Monetary Valuation in National Ecosystem Assessments

Potential opportunities and impacts (and risks!)

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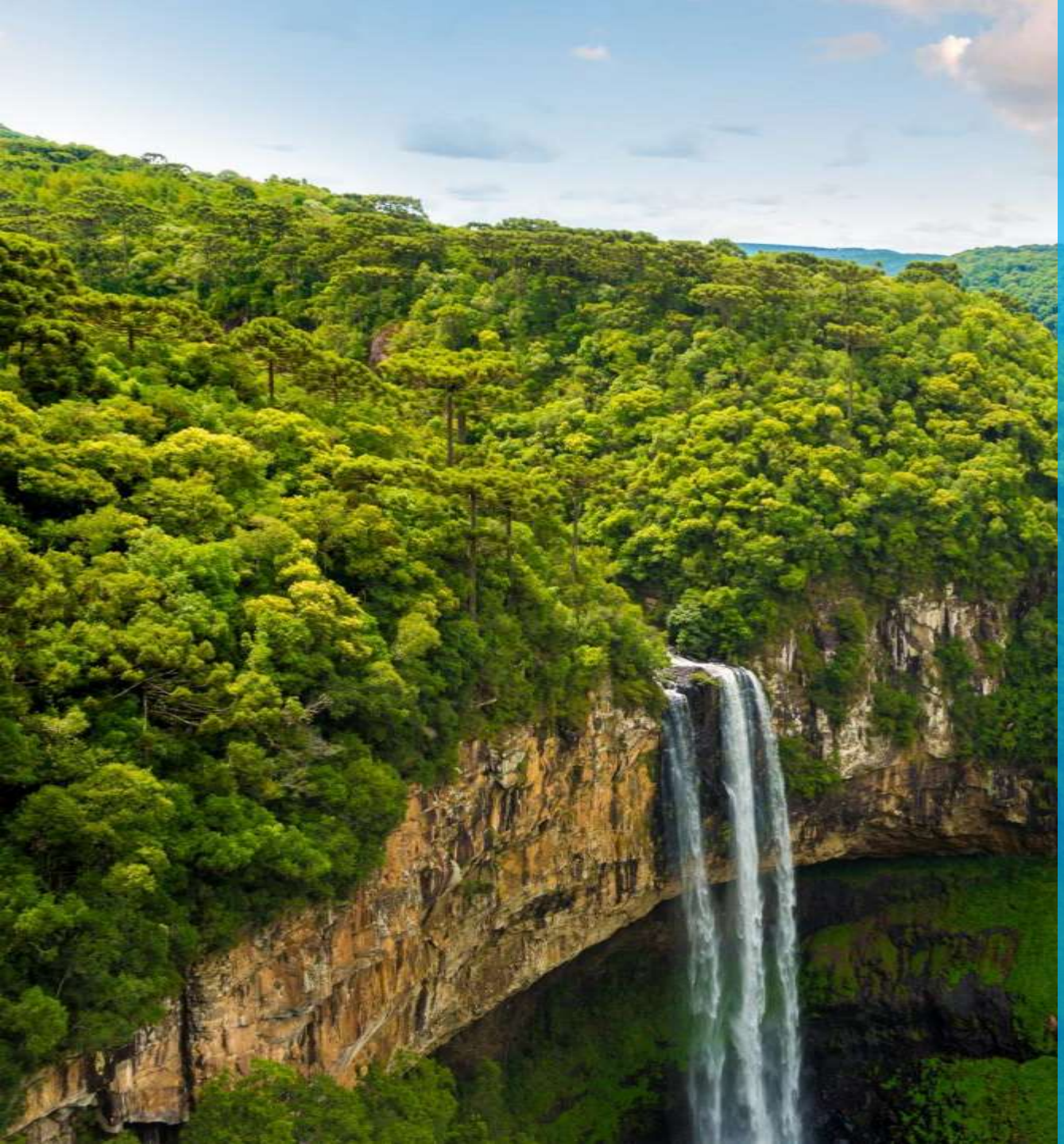
UN environment programme WCMC



Contents

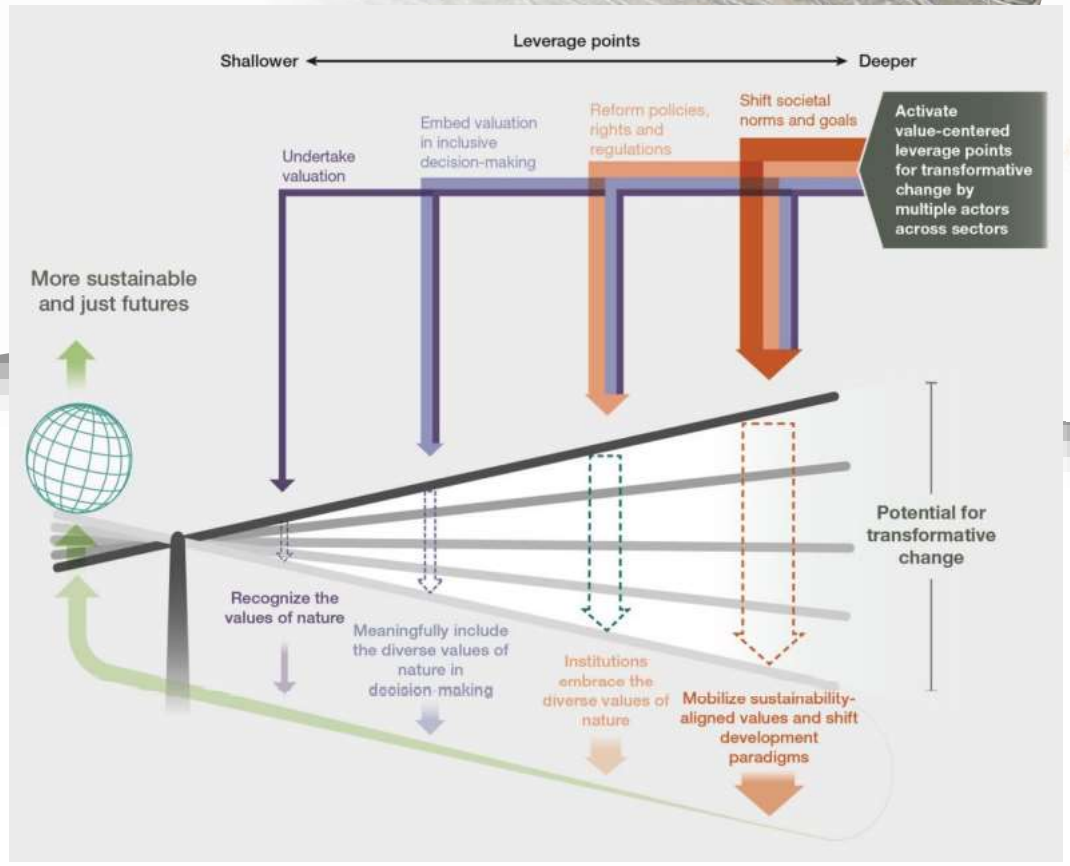
- A quick intro to valuation
- A look a monetary valuation in the UK and the difference that it made
- Some notes on finding and using monetary values

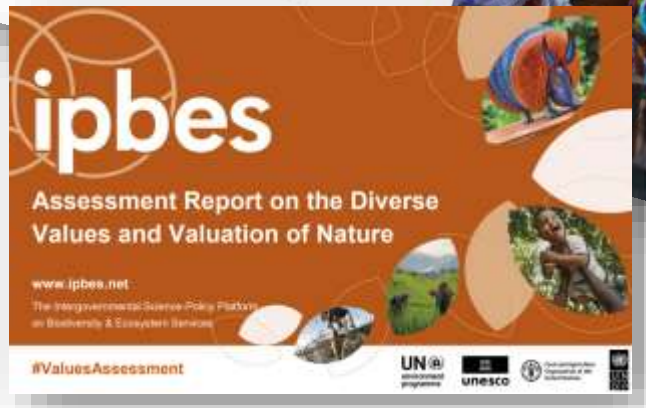
Why value and what to value

The way nature is valued is one of the main drivers of the global biodiversity crisis but it is also an opportunity to address it.

Economic and political decisions have predominantly prioritised market-based instrumental values of nature.

- Predominant economic and political decisions have prioritized market-based instrumental values ignoring non-market instrumental, relational and intrinsic values.
- Conservation policies also risk downplaying the values of local communities that depend on nature for their livelihoods.





Examples of valuation methods		Relevance: Ability to elicit of diverse values in multiple socio-ecological contexts		Robustness: Ability to ensure reliable (accurate and valid) and fair representation of stakeholders		Resources: Affordability and ease of use		Level of confidence
		Diverse values	Diverse contexts	Reliability	Representation	Ease of implementation	Ease of operation	
Nature based valuation	Ecosystem services mapping							✓
	Biodiversity mapping							✓
Statement based valuation	Stated preferences							✓
	Q method							~
Behaviour based valuation	Revealed preference							✓
	Livelihood assessment							✓
Integrated valuation	Integrated modelling							~
	Participatory mapping							✓
Decision making tools based on integration of values	Cost-benefit analysis							✓
	Multi-criteria decision aid							✓
	Deliberative integration methods							~
Methods that do not elicit value information	Benefit transfer							~
Examples from valuation by indigenous peoples and local communities	Forest health monitoring (forest walks, territory patrols)	Capable individuals (i.e.,human resources to conduct validation) are entrusted (i.e., assurance of robustness) to assess forest recovery using communally accepted indicators relevant for multiple uses by the community (i.e., representation and diverse values).						✓
	Community assemblies for deliberations	Community meetings to gather all members' opinions (including women's and children's) about nature (i.e., representation/robustness, relevance) and to jointly interpret the opinions and deliberate on how to move forward (i.e., capacities to conduct valuation). Community members are trusted to speak based on their knowledge and lived experiences (i.e., reliability).						✓

How to measure values…

There is no shortage of methods and approaches to value nature.

Over 50 different methods to assess nature's values have been applied in diverse social- ecological contexts around the world

https://ipbes.net/the-values-assessment

Why move to monetary valuation? (UK NEA example)

http://uknea.unep-wcmc.org/Resources/tabid/82/Default.aspx - see 2011 Synthesis Document (scroll down)

Table 1 Summary impacts for the changes from the 2000 baseline to 2060 under each of the UK NEA Scenarios (low climate change scenario) in Great Britain (£million per year). Positive numbers indicate improvements from the baseline (negative numbers indicate worsening situations). The last but one row ranks the Scenarios when only their market values are considered (1= highest value; 6 = lowest values with green values being positive and purple indicating negatives). The final row repeats this ranking when all values (market and non-market) are considered. Scenarios are as follows: GF = *Go with the Flow*; GPL = *Green and Pleasant Land*; LS = *Local Stewardship*; NS = *National Security*; NW = *Nature@Work*; WM = *World Markets*

	GF	GPL	LS	NS	NW	WM
Market agricultural output values *	220	-290	350	680	-510	420
Non-market GHG emissions †	-800	2,410	-100	3,590	4,590	-2,130
Non-market recreation ‡	5,710	6,100	1,540	4,490	24,170	5,040
Non-market urban greenspace ¶	-1,960	2,350	2,160	-9,940	4,730	-24,000
Total monetised values §	**3,170**	**10,570**	**3,950**	**-1,180**	**32,980**	**-20,670**
Rank: Market values only	4	5	3	1	6	2
Rank: All monetary values	4	2	3	5	1	6

* Change in total Great Britain farm gross margin.

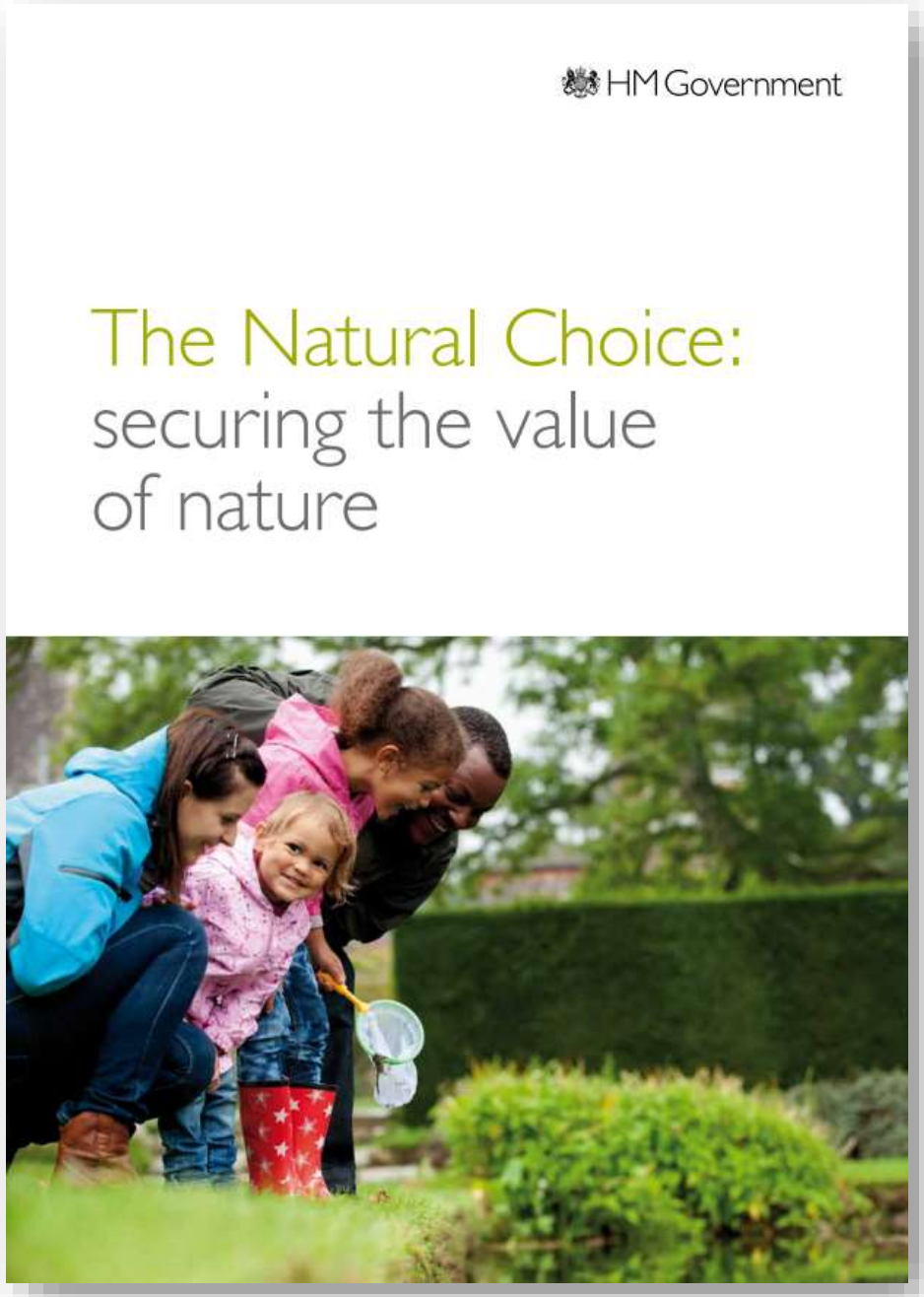
† Change from baseline year (2000) in annual costs of greenhouse gas (GHG) emissions from Great Britain terrestrial ecosystems in 2060 under the UK NEA Scenarios (millions £/year); negative values represent increases in annual costs of GHG emissions

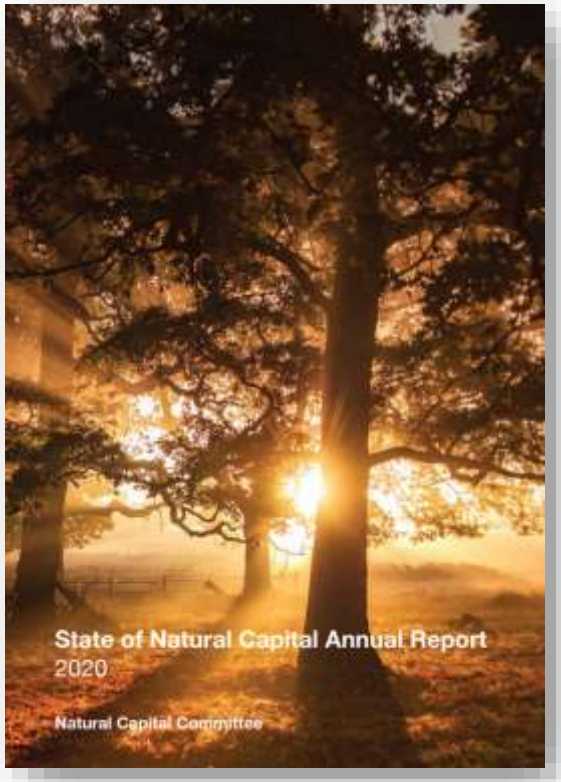
‡ Annual value change for all of Great Britain.

¶ Undiscounted annuity value; negative values indicate losses of urban greenspace amenity value.

§ We acknowledge some double counting between urban recreation and urban greenspace amenity value. Further data is needed to correct for this.

Protecting and increasing that value for people and the economy became a focus of the policy response





CAPITALS COALITION

Wealth Accounting and the Valuation of Ecosystem Services

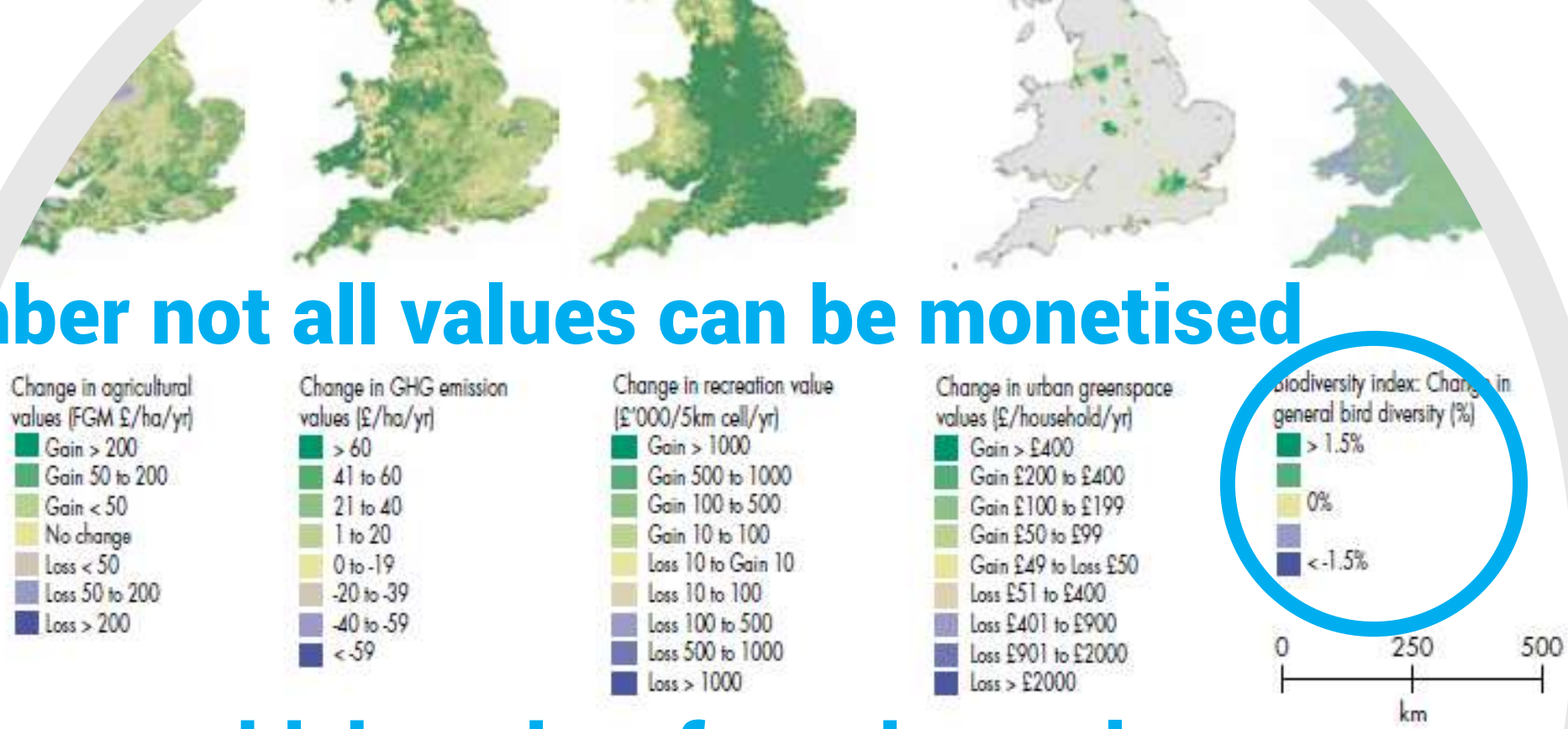
Office for National Statistics

Statistical bulletin

UK natural capital accounts: 2021

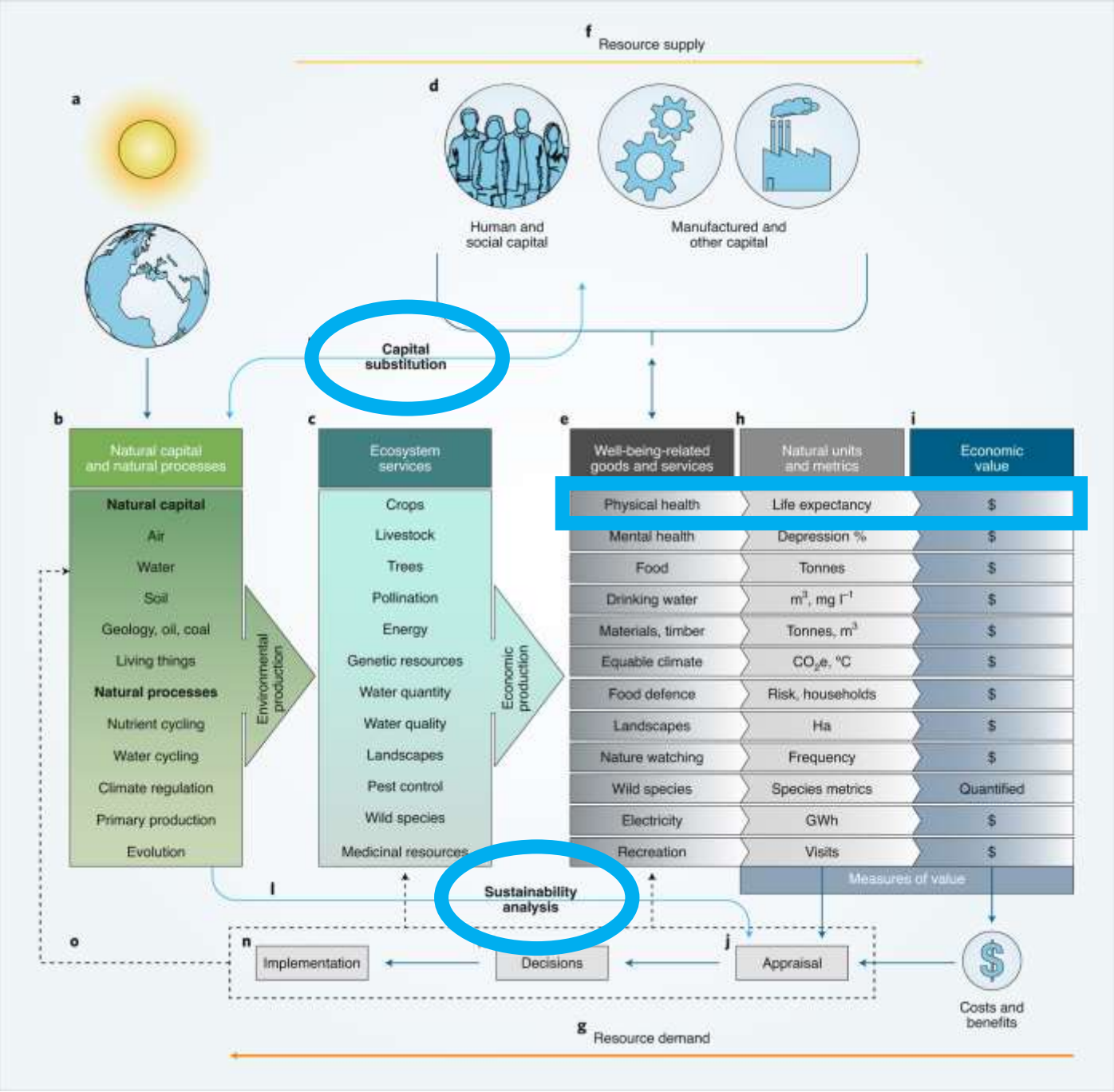
Estimates of the finanical and societal value of natural resources to people in the UK.

Remember not all values can be monetised



which makes focusing only on money values a risk

http://uknea.unep-wcmc.org/Resources/tabid/82/Default.aspx - see 2011 Synthesis Document (scroll down)



Perspective | Published: 08 July 2020

The natural capital framework for sustainably efficient and equitable decision making

Ian J. Bateman & Georgina M. Mace

Nature Sustainability **3**, 776–783 (2020) | Cite this article

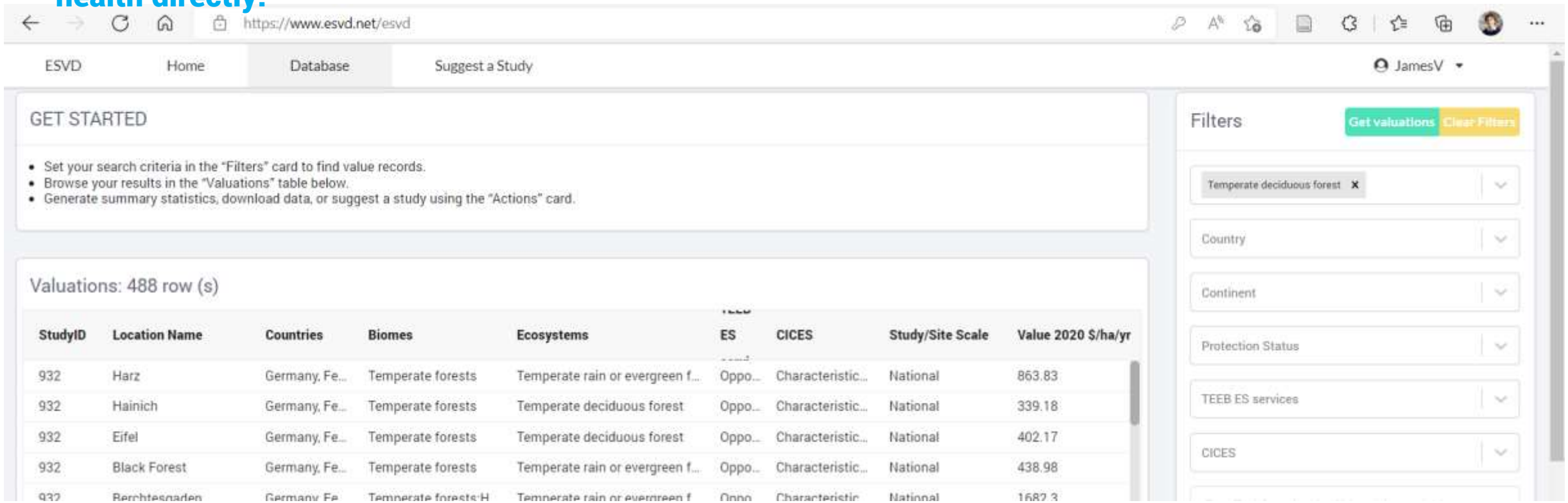
https://www.nature.com/articles/s41893-020-0552-3

You can miss other things by only looking at the monetary value of final ecosystem services

How to find monetary values

- **There are databases of ecosystem service valuation studies e.g. the ecosystem service valuation database (https://www.esvd.info/) but remember you may not always be looking for per hectare values of ecosystems**

- **Focus on the biophysical change that you want to monetise e.g. if you can quantify health impact (say in terms of Disability Adjusted Life Years) you want explore the values associated with changes in human health directly.**



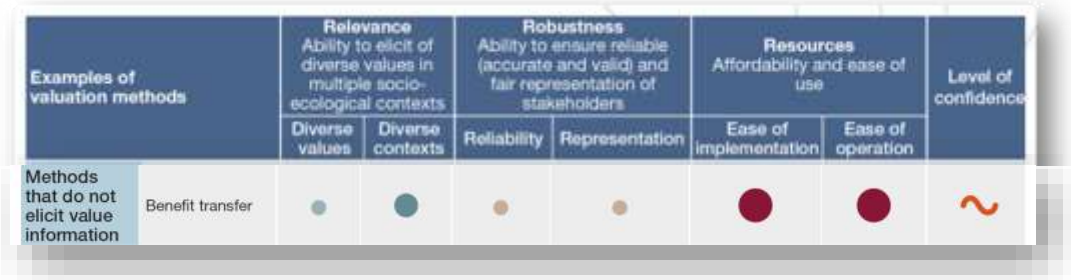
How to use monetary values (1)

Table 1: Some rules of thumb for choosing between value transfer approaches								
Selection Criteria	*A selection of possible policy good and study good 'matches'*							
i). The good	✓	✓	✓	✓	✓	✓	×	✓
ii). The change	✓	✓	✓	✓	×	✓	n/a	✓
iii). The location	✓	✓	✓	×	×	✓	n/a	✓
iv). The affected populations (characteristics)	✓	×	✓	×	×	× or ✓	n/a	✓
v). The number and quality of substitutes	✓	✓	×	×	×	× or ✓	n/a	✓
vi). The market constructs	✓	✓	✓	✓	✓	×	n/a	✓
Study quality	✓	✓	✓	✓	✓	✓	n/a	×
Rules of thumb:								
Unit value transfer:	👍	👍	👍	👍	👍	👍	👍	👍
Adjusted unit value transfer:	👍	👍	👍	?	?	?	👎	👎
Function transfer:	👍	👍	👍	👍	👍	?	👎	👎

Transfer with care

- **If you are using values from the existing literature, make sure that you are doing so appropriately**
- **Make sure the 'good' and context are similar enough for reuse, or use of adjusted figures to be reasonable.**

https://www.gov.uk/government/publications/valuing-environmental-impacts-guidelines-for-the-use-of-value-transfer



https://ipbes.net/the-values-assessment

How to use monetary values (2)

Make sure values make sense

- **Focus on changes that are interesting from a policy perspective**
- **Look at different scenarios**
- **Don't necessarily focus on money values alone. Biophysical information may be more interesting than money values in some cases e.g. nutritional security of local people vs the monetary value of dive tourists wellbeing associated with coral reefs**

Box from the abridged version of the Dasgupta Review of the Economics of Biodiversity >>>>>>

Box 4

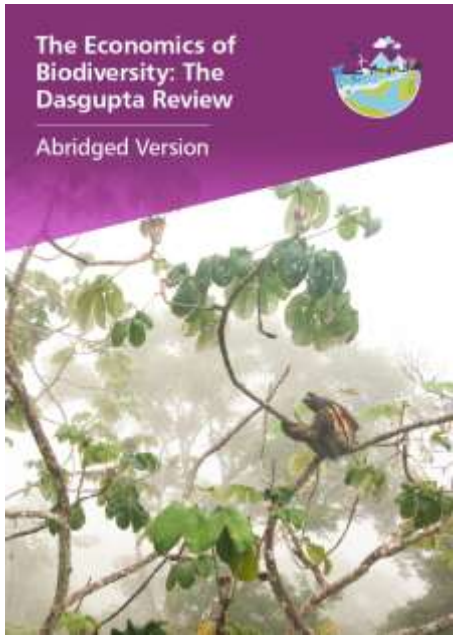
Absolute Values Are Meaningless

Absolute values of portfolios carry no information; only portfolio comparisons do. The value of a marginal change to the biosphere is meaningful because it is presumed that humanity will survive the change to experience it, but the matter is different when it comes to valuing Nature as a whole. It may be because growth and development economists ignored our place in the natural world, environmentalists some years ago were tempted to value the whole of Nature, to show that it is of great economic worth. In a widely cited publication in *Science*, the authors estimated that the global flow of the biosphere's services was, towards the end of the 20th century, worth US$16-54 trillion annually, with a point estimate of US$33 trillion (Costanza et al. 1997). As that figure was larger than global GDP in the mid-1990s, we were meant to appreciate the economic significance of natural capital.

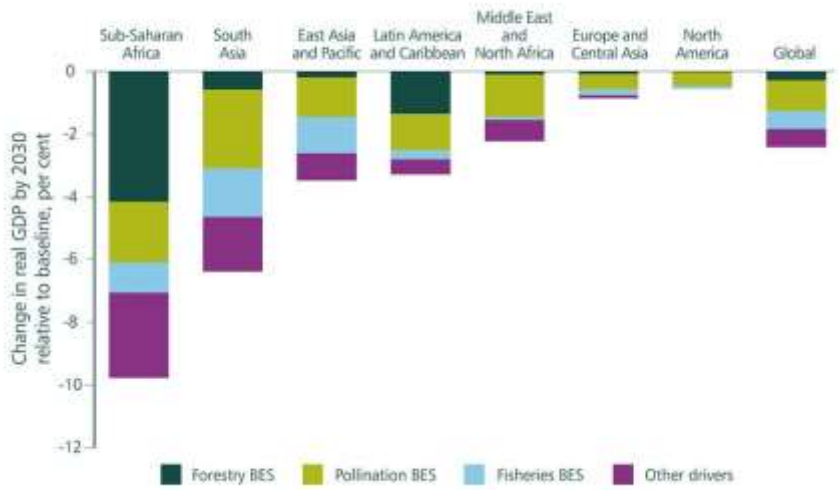
The estimate is a case of misplaced quantification. As the authors recognise, if Nature is destroyed, life would cease to exist. But then who would then be here to receive US$33 trillion of annual benefits if humanity were to exchange its very existence for them? Economics, when used with care, is meant to serve our ethical values. The language it provides helps us to choose in accordance with those values. Despite recognising this, the authors of the paper imply that the biosphere is valuable *because* it can be imputed a large monetary value. That is to get things backward.[26]

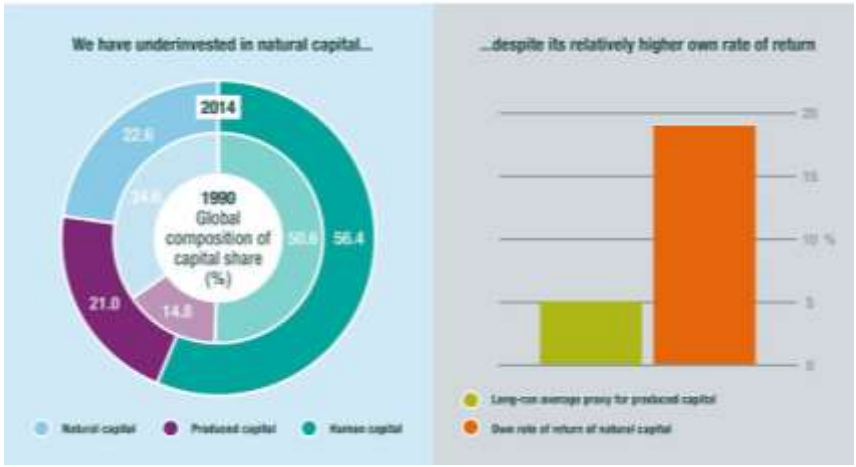
Measurement problems are also rife in estimating the *stock* of many kinds of natural capital (fisheries stocks in their national waters are generally not recorded by governments), but it is far better to work with rough and ready figures than to ignore whole swathes of capital goods by pretending they do not exist. Unfortunately, the macroeconomic theories of growth and development that have shaped our beliefs about economic possibilities and the progress and regress of nations do not recognise humanity's dependence on Nature. The *Review* corrects that mistake.[27]

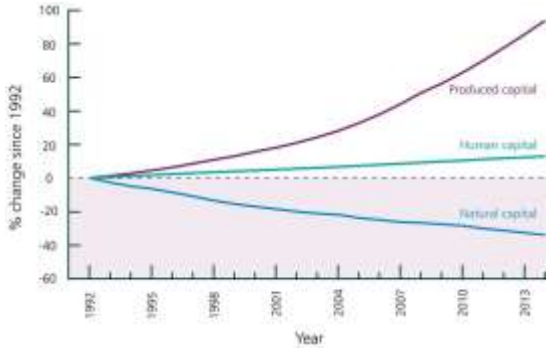
Putting this in context



https://www.gov.uk/government/publications/final-report-the-economics-of-biodiversity-the-dasgupta-review







INCLUSIVE WEALTH REPORT 2022

Executive Summary

https://wedocs.unep.org/handle/20.500.11822/40512

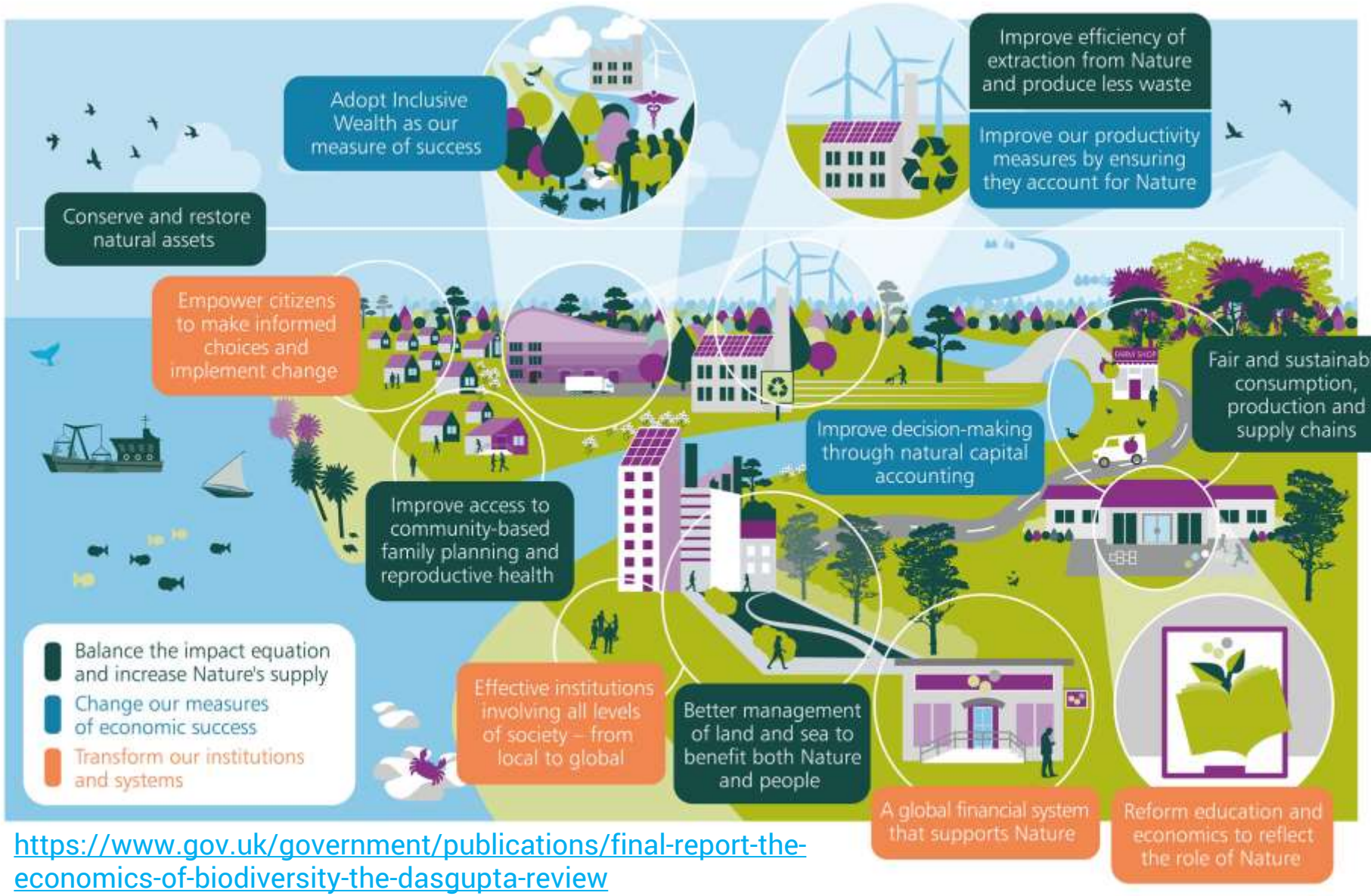
Since 1990, the baseline of all Inclusive Wealth Reports, growth in absolute inclusive wealth has been positive for most countries. This is reflected by a 49 per cent increase in total global inclusive wealth in that time period. Only eight countries out of 163 showed negative growth: Cambodia, Chile, Ecuador, Iceland, Myanmar, Peru, and Somalia. However, this seemingly positive result is tempered when world population growth is considered. The global population has increased by 2.4 billion people (from 5.3 billion to 7.7 billion) in the same period, and taking this into account, global inclusive wealth per capita has dropped by 5 per cent.

Moreover, the growth in absolute inclusive wealth has resulted in a loss of natural capital. This report shows that from 1990–2019, the world's natural capital diminished by more than 28 per cent – over 1 per cent per annum. Decreased natural capital and more people to share it amongst results in a smaller share per person. Consequently, natural capital has dropped by over 50 per cent per capita during the same time period. This decline is a key factor in the 5 per cent decrease in per capita inclusive wealth globally: natural capital decline negatively affected the growth of inclusive wealth per capita in 151 of the 163 countries analysed.

Dasgupta Review Response Options

A broader perspective in which to think about results of a National Ecosystem Assessment?

Returning to the transformational change ideas of the IPBES Values Assessment about more deeply embedding values to leverage more transformational change



https://www.gov.uk/government/publications/final-report-the-economics-of-biodiversity-the-dasgupta-review

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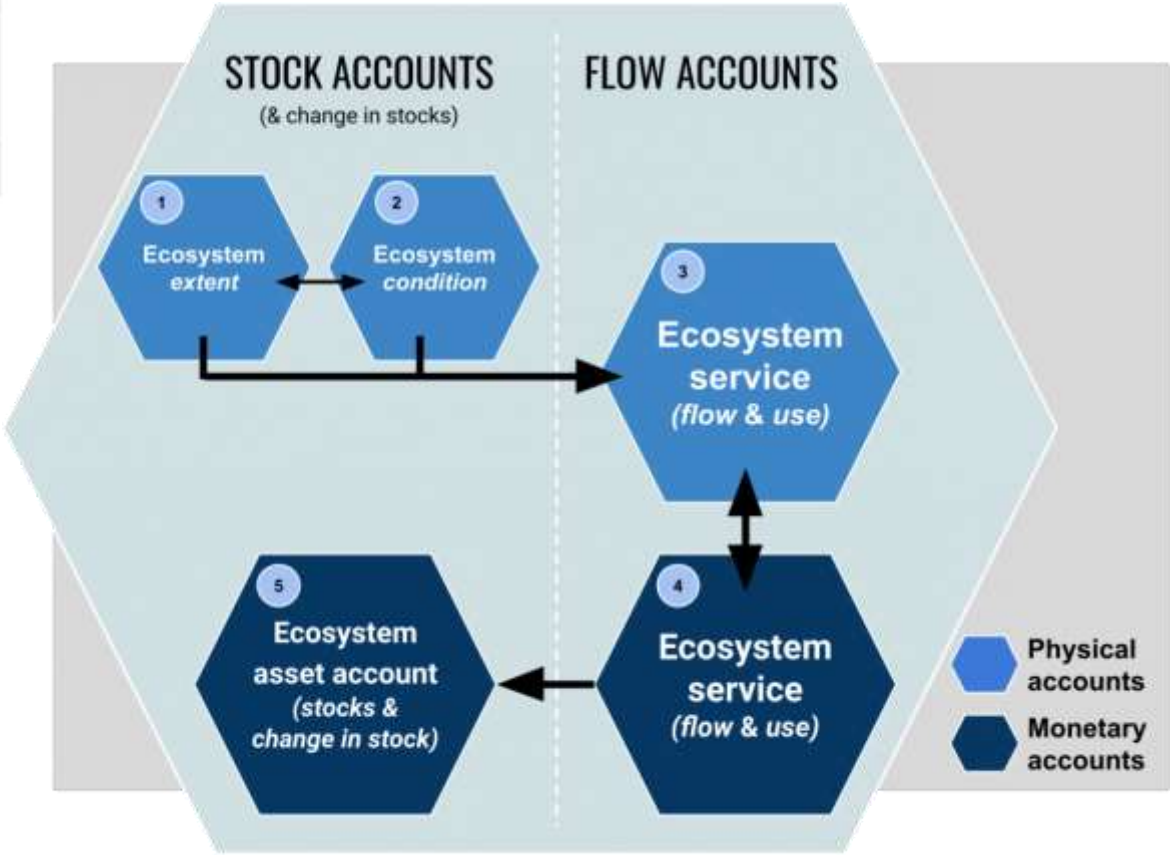
IPBES Values Assessment on Economic approaches to embed values in economic decisions

Economic approaches to embed values in economic decisions	Relevance: Ability to elicit of diverse values in multiple socio-ecological contexts		Robustness: Ability to ensure reliable (accurate and valid) and fair representation of stakeholders		Resources: Affordability and ease of use		Level of confidence
	Diverse values	Diverse contexts	Reliability	Representation	Ease of implementation	Ease of operation	
The Economics of Ecosystems and Biodiversity (TEEB)	●	●	●	●	●	●	✓
United Nations System of Environmental Economic Accounting – Ecosystem Accounting (SEEA – EA)	●	●	●	●	●	●	✓
Inclusive/comprehensive wealth approaches	●	●	●	●	●	●	~

TEEB 6 step approach

- **STEP 1:** Refine the objectives of a TEEB study by specifying and agreeing on the *key policy issues with stakeholders*
- **STEP 2:** Identify the most relevant ecosystem services
- **STEP 3:** Define information needs and select appropriate methods
- **STEP 4:** Assess and value ecosystem services
- **STEP 5:** Identify and outline the pros and cons of policy options, including distributional impacts
- **STEP 6:** Review, refine and report



Integrating economic values into the NEA: Mozambique Case Study Application

Dr. Steven King

Environmental Economist
UNEP-WCMC

Policy Entry Point

- Ecosystems services are critical to the resilience of communities, businesses and livelihoods, particularly in the face of climate change
- Mozambique's Natural Capital Programme is a key initiative of the National Green Economy Action Plan to secure these services
- Improved understanding of ecosystems and the services they deliver is critical in developing the Governments 5-yearly action plans

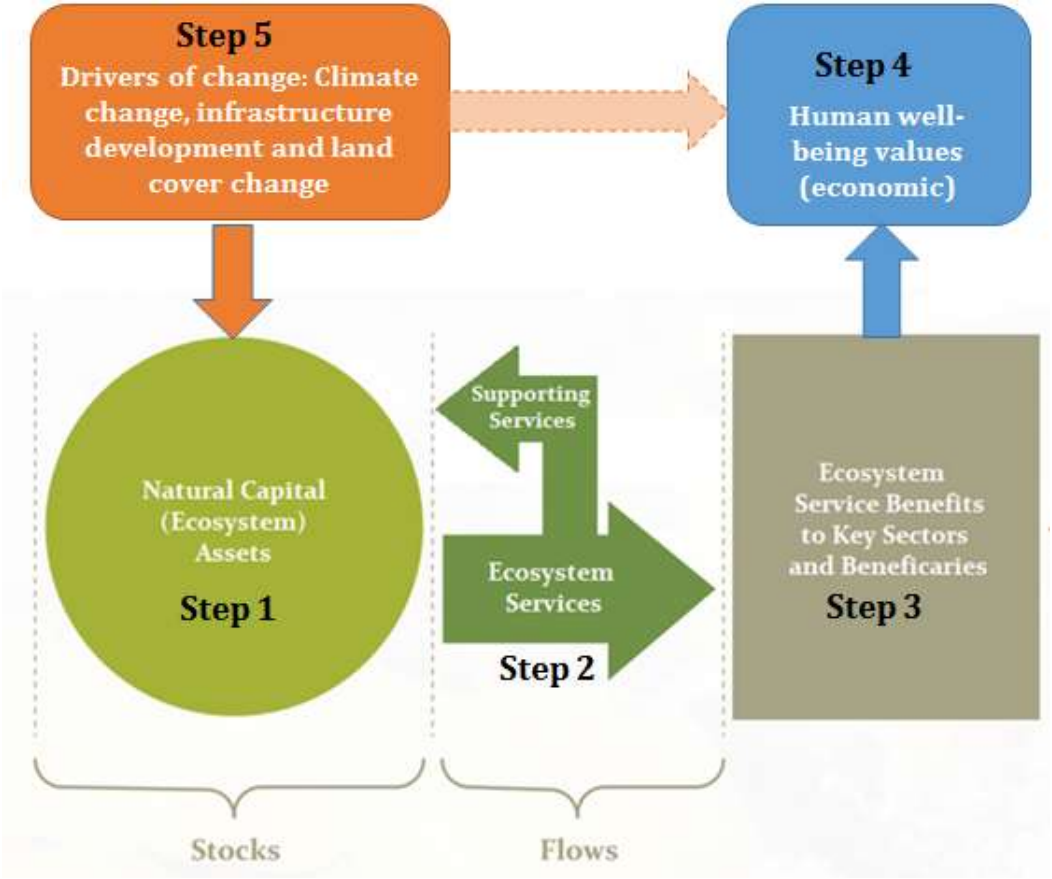
NATIONAL ECOSYSTEM ASSESSMENT INITIATIVE

Analytical objective

- As such an ecosystem assessment was undertaken to:
  1. Establish the location of key ecosystem assets across Mozambique
  2. Quantify the services provided by these ecosystems in physical and monetary terms
  3. Evaluate how these ecosystem services may change under different climate change and development scenarios

NATIONAL ECOSYSTEM ASSESSMENT INITIATIVE

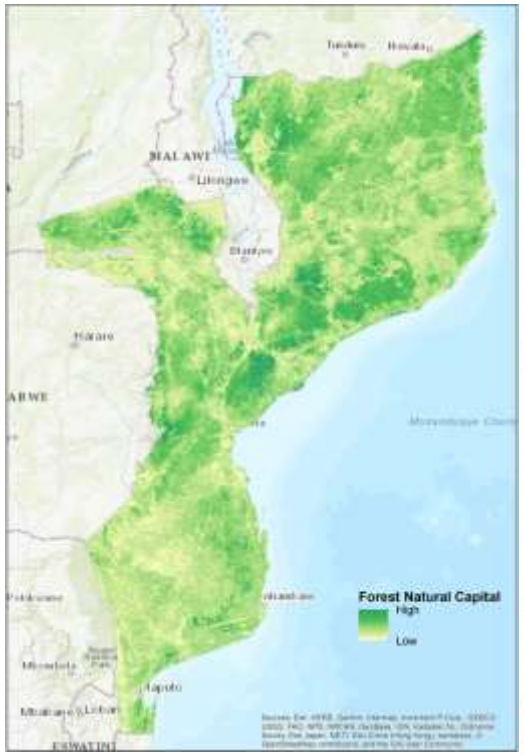
Conceptual Framework



- Step 1: Identify key ecosystem assets
- Step 2: Link ecosystems assets to ecosystem services
- Step 3: Quantify ecosystem service flows
- Step 4: Monetary valuation of ecosystem service flows
- Step 5: Scenario analysis

NATIONAL ECOSYSTEM ASSESSMENT INITIATIVE

Step 1: Key Ecosystems Assets

Forests	Mangroves	Freshwater	Coral reefs
			

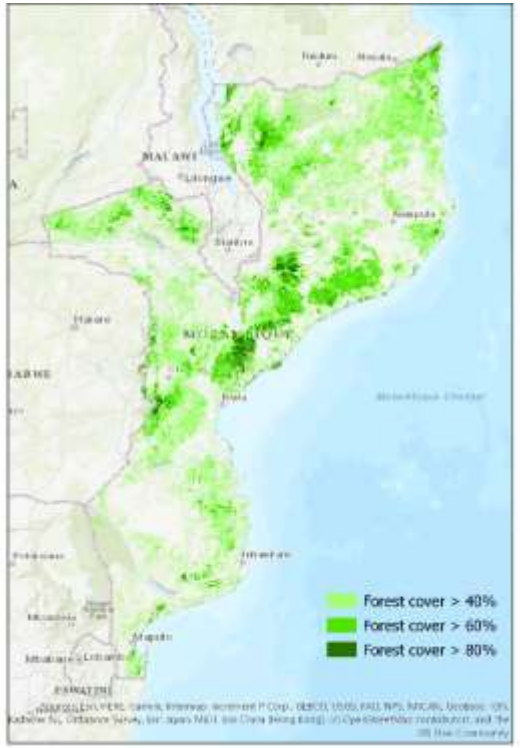
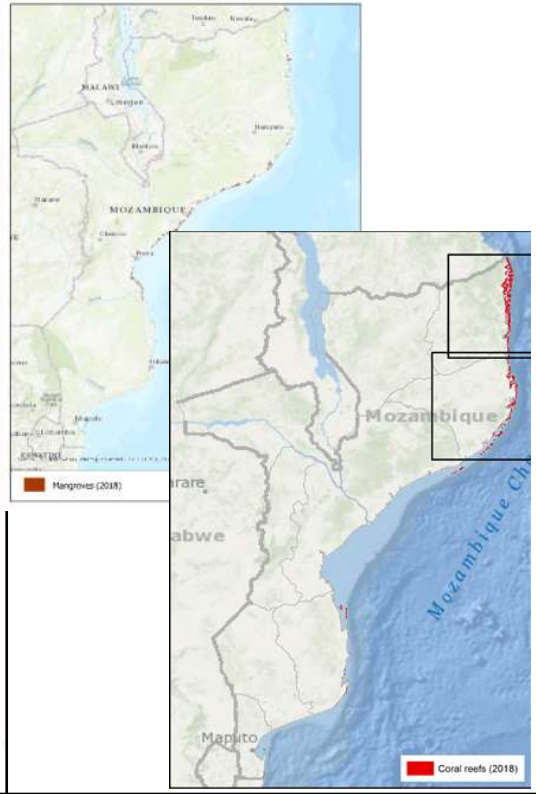
NATIONAL ECOSYSTEM ASSESSMENT INITIATIVE

Step 2: Ecosystem Services Matrix

Ecosystem Services / Ecosystem Assets	Freshwater provision	Food provision	Carbon sequestration and storage	Energy (hydropower)	Fuelwood / Construction materials	Commercial Timber	Tourism	Nursery habitat	Storm protection	Supporting services
Rivers and Lakes	X (drinking and agriculture)	X (Inland fisheries)		X						
Forests		X (NTFPs)	X	X (sediment stabilisation)	X	X	X			
Coral reef							X	X	X	
Mangroves		X (NTFPS – Oysters / Crabs)	X		X		X	X	X	
Seagrass			X					X	X	
Biodiversity							X			Proxy
Cropland (Soil suitability)		X								
Marine (fish stocks)		X								

NATIONAL ECOSYSTEM ASSESSMENT INITIATIVE

Step 3 and 4: Forests Example

Step 3: Sustainable timber harvesting	Step 3: Sustainable wood fuel	Step 3: Coastal storm protection	Step 3: Inland fisheries production
			
Step 4: US 71 Million / yr	Step 4:US 24 Million / yr	Step 4:US 2.4 Million / yr	Step 4: US 62 Million / yr

NATIONAL ECOSYSTEM ASSESSMENT INITIATIVE

Step 3 and 4: Aggregate Analysis

Ecosystem Service	**Total production**	**Value (Millions USD/yr)**
Inland waters fish provisioning service	34,348 (tonnes fish / yr)	68.71
Timber provisioning services	648,790 (m3 timber / yr)	71.37
Wood fuel provisioning services	1,672,400 (m3 / yr)	24.38
Crop provisioning services	5,259,546 tonnes crops / year	651.52
Storm protection service	N/A	2.42
Marine fish nursery and provisioning service (Mangroves, coral reefs and seagrass)	36,723 tonnes fish / year	73.45
Marine fish provisioning (Other ecosystems)	~140,000 tonnes / year	194.55
Nature Based Tourism	-	28.75
Total	**N/A**	**1,115.15**
Global climate regulation (carbon storage)	~5 Billion tonnes CO_2e	>100 Billion (Total social costs)

NATIONAL ECOSYSTEM ASSESSMENT INITIATIVE

Step 5: Scenario Analysis

Current deforestation trends to 2050 will:

- Reduce hydropower efficiency due to sedimentation
- Reduce sustainable wood fuel supply
- Increase climate change (Social costs = US 23 billion)

Projected climate change by 2050 will:

- Reduce crop provisioning services (- US Million 31.5/yr)
- Impact on coral reef, seagrass and mangrove ecosystems services related to storm protection and fish provisioning
- Increase flood risk in the north of the country (ecosystem service can help adapt to this)

- Further economic analysis of these marginal changes can make the economic case for addressing deforestation and investing in ecosystem based adaptation.

NATIONAL ECOSYSTEM ASSESSMENT INITIATIVE