ecosystems, which **address societal challenges** effectively and adaptively, while simultaneously providing **human well-being and biodiversity** benefits ...”

the challenge of under-valuation



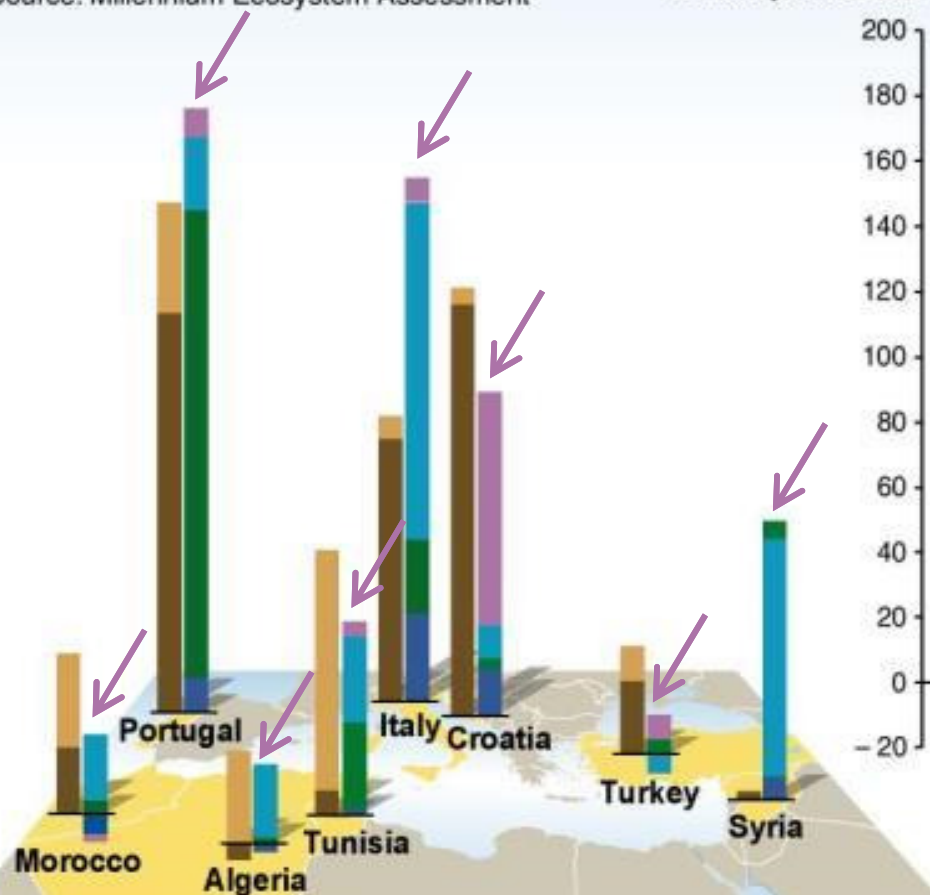
Left column: Commonly measured economic values

Grazing

- Watershed protection
- Non-timber forest products
- Recreation and hunting

Source: Millennium Ecosystem Assessment

Total economic value
dollars per hectare

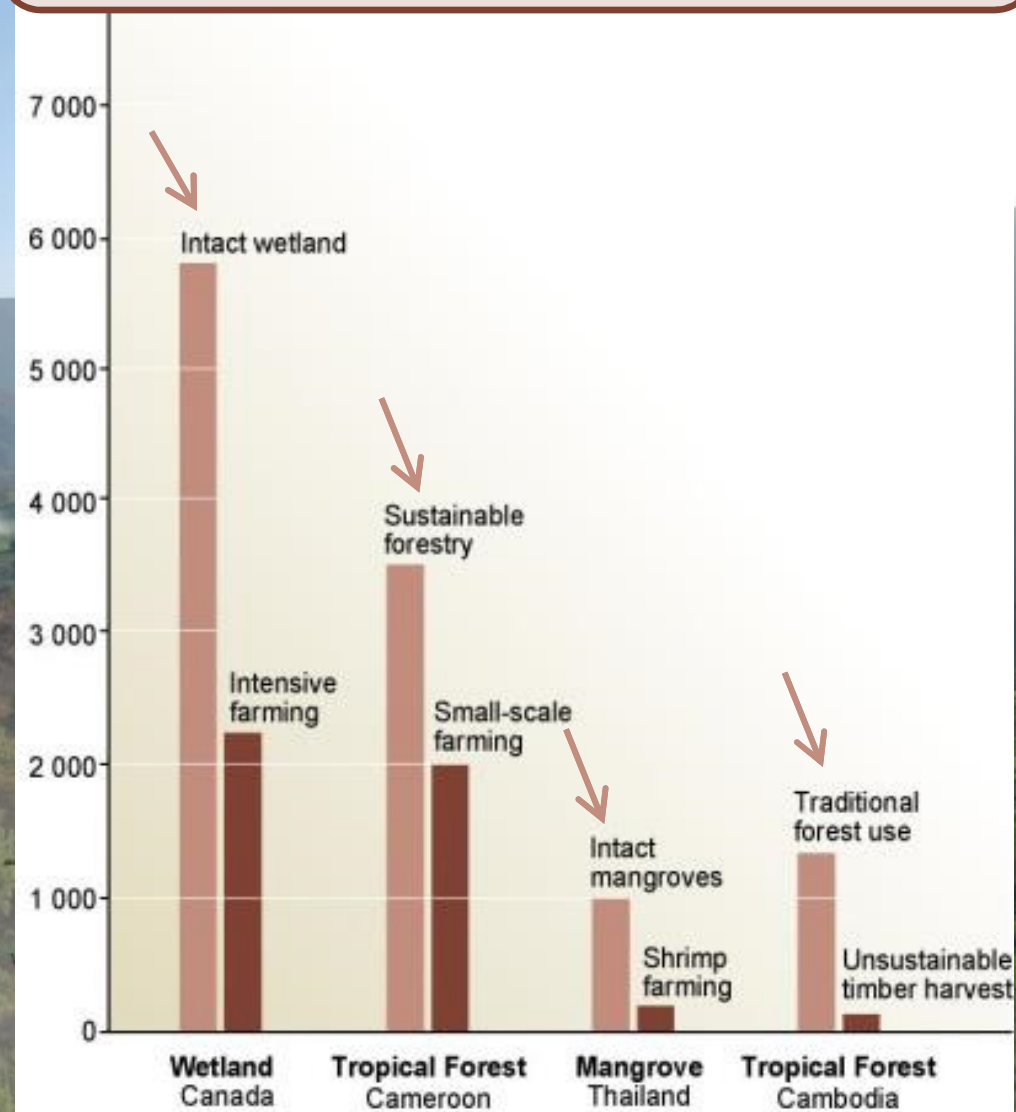


Net Present Value in dollars per hectare

10 000

Sustainably managed ecosystems

strong economic rationale
for ecosystem conservation



value of Middle East/North Africa ecosystem services & economic costs of land degradation

total economic value of
terrestrial ecosystem services

US\$ 644 billion/yr
31.6% of GDP

economic cost of
land degradation

land use/cover change
(ecosystem service values)

US\$ 10.4 billion/yr

cropland degradation
(crops, soils & carbon)

US\$ 4.1 billion/yr

pastureland degradation
(milk & meat production)

US\$ 128.9 million/yr

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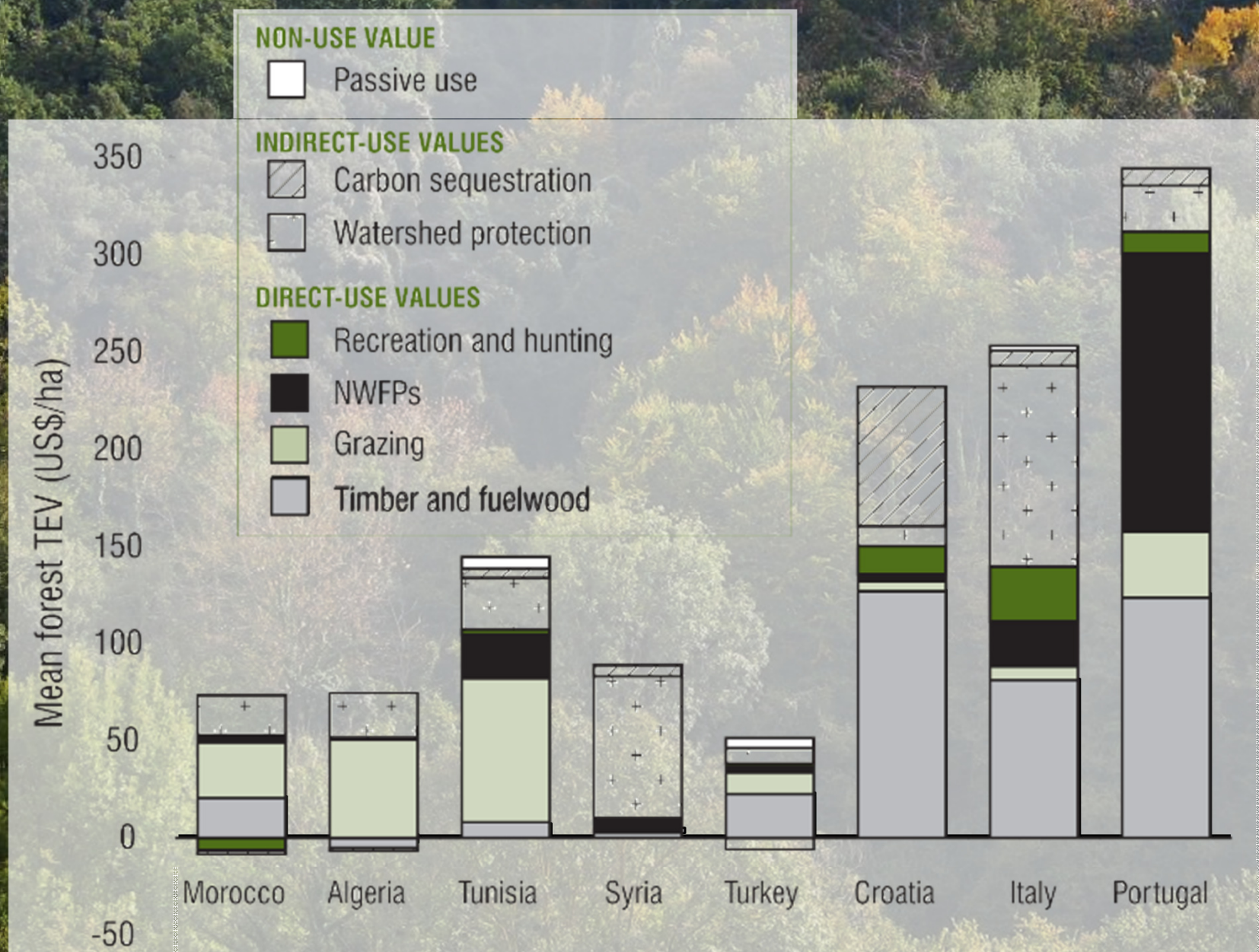
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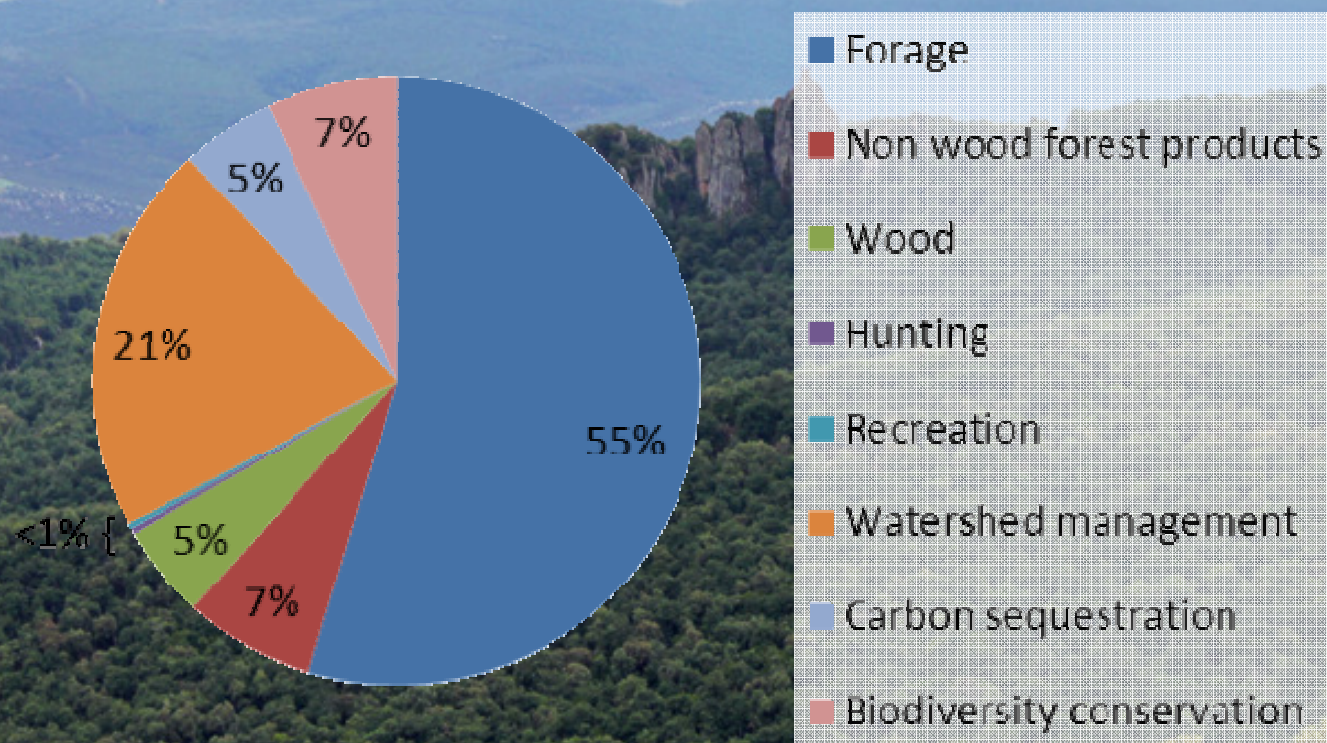


value of forest ecosystem services in the Mediterranean



value of Tunisian forest ecosystem services

- total value of **USD 142 million**, equivalent to **USD 120/ha** or **0.3% of GDP**
- worth more than **20 times** current government forest revenues
- 61% of value accrues to **local populations**, 27% to **wider economy and government**, 12% to **international community**



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ecosystem accounting for Andalusian forests

- **total opening capital** for environmental assets €41.2 billion
- **annual environmental income** €1.42 billion
- **gross value-added** of forests in extended accounts is 3.6 times higher than conventional accounts

Extended opening capital of Andalusian forests (2010).

Class	Environmental asset		Total (€·10 ⁶)
	Farmer (€·10 ⁶)	Government (€·10 ⁶)	
	1387		1387
Timber	1023		1023
Cork	322		322
Firewood	23		23
Nuts	2058		2058
Grazing			767
Conservation forestry	767		767
Hunting			14,355
Residential	14,355		14,355
Amenity			5941
Fire services		5941	5941
Recreation		1414	1414
Mushrooms		3172	3172
Carbon		4928	4928
Landscape		1676	1676
Biodiversity		4132	4132
Water		21,263	21,263
Total	19,934		41,167

economic returns to rangeland rehabilitation in Jordan

benefits of large-scale rangeland restoration in Zarqa River Basin through Hima system **far outweigh costs** when calculated over 25 years

Pastoralist communities avoided costs & losses	USD 24 million
Groundwater recharge & water supplies	USD 266 million
Reduced sediment load into King Talal dam	307,500 tonnes
Overall benefits to Jordanian economy	USD 200-400 million

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payment for forest ecosystem services (PES) in Albania

erosion a major problem in Ulza River Basin for hydropower & irrigation

challenge is to make forest conservation **economically worthwhile** for farmers and herders in upper watershed

strongly **correlated to land use** (bare lands give 3 times higher sediment loads than oak, beech and pine forests)

user-led PES scheme under development, involving transfers from downstream water users to Forest and Pasture Users' Association

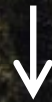


ecological-fiscal transfers in Portugal

Nature Conservation Areas included in local finances law as criteria to determine budget transfers from central government to municipalities



between 5-10% of General Municipal Fund is **distributed according to amount of territory under protected areas** or Natura 2000 status



aims to **compensate conservation costs & reward provision of national benefits**



- **ecosystem service assessment & valuation** of existing land use/cover types
- modelling of **biophysical and socio-economic impacts** of land use change, and of different forest management and restoration interventions
- scenario assessment of **beneficiaries, cost-bearers** and **trade-offs**
- scoping of **payment for ecosystem services** options to secure sustainable forest finance and incentives for ecosystem service providers

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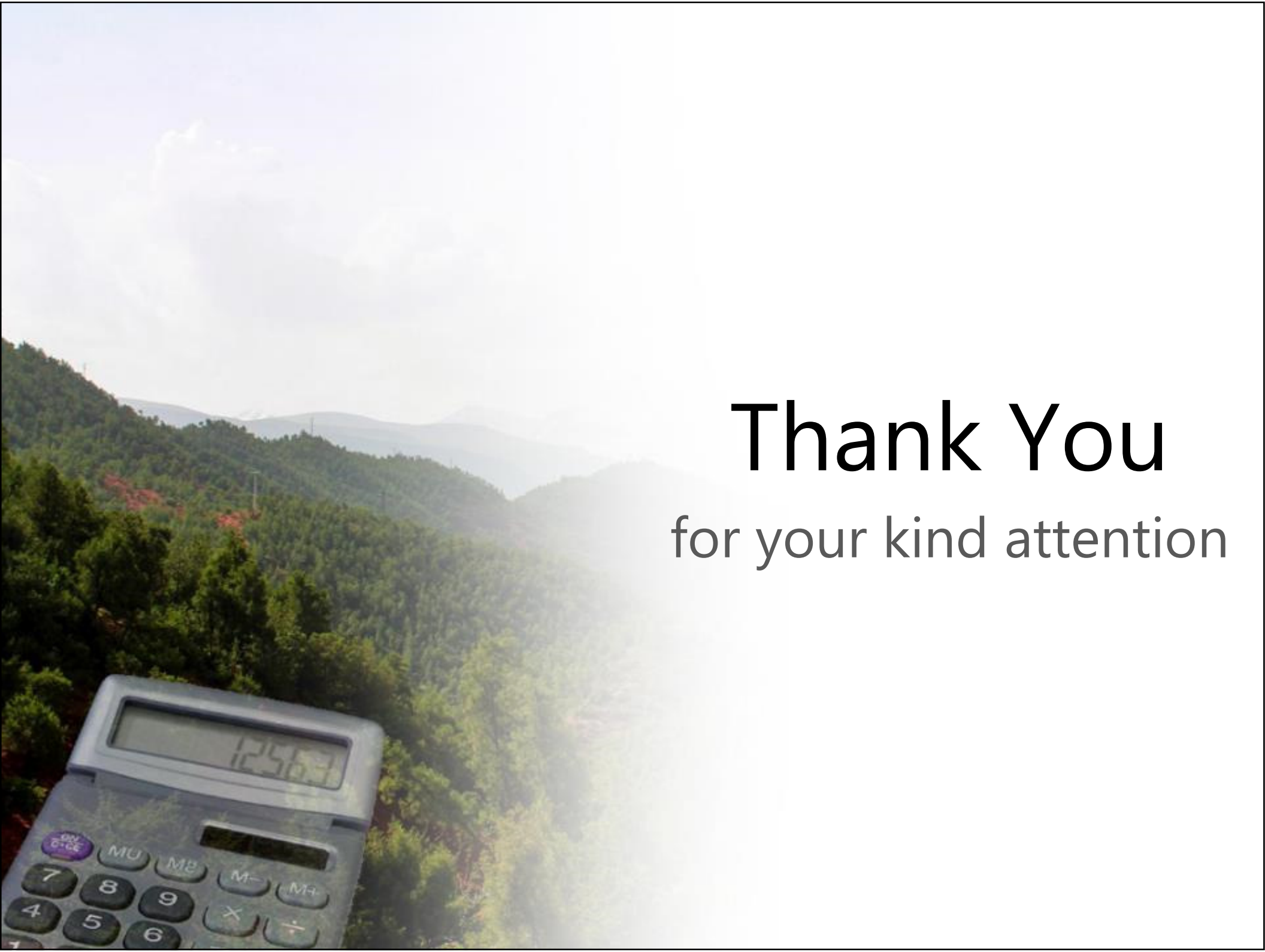
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- there is a continuing need to **correct the balance sheet** and **make the economic case** for nature-based solutions ...
- yet, although there is a **growing evidence base** on the value of forest ecosystem services for climate and other co-benefits ...
- ... it still remains a challenge to deliver the **economic incentives and financing mechanisms** which will stimulate public and private investments in forest restoration, conservation and sustainable use

A scenic view of a forested mountain valley with a calculator in the foreground. The calculator is a grey, handheld device with a digital display showing the number 1256.3. The background features rolling green hills and mountains under a bright, slightly hazy sky. The calculator is positioned in the bottom left corner, partially overlapping the landscape.

Thank You
for your kind attention