Urban Productive Ecosystems

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Aurovile Green Practices
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Urban ecosystems

- Cities play a key role for biodiversity conservation, restoration and community education.
- experiencing rapid growth with increased stress on natural resources.
- Grave challenge in sustaining life.

We depend on nature for our well-being

Provisioning services

- Food, fibre and fuel
- Water provision
- Genetic resources

Regulating Services

- Climate /climate change regulation
- Water and waste purification
- Air purification
- Erosion control
- Natural hazards mitigation
- Pollination
- Biological control

Cultural Services

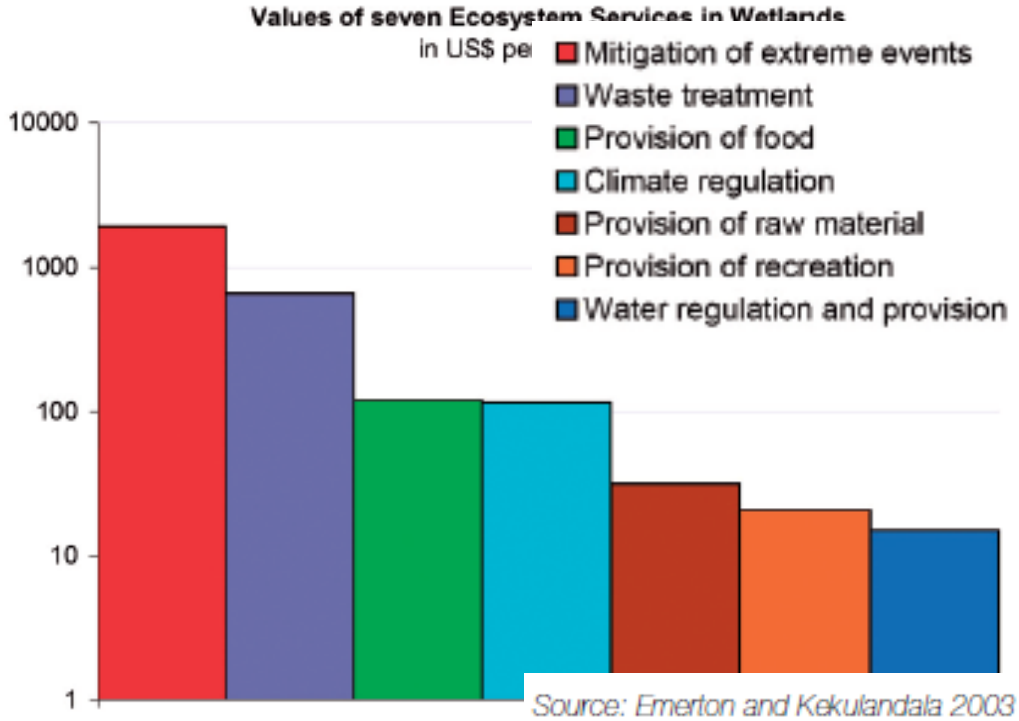
- Aesthetics, Landscape value, recreation and tourism
- Cultural values and inspirational services

Supporting Services

- *Soil formation*

+ *Resilience* - *eg to climate change*

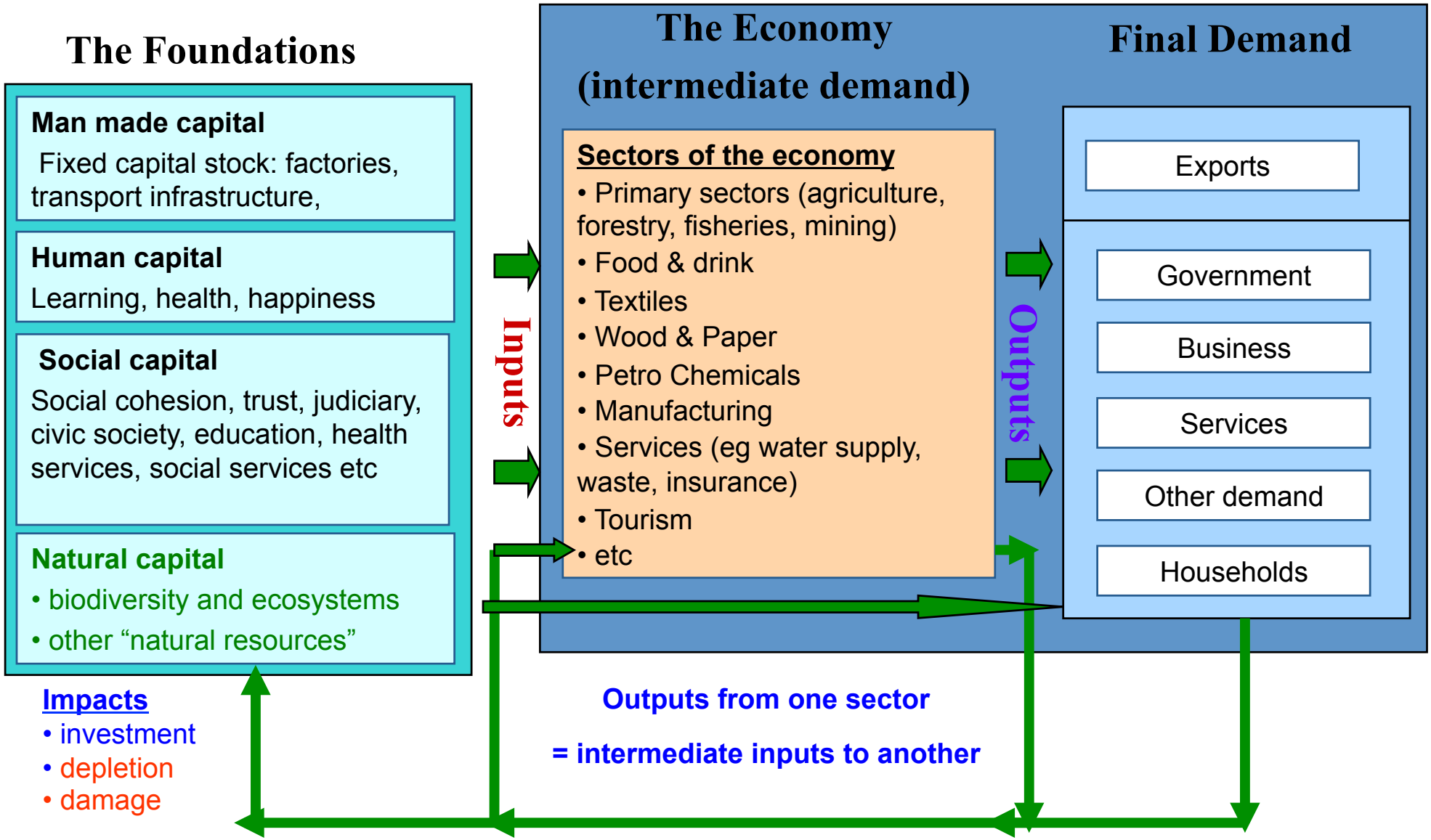
Many services from the same resource



Important to appreciate the whole set of ecosystem services.

Current lack of awareness, though this is changing

Natural capital is a foundation of the economy and wellbeing – often outside of the market



The (missing) values of biodiversity and ecosystems to the economy

Market signals do not fully take into account the value of ecosystems & biodiversity

- **Climate regulation:** carbon stored in trees, soils, wetlands;
- **Natural hazard management** and **adaptation** to climate change

They often do not reflect the damage to ecosystems/biodiversity, losses of services:

- **Land conversion** (tropical forests to palm oil based biofuels),
- **Degradation costs** (eg water pollution, soil degradation)

They rarely offer appropriate incentives for the sustainable use of natural resources

- **Forest products** (timber et al), agricultural products
- **Water use** (re groundwater depletion), soil mining and erosion

Without prices to reflect value (or damage) & without other mechanisms to take value (damage) into account, it is no surprise that we have a socially inequitable and economically inefficient use of ecosystems and their biological resources.

Critical issues

Policy makers do not have all the right tools and (economic) framework

- **National accounts** do not integrate natural capital, its depreciation (or appreciation), or its value
- **GDP and other macro-indicators** do not give the right signals as regards maintaining natural capital
- **The physical evidence base –** on **biodiversity indicators**, on **baseline changes** (eg forest cover), on **ecosystem service indicators** and – is not enough for **true "knowledge based policies"**
- *..as before*.. the value of ecosystems and biodiversity not fully reflected **in assessments** (eg IA), nor fully in EIAs, SEA etc.

Non recognition of benefits provided by Ecosystem compounds to the problem

- Development strategies focus on economic growth
- Services that nature provides are often not visible
- Competing demands on nature.
- Time lags.
- Poor understanding of natural cause and effect.
- Public versus private benefits.
- Fragmented decision making

Importance/Value (and costs) of maintaining natural capital

Value of services often taken for granted:

- Water supply/regulation: Catskills Mountains $2bn natural capital solution vs $7bn technological solution (pre-treatment plant)
- Pollination: 30% of 1,500 crop plant species depend on bee and other insect pollination. Value of bees for pollination ~ Eur29 billion to EUR 70 billion worldwide per annum.
- Fish stock existence/productivity: Global market $80bn, 1.2 billion people reliant, stock collapses have major (local/national) implications

Importance/Value (and costs) of maintaining natural capital

Value of services: existing, growing and new markets

Existing markets :pharmaceuticals : ~ US$640 billion a year, of which around 25 to 50 percent is derived from genetic resources.

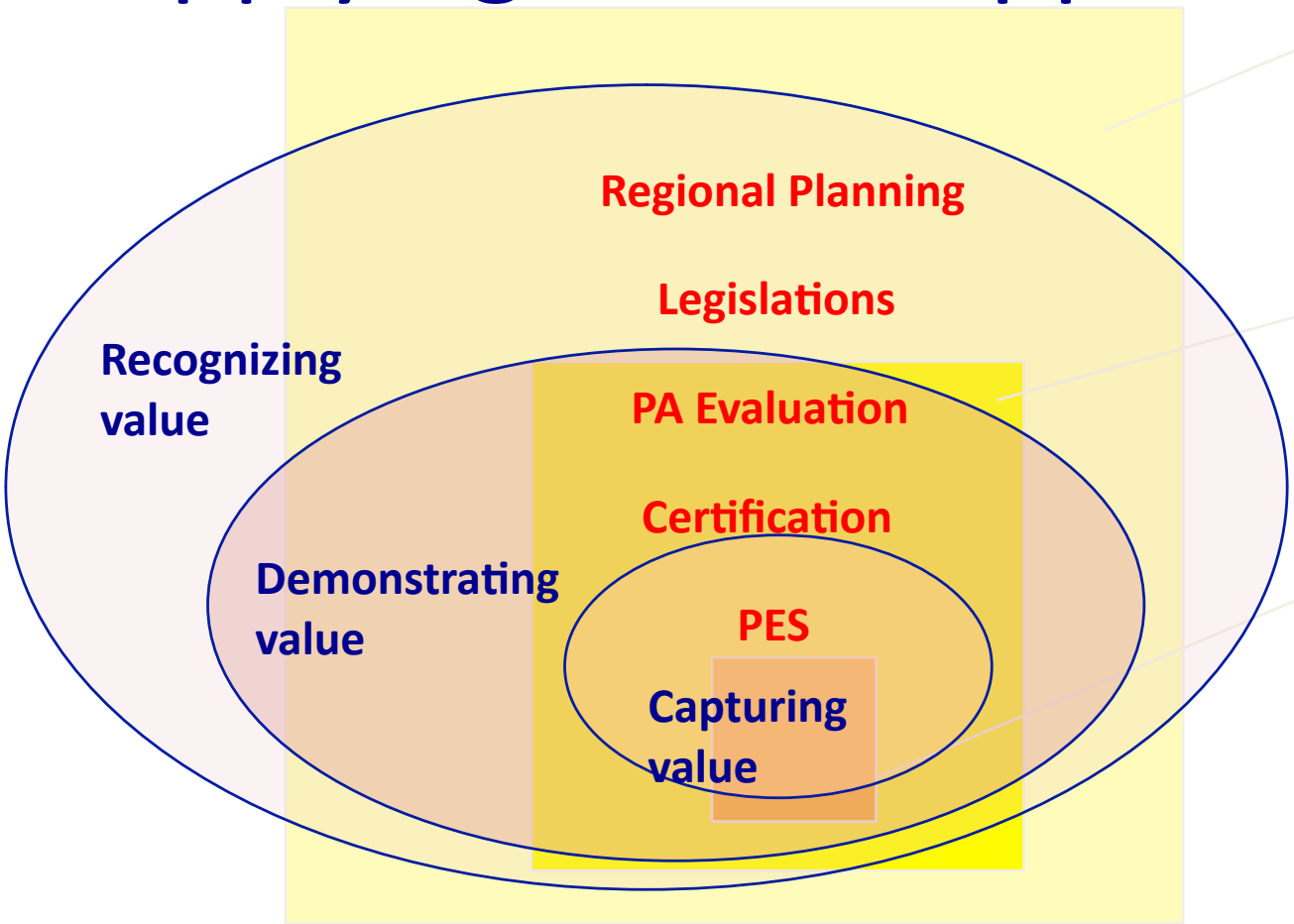
Agricultural seeds: ~$30bn

Growing markets: biotrade: natural cosmetics ~ $7 billion in 2008; Organic agriculture ~ €30.8 billion in 2006; FSC certified forests ~ 7% of the world's productive forest, in 81 countries, with a value ~ US$20 billion

Ecotourism: again $billion industry, growing fast, with significant employment

Biomimicry: growing part of architecture, engineering etc

Applying TEEB's Approach ...

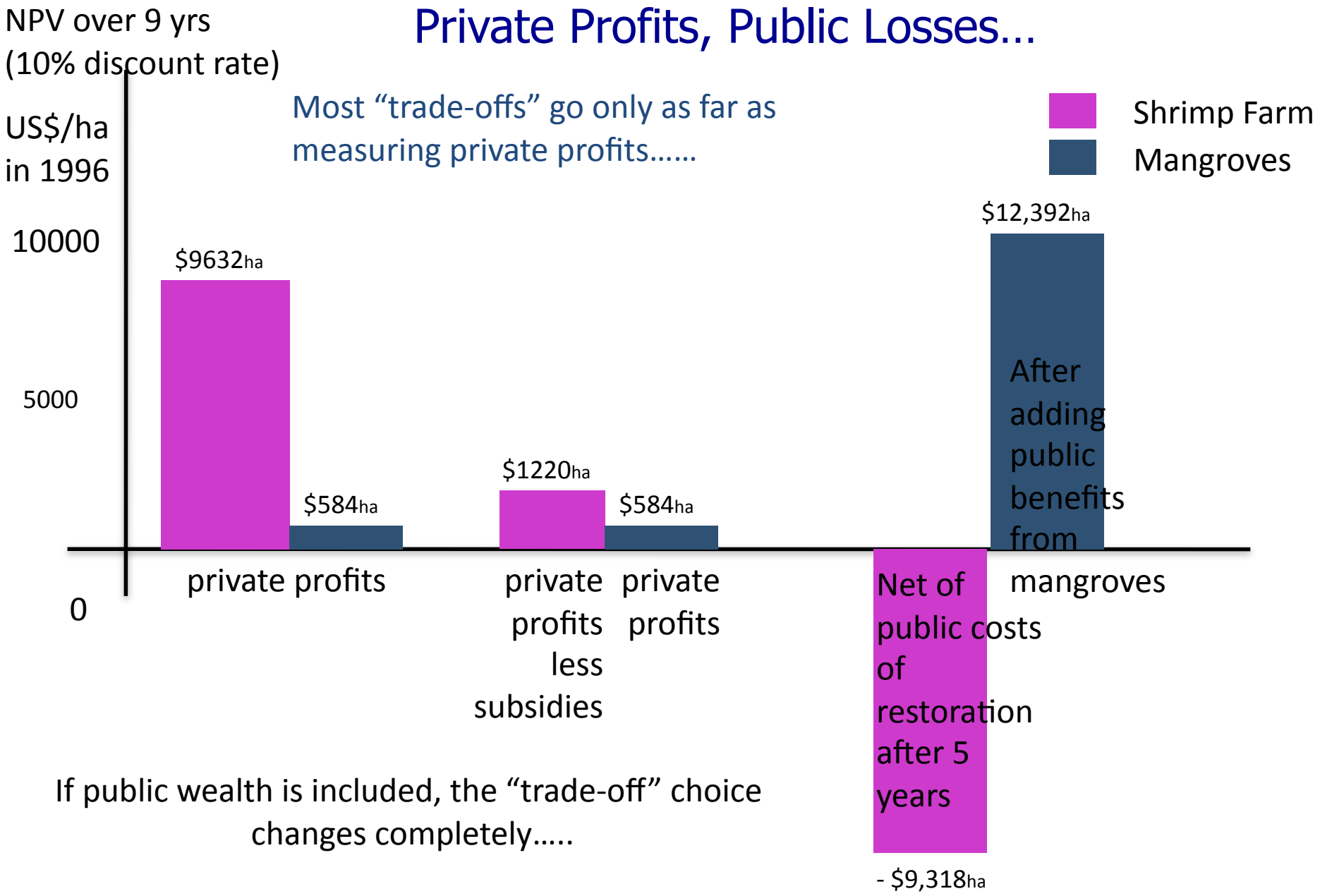


Norms, Regulations & Policies

Economic Mechanisms

Markets

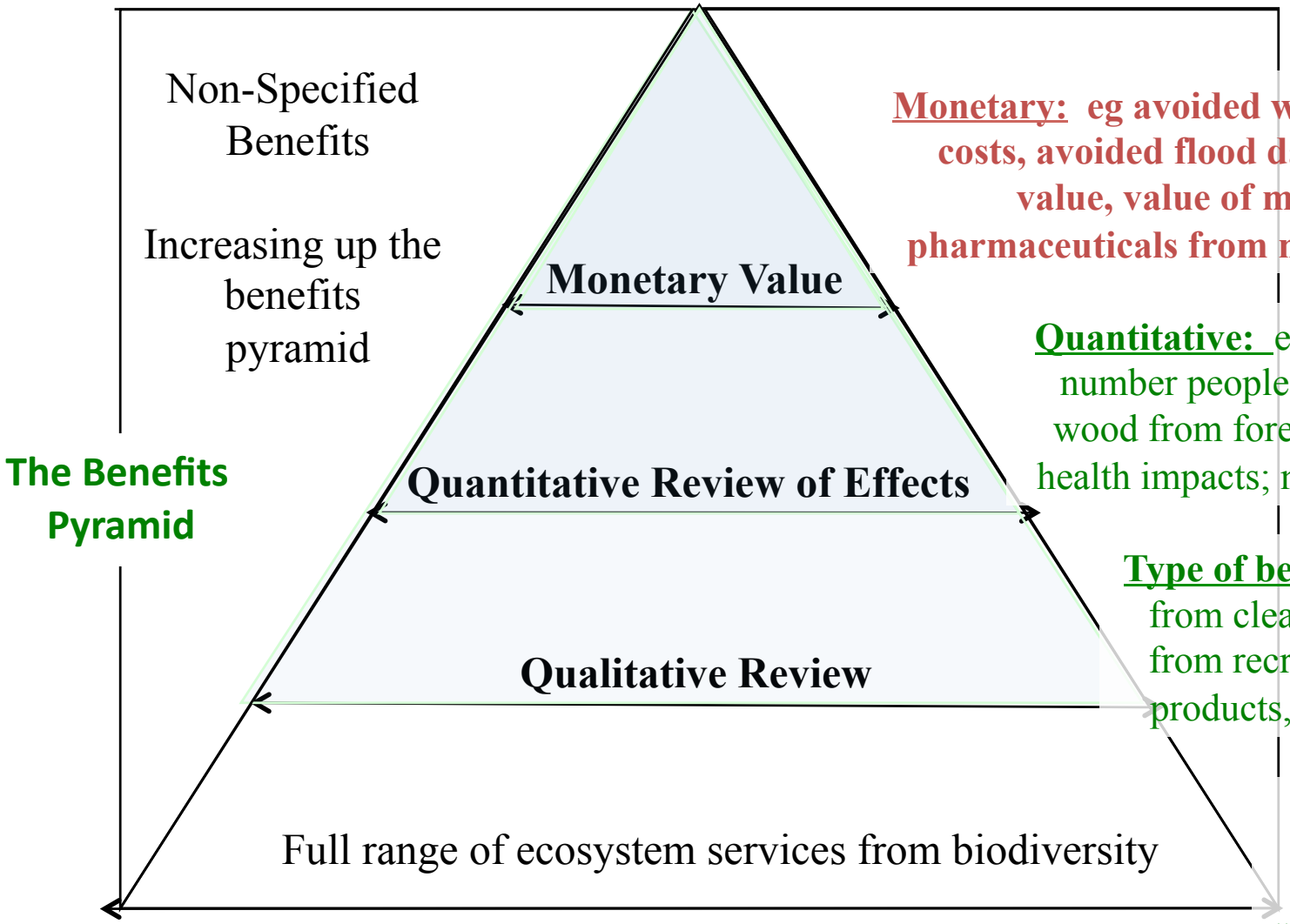
Private Profits, Public Losses...



If public wealth is included, the "trade-off" choice changes completely…..

Source: Hanley and Barbier 2009

Measuring Benefits of Ecosystem services
Answers are needed at all levels



The Benefits Pyramid

Monetary: eg avoided water purification costs, avoided flood damage, tourist value, value of medicines / pharmaceuticals from natural products

Quantitative: eg level of service, number people benefiting from wood from forests, # of avoided health impacts; number of visitors

Type of benefits; health benefits from clean air, social benefits from recreation, income from products, security, wellbeing.

Knowledge gaps
The "known-unknowns" and "unknown-unknowns"

Source: P. ten Brink: presentation at March 2008 workshop Review of Economics of Biodiversity Loss, Brussels

Natural capital is an asset for local development:

Enhancing nature's benefits through a focus on ecosystem services: silvo-pastoral management in Colombia.

(picture: CIPAV)

The problem

Pasture degradation resulting in income loss, further expansion of pasture area.

Focus on Ecosystem services

How to tackle poor pasture practices and with it soil erosion, increase of water runoff and biodiversity loss?

Policy response

Silvo-pastoral management on 3.500ha: planting improved grasses, fodder shrubs and trees. GEF-funded payment for biodiversity and carbon fixation (PES) to cover initial investment costs.

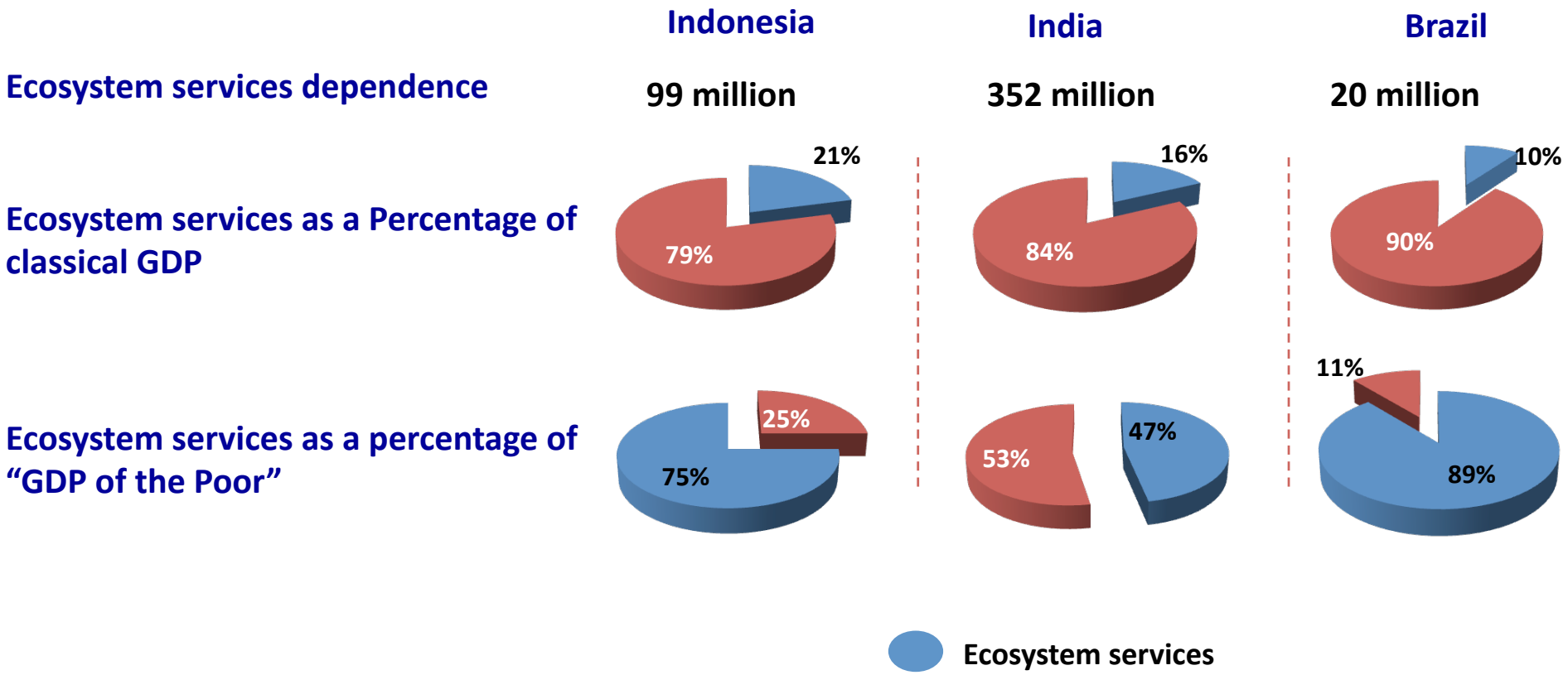
Results:

1. Enhanced local benefits: nutrient recycling, fruit, fodder, timber, water flow regulation, protection against landslides. (Farmers income increased up to US$1157/ha)
2. After the project, farmers still keep the silvopastoral systems without the PES, due to its multiple benefits.

Source:
TEEBcase Silvopastoral Project

… ECOSYSTEM SERVICES ARE a condition for local well-being:

"GDP of the Poor" is the most seriously hit by ecosystem losses



Source: Gundimeda and Sukhdev, TEEB for National Policy

Valuation of ESS from Kampala wetlands, Uganda

Services provided by the Nakivubo swamp include natural water purification and treatment & supporting small-scale income activities of poorer communities

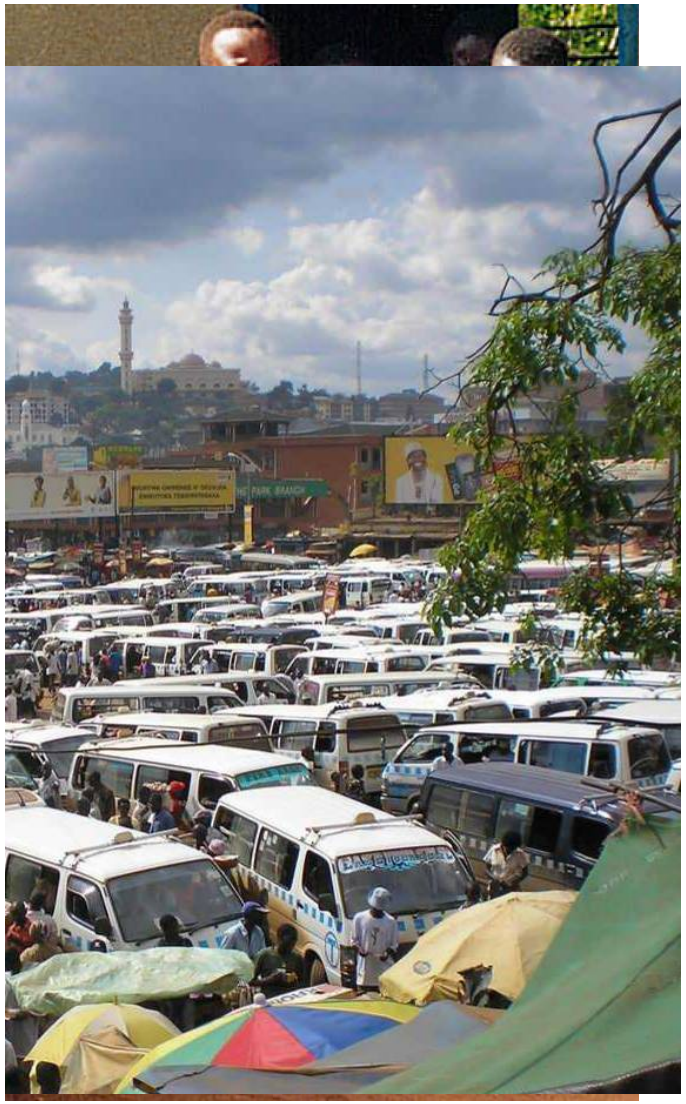
Plans to drain the Nakivubo Swamp (>40sqkm) for agriculture
→ Waste water treatment capacity of the swamp was assessed (Emerton 2004)

Maintaining the wetlands: ~235.000$ p.a.
Running a sewage treatment facility of equivalent capacity: ~2Mio. US$ p.a.

draining plans abandoned & Nakivubo Swamps designated as PA

Recognising and demonstrating the values again critical for decision making. Capacity support .

The opportunity: Maintaining, restoring or enhancing nature's benefits



- **it can help save municipal costs**
  - Quito's drinking water comes cheaper from 2 national parks
  - Kampala's wetlands effectively treat sewage ($1M vs $1. 75M replacement)
- **it can protect against natural hazards**
  - mangroves protect against typhoons in northern Vietnam ($1.1 million investment in mangroves saved US $7.3m in dyke maintenace)
- **it can boost the local economy**
  - it pays to protect sharks in the Maldives (3300$ tourism vs $32 for a single catch)
- **it can help in efficient utilisation of natural resources**

Source: all examples are TEEBcases (teeb.org)

Blue Flag Certification for coastal areas: an economic argument in South Africa

- The Blue Flag certification scheme is targeted at local authorities, the public and the tourism industry in coastal areas.
- Blue flag awarded if it meets meet certain environmental, amenity and safety criteria and assures recreational users of a quality visit to the beach.
- Economic benefits increase due to the Blue Flag award.
- Loss of Blue Flag status in town Margate resulted in potential economic loss of between US$ 2.7 million and US$ 3.4 million per annum.
- In Durban, a decrease in consumer confidence was attributed partly to the lost status in 2008

BES opportunities: “biodiversity business”

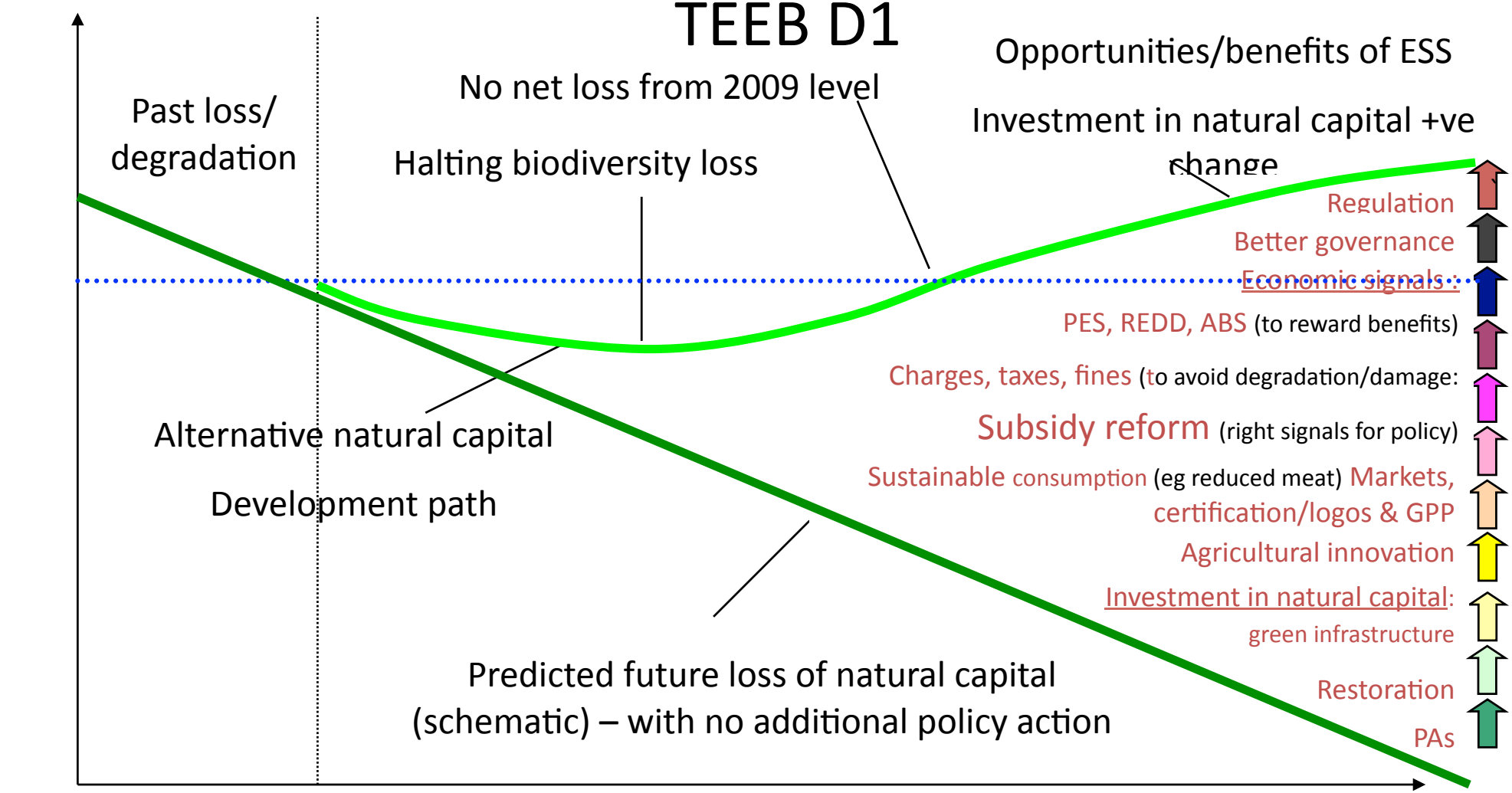
Adding BES to existing business

- Agriculture
- Biodiversity mgmt services
- Cosmetics
- Extractive industries
- Finance
- Fisheries
- Forestry
- Garments
- Handicrafts
- Pharmaceuticals
- Retail
- Tourism

New markets for BES

- Bio-carbon & REDD
- Biodiversity banking
- Enabling policy & tools

tools for an alternative development path and need for innovative financing – Recommendations from TEEB D1



Need a portfolio of instruments, need BD action + integration, need engagement by all stakeholders; need good governance, "joined-up-thinking"

How is this possible?

- Indicators and tools to measure urban sustainability (SEA, IMS, EMS, ISO, Biodiversity indices)
- Green infrastructure and design (creation of green networks with green belts, arrest urban sprawl through city zoning; reduce municipal waste and recycle the waste; promote low energy housing and good public transport; set up measures for water saving in buildings, develop private green spacesm green rooftops, community gardens, green walls and solar plants.

We have not understood biodiversity completely that we can risk losing it…
Time to act quickly…..

Thank you for your attention