

# Green Skills

## Values, Sustainability, Economics of Biodiversity

*Riitta Dersten*

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# Who am I

*Riitta Dersten, Msc. Engineering, Bs. Engineering,  
vocational teacher, field ecologist student,  
treehugger, beekeeper.*

*Motto: To build sustainable economy we need to  
understand possibilities and limitations of ecology*



# Who are You?

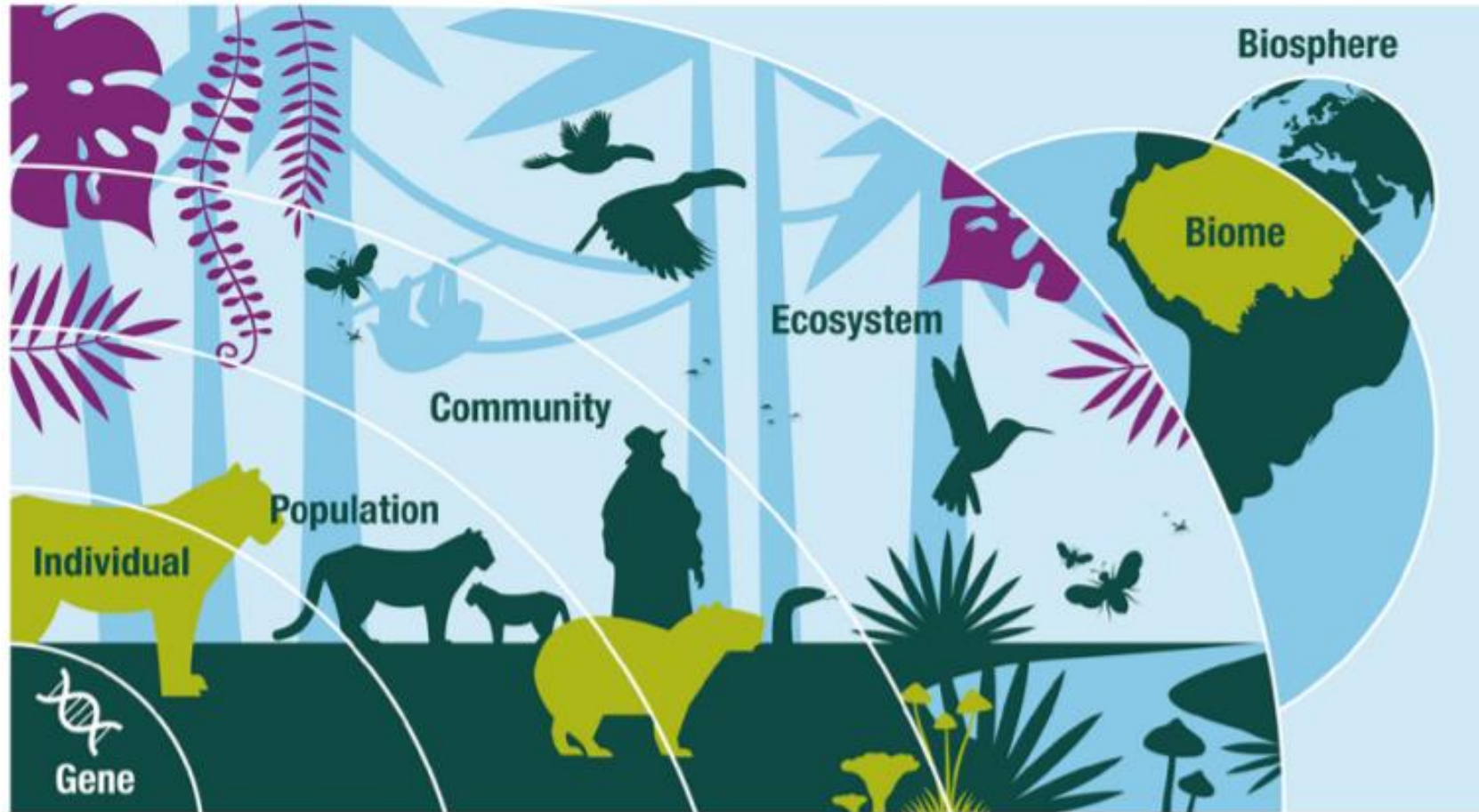
*Where You are from?  
What's your "motto"?*

*Please, introduce yourself in Chat.*



**Our economies,  
livelihoods and well-  
being all depend on our  
most precious asset:  
Nature**

# From the Micro to the Macro



# Our economies, livelihoods and well-being all depend on our most precious asset: Nature.

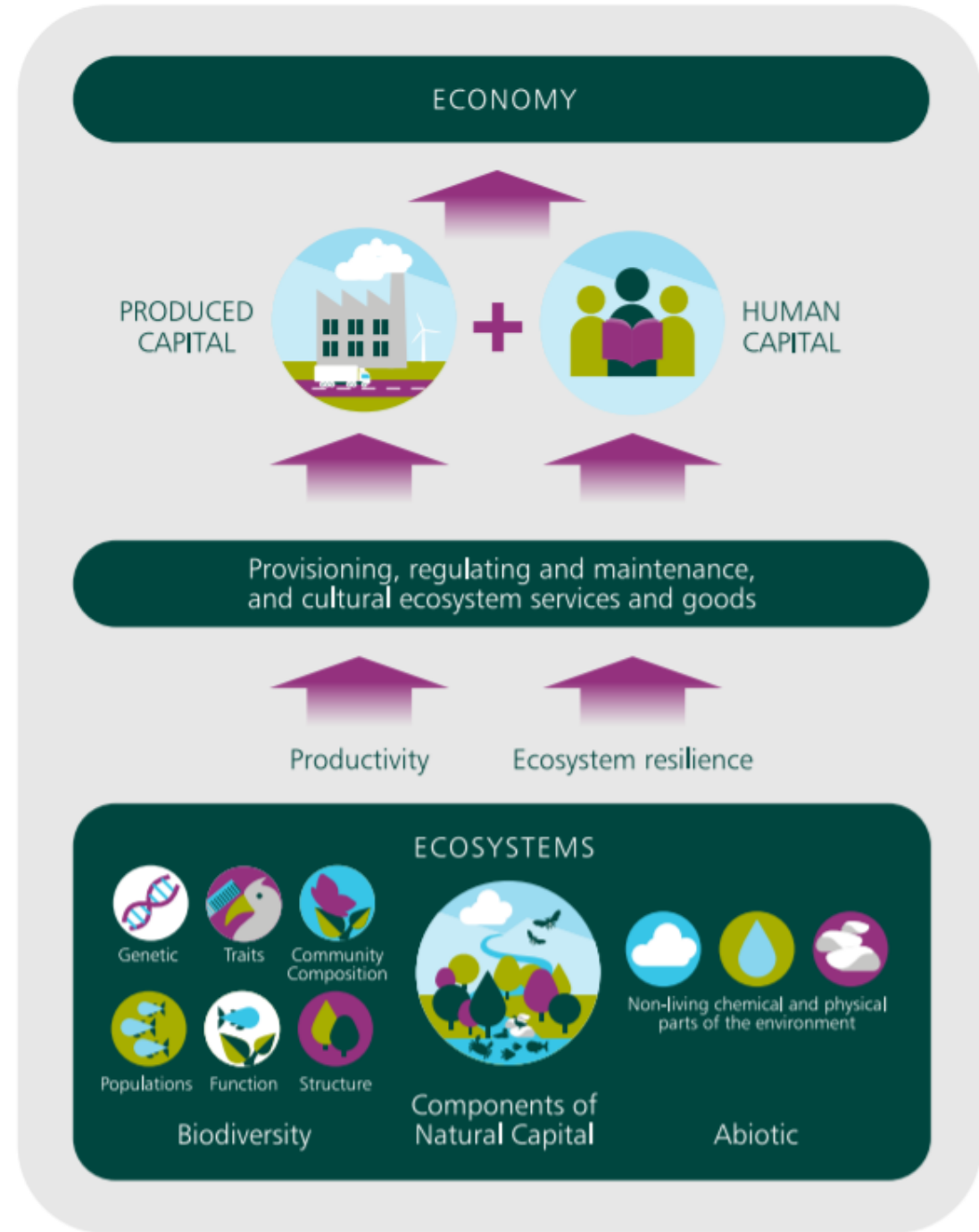
Nature provide us with food, water and shelter; regulate our climate and disease; maintain nutrient cycles and oxygen production; and provide us with spiritual fulfilment and opportunities for recreation and recuperation and enhance our health and well-being.

We also use the planet as a sink for our waste products, such as carbon dioxide, plastics and other forms of waste, including pollution.

Nature is therefore an asset, just as produced capital and human capital are assets.

Biodiversity enables Nature to be productive, resilient and adaptable, and when we reduce biodiversity, and Nature and humanity suffer.

# Links From Biodiversity to the Economy



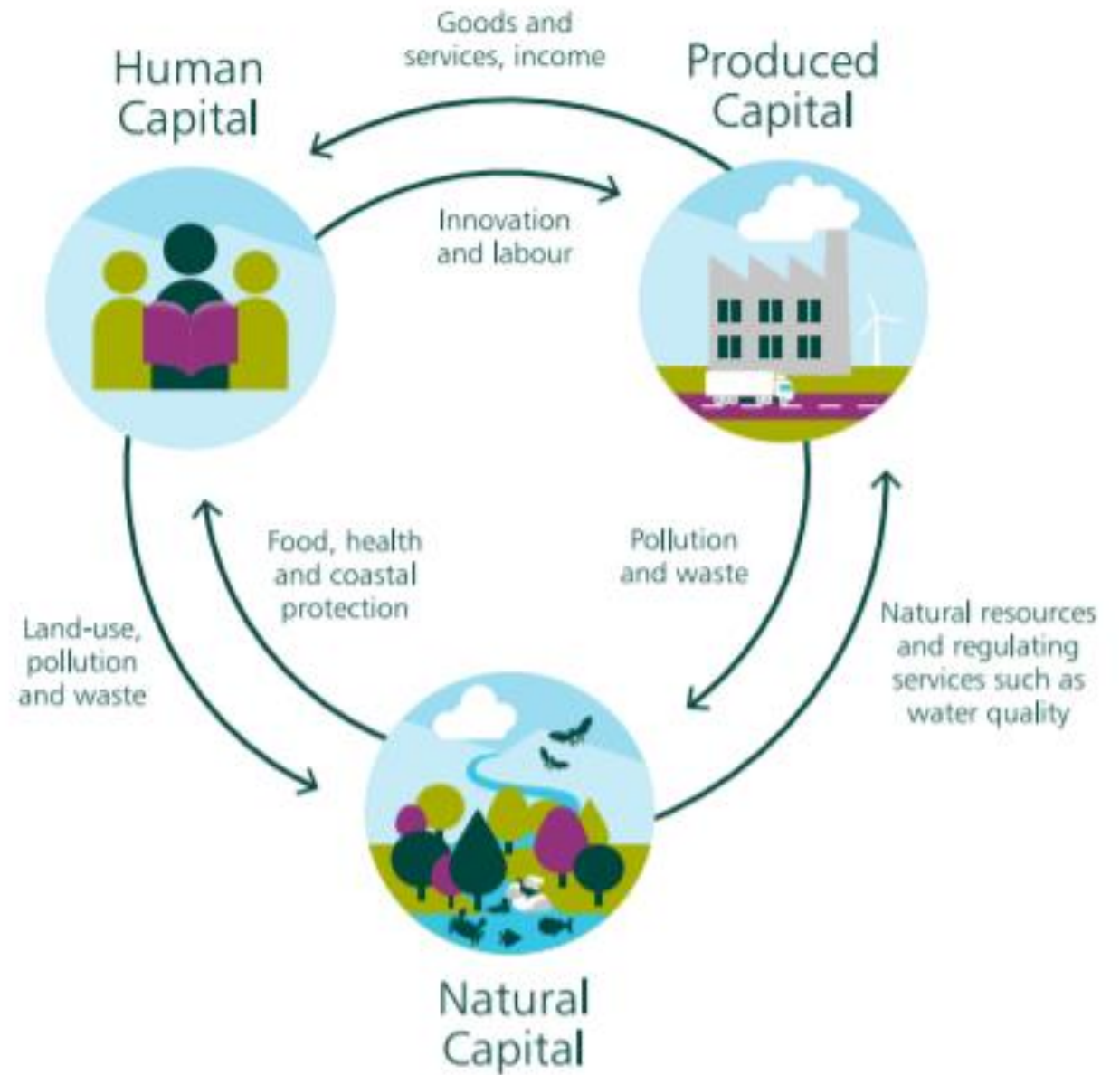


# Three Classes of Capital Goods





# Interaction Between the Capitals



# We have failed to engage with Nature sustainably, to the extent that our demands far exceed its capacity to supply us with the goods and services.

We are all asset managers.

- Individuals, businesses, governments and international organisations all manage assets through our spending and investment decisions.

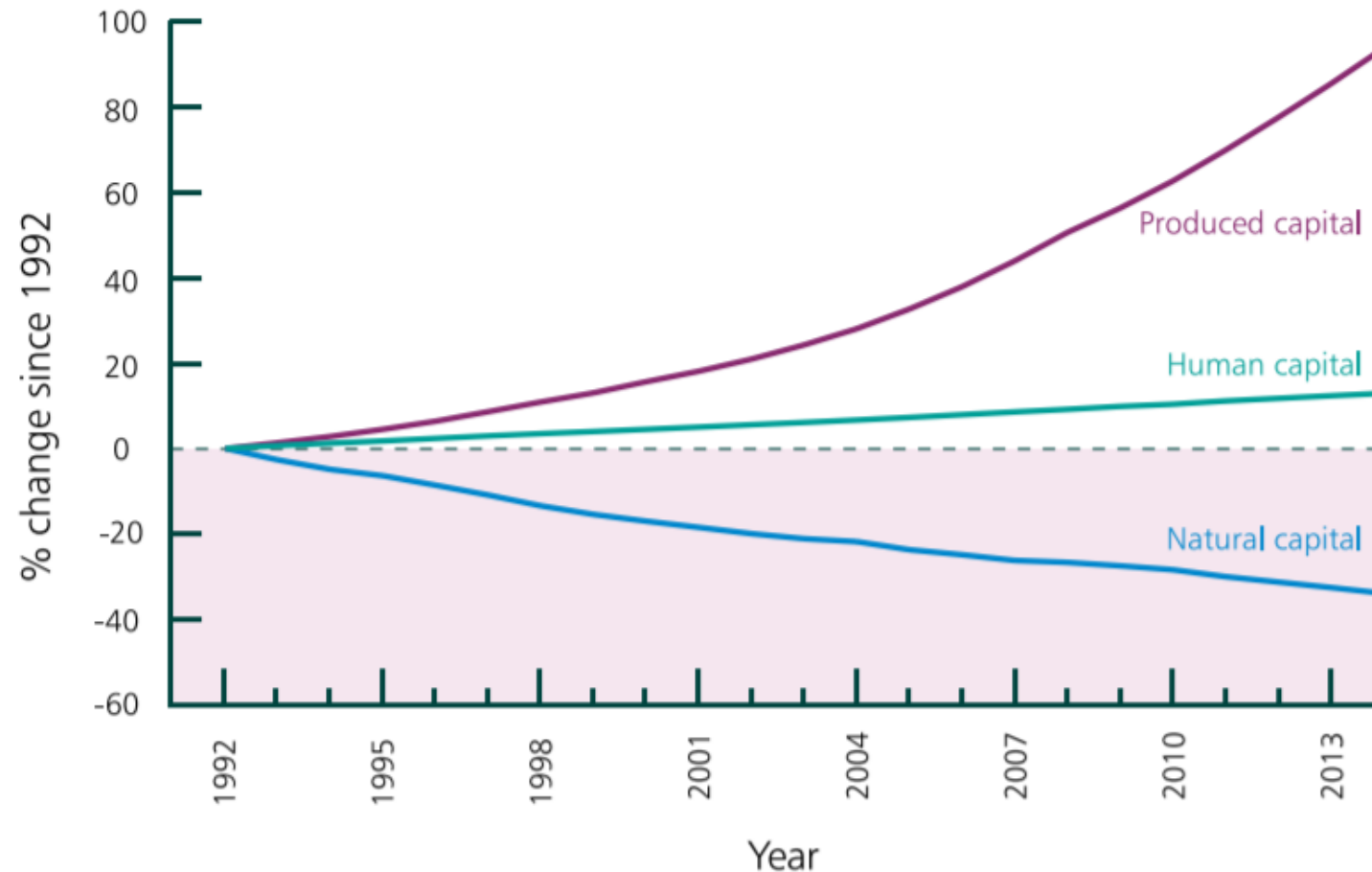
Unfortunately, we have failed to manage our global portfolio of assets sustainably.

- Estimates show that between 1992 and 2014, produced capital per person doubled, and human capital per person increased by about 13% globally; but the stock of natural capital per person declined by nearly 40%.

While humanity has prospered immensely in recent decades, the ways in which we have achieved such prosperity means that it has come at a devastating cost to Nature.

- Estimates of our total impact on Nature suggest that we would require 1.6 Earths to maintain the world's current living standards. If everyone would consume as Finns, we would need 3,6 Earths.

# Global Wealth Per Capita, 1992 to 2014



Source: Managi and Kumar (2018).

# Our unsustainable engagement with Nature is endangering the prosperity of current and future generations.

Biodiversity is declining faster than at any time in human history.

- Current extinction rates, for example, are around 100 to 1,000 times higher than the baseline rate, and they are increasing.

Such declines are undermining Nature's productivity, resilience and adaptability, and are in turn fuelling extreme risk and uncertainty for our economies and well-being.

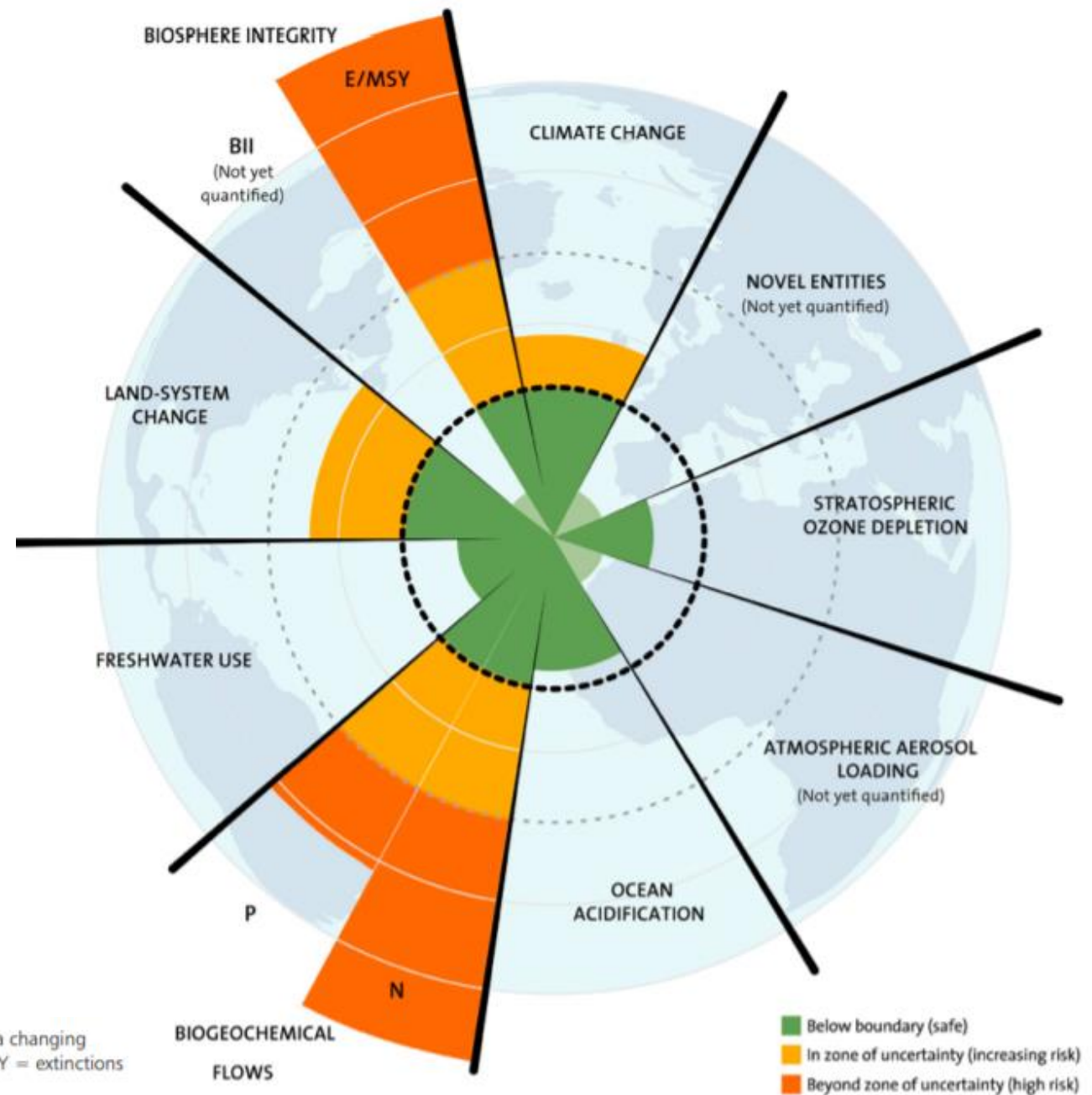
- Many ecosystems, from tropical forests to coral reefs, have already been degraded beyond repair, or are at imminent risk of 'tipping points'.

These tipping points could have catastrophic consequences for our economies and well-being; and it is costly and difficult, if not impossible, to coax an ecosystem back to health once it has tipped into a new state.

Reversing these trends requires action now.

- To do so would be significantly less costly than delay, and would help us to achieve wider societal goals, including addressing climate change (itself a major driver of biodiversity loss) and alleviating poverty.

# Critical Earth System Processes and Their Boundaries



Source: J. Lokrantz/Azote based on Steffen, W. et al. (2015) 'Planetary boundaries: Guiding human development on a changing planet', Science, 347(6223:1–10). Note: P = phosphorus; N = nitrogen; BII = Biodiversity Intactness Index and E/MSY = extinctions per million species per year.

# At the heart of the problem lies deep-rooted, widespread institutional failure.

Nature's worth to society – the true value of the various goods and services it provides – is not reflected in market prices because much of it is open to all at no monetary charge.

These pricing distortions have led us to invest relatively more in other assets, such as produced capital, and underinvest in our natural assets.

Moreover, aspects of Nature are **mobile**; some are **invisible**; and many are **silent**.

These features mean that the effects of many of our actions on ourselves and others – including our descendants – are hard to trace and go unaccounted for, giving rise to widespread 'externalities' and making it hard for markets to function well.

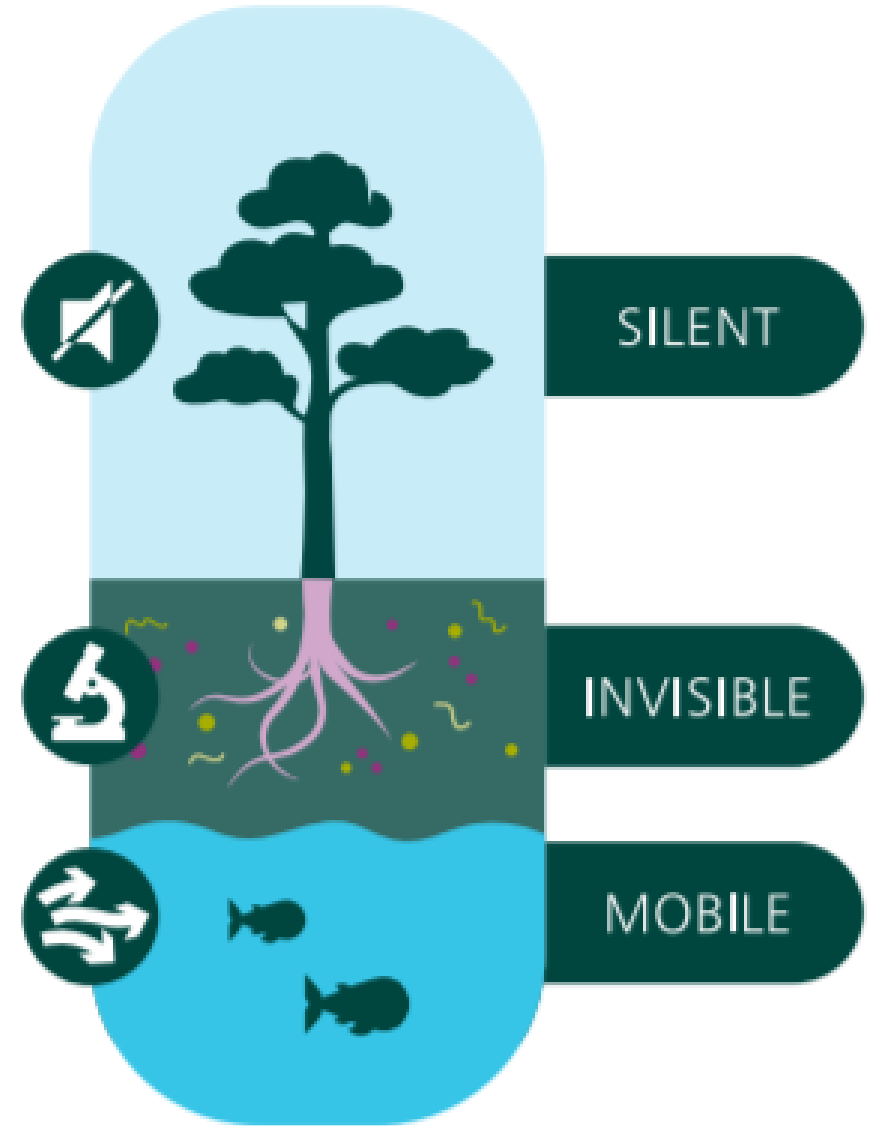
- But this is not simply a market failure: it is a broader institutional failure too. Many of our institutions have proved unfit to manage the externalities.

Governments almost everywhere exacerbate the problem by paying people more to exploit Nature than to protect it, and to prioritise unsustainable economic activities.

- A conservative estimate of the total cost globally of subsidies that damage Nature is around US\$4 to 6 trillion per year.

The 15th Conference of the Parties to the **Convention on Biological Diversity** (COP15) and the 26th Conference of the Parties to the UN **Framework Convention on Climate Change** (COP26) provide important opportunities to set a new, ambitious direction for the coming decade.

Nature – mobility, invisibility and silence – are of profound significance to the economics of biodiversity





# The solution starts with understanding and accepting a simple truth: our economies are embedded within Nature, not external to it.

While most models of economic growth and development recognise that Nature is capable only of producing a finite flow of goods and services, the focus has been to show that *technological progress* can, in principle, overcome that exhaustibility.

This is to imagine that, ultimately, humanity is ‘external’ to Nature.

But we – and our economies – are ‘embedded’ within Nature, not external to it.

This approach helps us to understand that the human economy is bounded and reshapes our understanding of what constitutes truly sustainable economic growth and development:

- accounting fully for the impact of our interactions with Nature and rebalancing our demand with Nature’s capacity to supply.

# The Economy is Embedded in the Biosphere



**Go to**  
**[www.menti.com](https://www.menti.com)**  
**and use the code**  
**46 36 70 5**



# How You personally utilize Nature? What kind of asset it is for You?



# How your organisation or your field of industry utilises Nature? What kind of asset Nature is for it?



# We need to change how we think, act and measure success

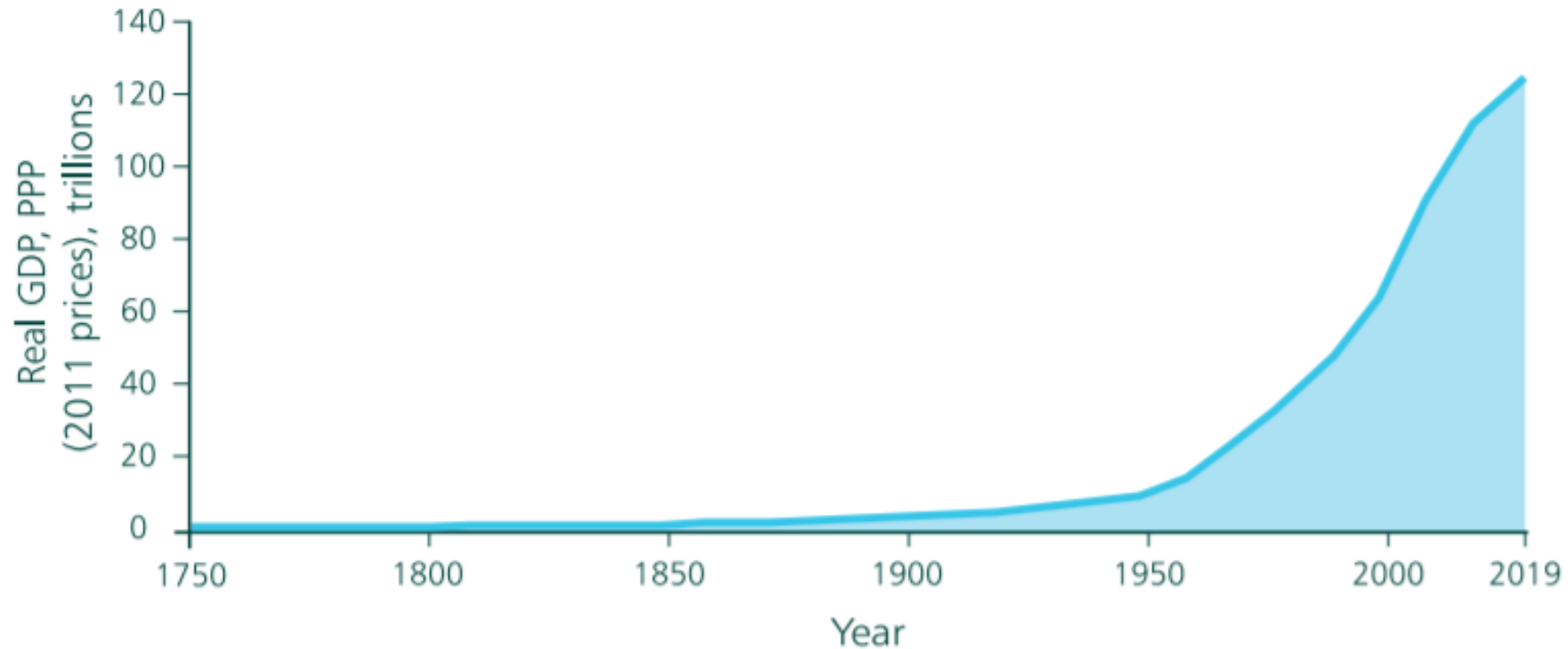
Humanity faces an urgent choice.

Sustainable economic growth and development requires us to take a different path, where our engagements with Nature are not only sustainable, but also enhance our collective wealth and well-being and that of our descendants.

Choosing a sustainable path will require transformative change, underpinned by levels of ambition, coordination and political will.

The change required should be geared towards three broad transitions.

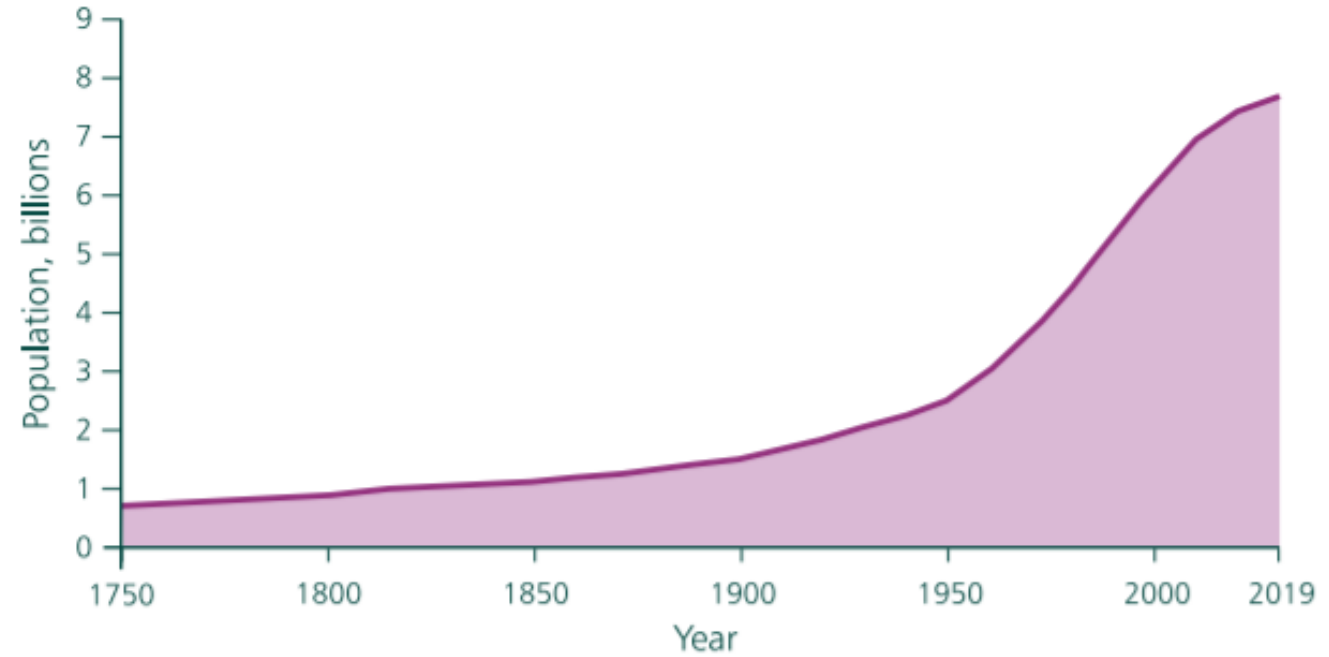
# Global Real GDP Since 1750



Source: Our World in Data based on World Bank (2020a), Maddison (2018), Bolt et al. (2018) and Review calculations.

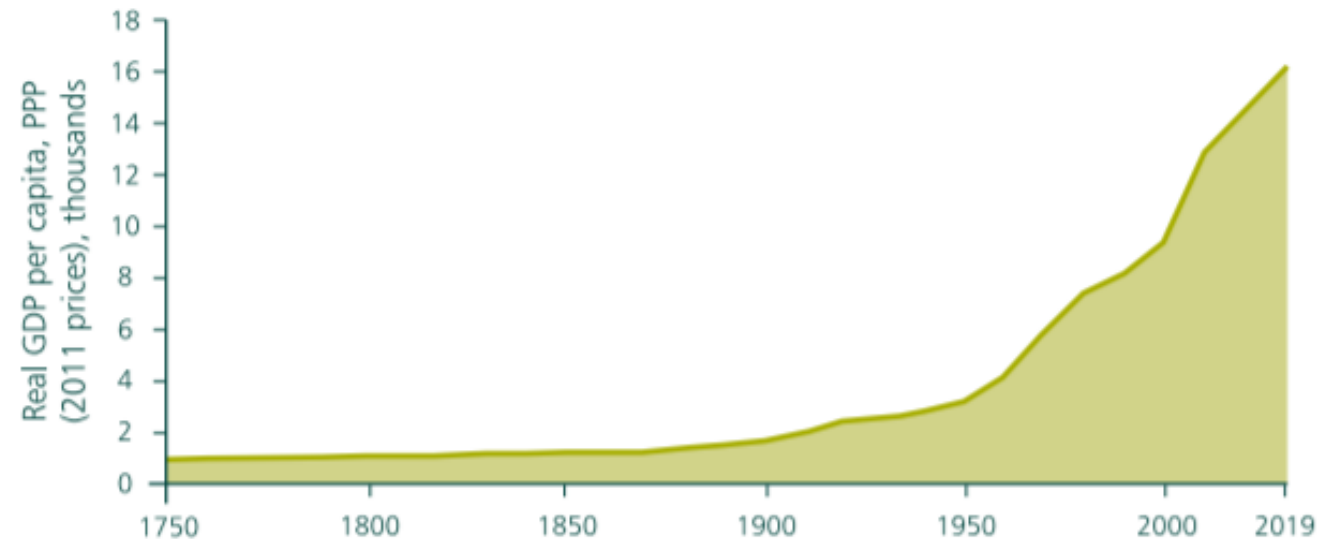


# Global Population Since 1750



Source: Maddison (2010), UNPD (2019) and Review calculations.

# Global Real GDP Per Capita Since 1750



# (1) Ensure that our demands on Nature do not exceed its supply, and that we increase Nature's supply relative to its current level.

**Food production** is the most significant driver of terrestrial biodiversity loss.

- As the global population grows, the enormous problem of producing sufficient food in a sustainable manner will only intensify.
- Sustainable food production systems can decrease the sector's contribution to climate change, land-use change and ocean degradation; reduce environmentally damaging inputs and waste; improve production system resilience, through methods such as precision agriculture, integrated pest management and molecular breeding techniques; and are likely to have a positive economic impact, including the creation of jobs.

**Demand for energy** is a major contributor to climate change and resulting biodiversity loss.

- Decarbonising our energy systems is a necessary part of balancing demand and supply.

We cannot rely on **technology** alone: consumption and production will need to be fundamentally restructured.

- That can be done by change prices and behavioural norms, for example enforcing standards for *re-use, recycling and sharing* (**Circular economy**), and aligning environmental objectives along entire global supply chains.

# (1) Ensure that our demands on Nature do not exceed its supply, and that we increase Nature's supply relative to its current level.

**Growing human populations** have significant implications for our demands on Nature, including for future patterns of global consumption.

- As well as improving *women's access to finance, information and education*, support for community-based *family planning* programmes can shift preferences and behaviour and accelerate the demographic transition.

**Conserving and restoring our natural assets** will sustain and enhance their supply.

- It is less costly to conserve Nature than to restore it once damaged or degraded, all else being equal.

**Expanding and improving the management of Protected Areas** therefore has an essential role to play.

**Multi-functional landscapes and seascapes** that provide ecosystem goods and services, and protect and enhance biodiversity, are also important.

**Large-scale and widespread investment in Nature-based Solutions** would help us to address biodiversity loss and significantly contribute to climate change mitigation and adaptation, not to mention wider economic benefits, including creating jobs.

*As part of fiscal stimulus packages in the wake of COVID-19, investment in natural capital has the potential for quick returns.*

## (2) Change our measures of economic success to guide us on a more sustainable path.

Nature needs to enter economic and finance decision-making in the same way buildings, machines, roads and skills do.

- To do so ultimately requires changing our measures of economic success.

**Gross Domestic Product (GDP)** is needed for short-run macroeconomic analysis and management, but GDP does not account for the depreciation of assets, including the natural environment.

- As our primary measure of economic success, it therefore encourages us to pursue unsustainable economic growth and development.

In order to judge whether economic development is sustainable, **an inclusive measure of wealth is needed.**

- By measuring our wealth in terms of all assets, including natural assets, 'inclusive wealth' provides a clear and coherent measure that corresponds directly with the well-being of current and future generations.

### (3) Transform our institutions and systems – in particular finance and education systems – to enable these changes and sustain them for future generations.

**Information** required for managing ecosystems is asymmetrically distributed:

- much is uniquely understood and best managed by **local communities**, but important perspectives are also held among **national governments, international organisations and along global supply chains**.

They pool knowledge and perspectives among and across different levels – **global, regional, national and local** – and from **different organisations, communities and individuals**.

- In doing so, they enable relevant information to flow, and allow for **collaborative planning, participation and coordination**.

Ecosystems that are global public goods raise problems, the solutions for which transcend national seats of governance.

- There is a need for supra-national institutional arrangements. There are two broad classes of cases to consider.
  1. For those ecosystems that are located within national boundaries (for example, tropical rainforests), a system of **payments** to nations for protecting the ecosystems on which we all rely should be explored.
  2. For ecosystems that lie outside national boundaries (for example, the oceans beyond exclusive economic zones), imposing **charges, or rents**, for their use (for example, ocean traffic and ocean fisheries) and prohibiting their use in ecologically sensitive areas should be instituted.

### (3) Transform our institutions and systems – in particular our finance and education systems – to enable these changes and sustain them for future generations.

Enabling the changes, we need will also require collective and sustained action to transform the systems that underpin our engagements with Nature, above all our **financial and education systems**.

Our **global financial system is critical** to supporting a more sustainable engagement with Nature.

Financial flows devoted to enhancing our natural assets are small and are dwarfed by subsidies and other financial flows that harm these assets.

We need a financial system that channels financial investments – **public and private** – towards economic activities that enhance our stock of natural assets and encourage sustainable consumption and production activities.

Governments, central banks, international financial institutions and private financial institutions all have a role to play.

- Not only of climate-related financial risks management but Nature related financial risks management too.

### (3) Transform our institutions and systems – in particular finance and education systems – to enable these changes and sustain them for future generations.

However, relying on institutions alone will not be enough.

The discipline to draw on Nature sustainably must, ultimately, be provided by us as **individuals**.

- But societal change – particularly **growing urbanisation** – has meant that many people have grown distant from Nature.

Interventions to enable people to understand and connect with Nature would not only improve our health and well-being, but also help empower citizens to make informed choices and **demand the change that is needed**;

- for example, *by insisting that financiers invest our money sustainably and that firms disclose environmental conditions along their supply chains, and even boycotting products that do not meet certain standards.*

**Establishing the natural world in education policy** is therefore essential.

- The development and design of **environmental education programmes** can help to achieve tangible impact, for example by focusing on local issues, and collaborating with scientists and community organisations



# Transformative change is possible – we and our descendants deserve nothing less.

At their core, the problems we face today are no different from those our ancestors faced:

- how to find a balance between what humanity takes from Nature and what we leave behind for our descendants.

*While our ancestors were incapable of affecting the Earth system as a whole, we are doing just that.*

Since we look to others when acting, the necessary changes are not only possible, but are likely to be less costly and less difficult than often imagined.

The success stories from around the world show us what is possible.

They also demonstrate that the same ingenuity that has led us to make demands on Nature that are so large, so damaging and over such a short period, can be redeployed to bring about transformative change.

***We and our descendants deserve nothing less.***

# Summary of Options for Change





# Finnish Environmental Centre

The latest research shows that Finland's biodiversity continues to degrade: 12% of species and 48% of habitat types are threatened.<sup>1, 2</sup> Biodiversity loss is a global phenomenon, much like climate change, threatening the conditions for life globally. However, it is possible to use ecosystems and natural resources sustainably and thereby safeguard human well-being. We need targeted solutions to support the fight against biodiversity loss and climate change.



<https://helda.helsinki.fi/bitstream/handle/10138/300600/PB-Biodiversity-net.pdf?sequence=1&isAllowed=y>

# Biodiversity revived

## Network of protected areas, representative and well-connected

- Forest conservation increased in Southern Finland
- Metso Programme extended to mires
- Targeted increase of marine protection areas

## Natural functions of degraded ecosystems restored

- Mire restoration increased
- Streams and rivers restored in Southern Finland
- Restoration burning of forests increased
- More natural flood control

## Biodiversity in the areas in commercial use recovered

- Habitat data in efficient use in spatial planning
- More old trees and dead wood in forests
- Controlled burning in nutrient-poor forests
- Continuous cover forestry in peatland forests
- Improved reindeer grazing cycle
- Flowering plants for pollinators in agricultural areas
- Greenspaces managed more naturally

## Habitat management adequate and effective

- Area of seminatural grasslands doubled
- Overgrown beaches opened
- Bird wetlands restored
- Invasive alien species combatted

## Status of the Baltic Sea and inland waters improved

- Nonpoint source pollution curbed
- Nutrients circulated
- Water protection to the level of catchment areas
- Small water bodies and shores included in river basin management
- Fish migration barriers removed

# Professor Sir Partha Dasgupta, Final Report - The Economics of Biodiversity: The Dasgupta Review, Feb 2021.

Full Report

Headline Messages

Event video



# Thank you!

Questions and comments?



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