



REGIONAL FLYWAY INITIATIVE TRAINING SERIES:  
**From Wetland Ecosystem Services  
to Nature-based Solutions**  
ADB HQ on 27–30 June 2023

# Introduction to Ecosystem Services Assessment

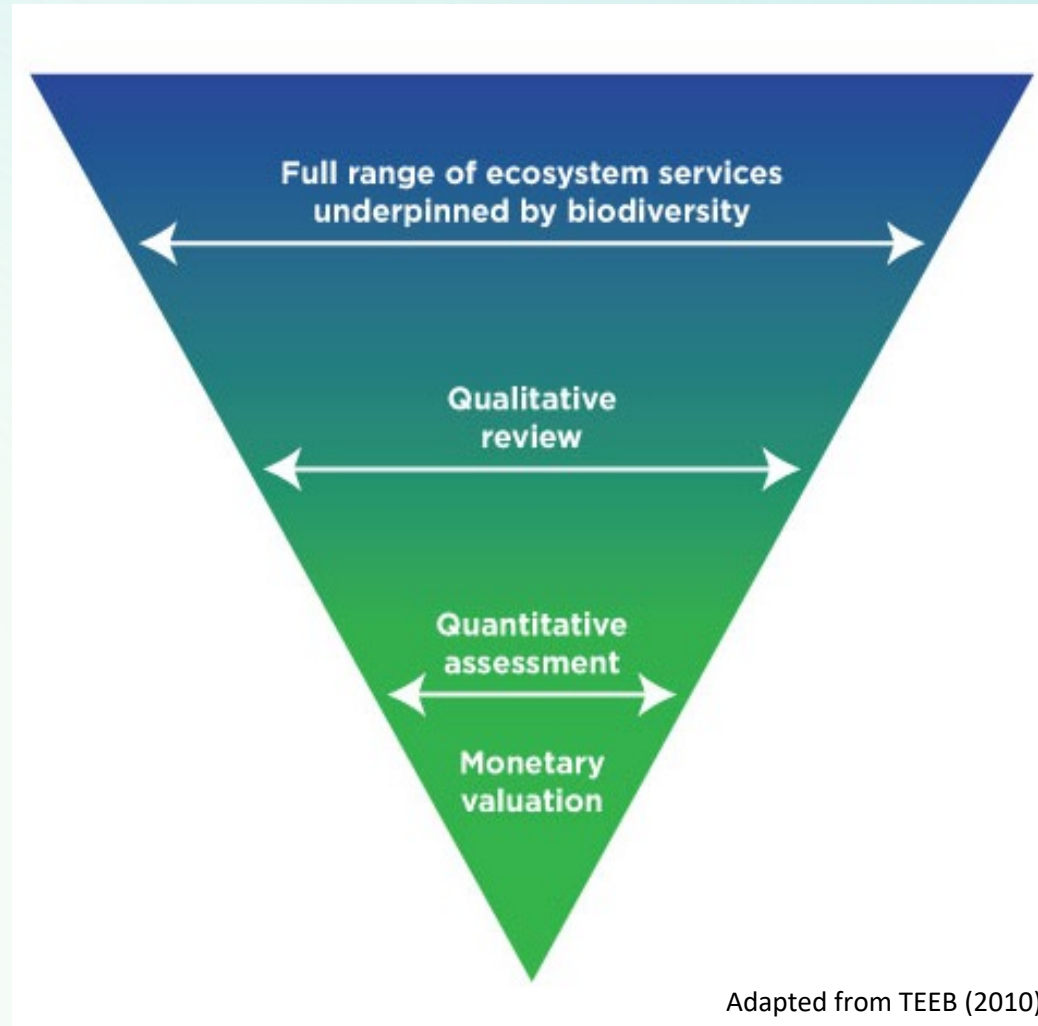
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# Economic valuation of ecosystem services (ES)

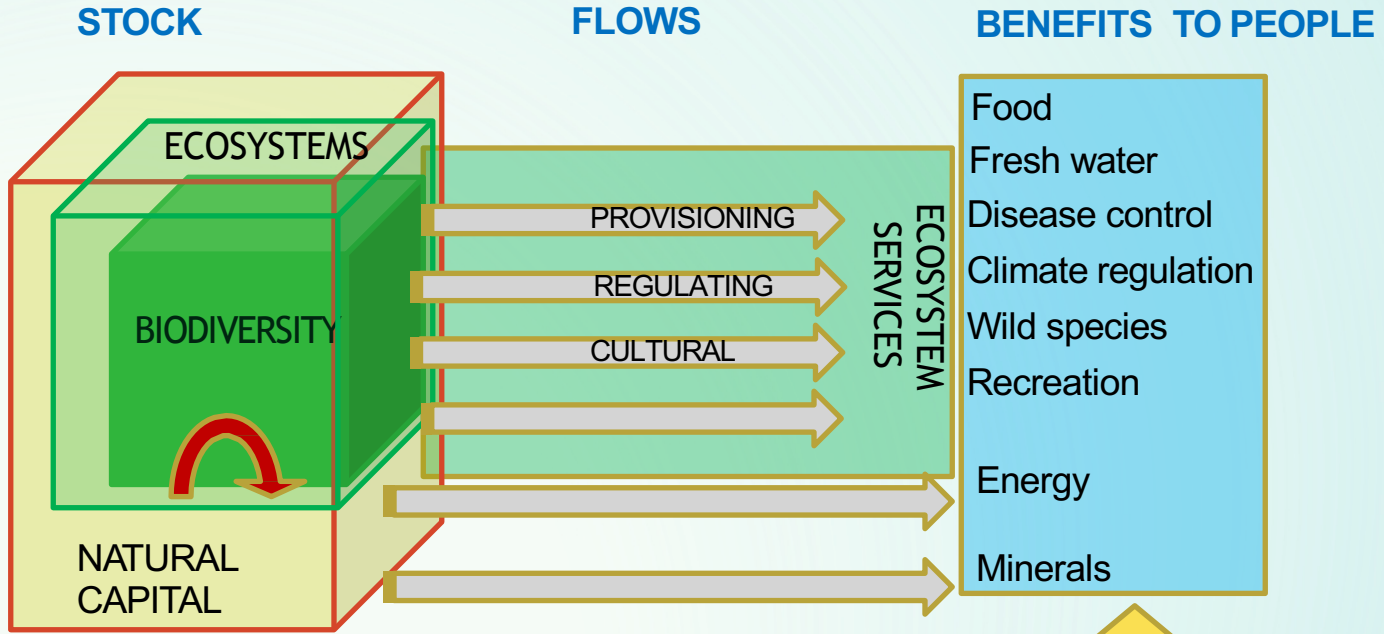
**PRO:** Frequently used to present ecosystem value in a policy-relevant and accessible way (leverage into decision-making)

**PRO:** Can use a range of methods to assess the value and relative importance of the full range of ES underpinned by biodiversity

**CON:** Can only capture some of the total value of ecosystems



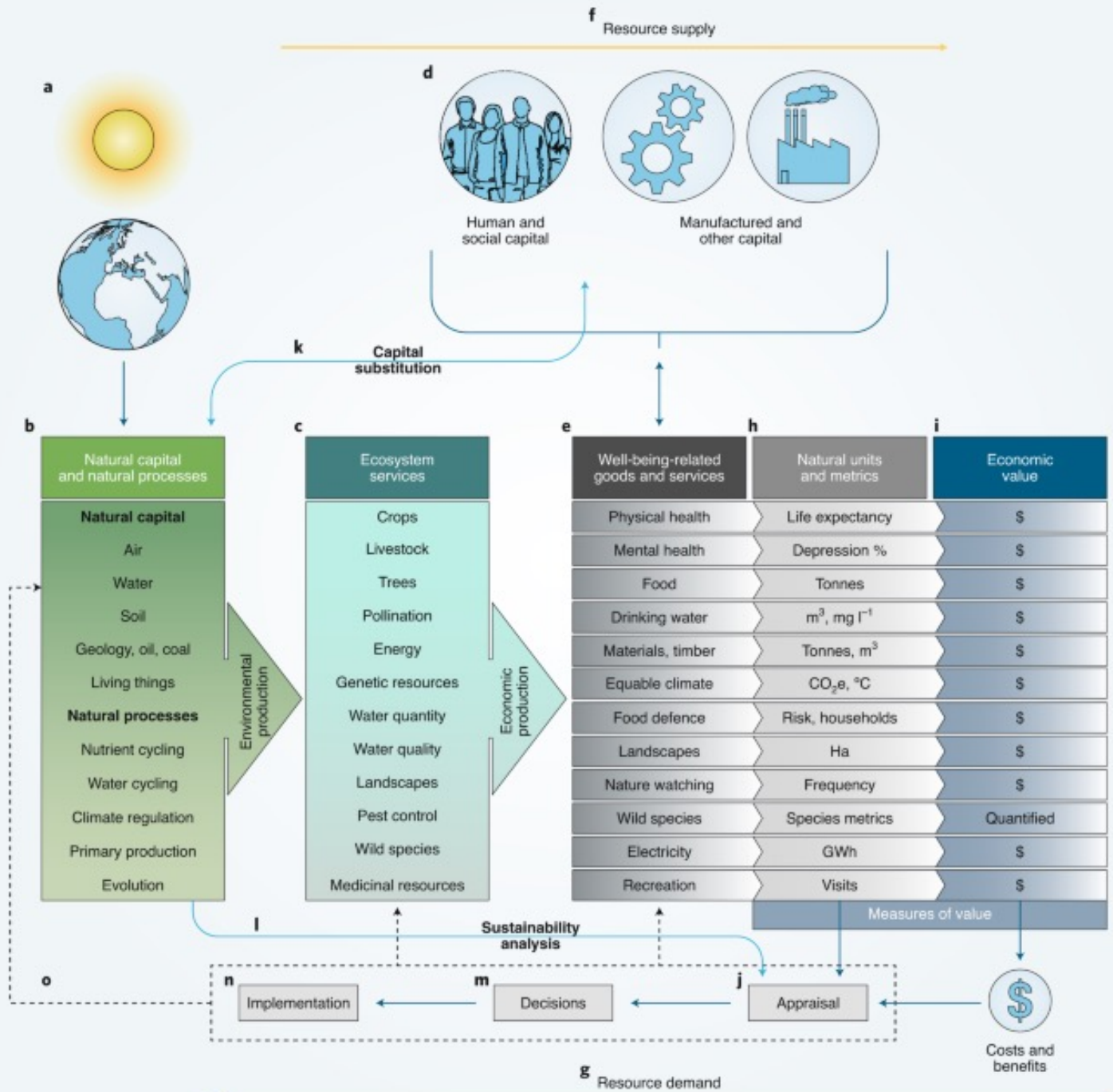
# Natural capital



Natural capital is a stock, from which people derive benefits. One subset of the stock of natural capital is ecosystems, and the benefits are then called ecosystem services

Other capital inputs

# Natural capital framework (Bateman and Mace, 2020)





# Toolkits for ES assessment

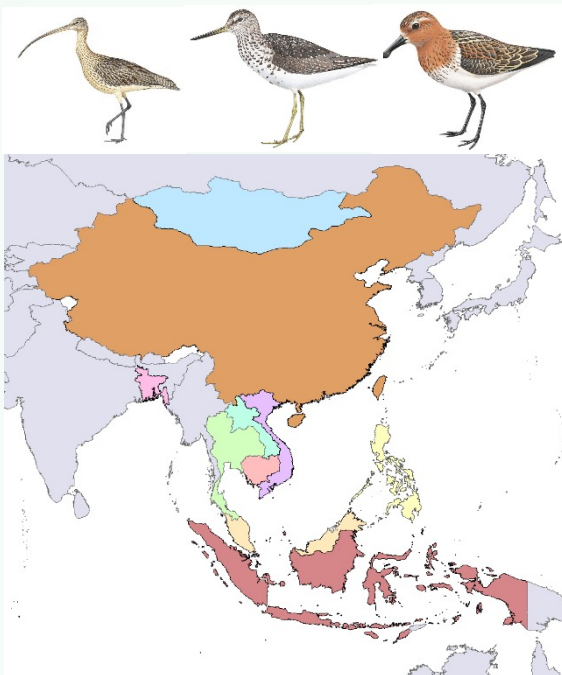
Two types of tools:

1. Written step-by-step tools:
  - Written guidance documents with specific measurement protocols
  - ES assessment of one site
  - e.g. TESSA
  
2. Computer-based modelling tools:
  - Software or web-based tools
  - ES assessment of one or more sites

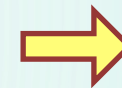
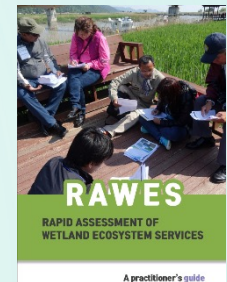


# TESSA is a flexible framework

- Practical and yet provide robust local-relevant data
- Suitable for non-experts (limited capacity and knowledge)
- Generic – applicable in all contexts
- Welcome “add-ons” and other complementary methods



**147 priority sites**



Recommended documentation for ecosystem services delivered by Key Biodiversity Areas

Prepared by the SNAPP working group on Ecosystem Services and Key Biodiversity Areas



# What is TESSA?

## Toolkit for Ecosystem Service Site-based Assessment



### TOOLKIT FOR ECOSYSTEM SERVICE SITE-BASED ASSESSMENT

Version 3.0

Kelvin S.-H. Peh, Andrew P. Balmford, Richard B. Bradbury, Claire Brown, Stuart H. M. Butchart, Francine M. R. Hughes, Lisa Ingwall-King, Michael A. MacDonald, Anne-Sophie Pellier, Ali J. Stattersfield, David H. L. Thomas, Rosie J. Trevelyan, Matt Walpole & Jenny C. Merriman.



Short communication

### TESSA: A toolkit for rapid assessment of ecosystem services at sites of biodiversity conservation importance

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#### ABSTRACT

Sites that are important for biodiversity conservation can also provide significant benefits (i.e. ecosystem services) to people. Decision-makers need to know how change to a site, whether development or restoration, would affect the delivery of services and the distribution of any benefits among stakeholders. However, there are relatively few empirical studies that present this information. One reason is the lack of appropriate methods and tools for ecosystem service assessment that do not require substantial resources or specialist technical knowledge, or rely heavily upon existing data. Here we address this gap by describing the Toolkit for Ecosystem Service Site-based Assessment (TESSA). It guides local non-specialists through a selection of relatively accessible methods for identifying which ecosystem services may be important at a site, and for evaluating the magnitude of benefits that people obtain from them currently, compared with those expected under alternative land-uses. The toolkit recommends use of existing data where appropriate and places emphasis on enabling users to collect new field data at relatively low cost and effort. By using TESSA, the users could also gain valuable information about the alternative land-uses; and data collected in the field could be incorporated into regular monitoring programmes.

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#### 1. Introduction

There has been growing international recognition that the contribution that nature makes to human well-being is often not adequately valued or integrated in decision-making, and that ecosystem services are being eroded as a result (MEA (Millennium Ecosystem Assessment), 2005), with considerable cost to society

(Kumar, 2010). Increasingly, governments are being asked to initiate a range of policy processes aimed at integrating the environment and development, including environmental mainstreaming (UNDP-UNEP (United Nations Development Programme – United Nations Environment Programme), 2009), achieving the proposed Sustainable Development Goals (UNCSD (United Nations Conference on Sustainable Development) Secretariat, 2012) and delivering a Green Economy (ten Brink et al., 2010). In addition, countries have committed to assessing their contribution to the Convention on Biological Diversity's Strategic Plan 2011–2020 by tracking progress against the 20 Aichi Biodiversity Targets

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# A collaborative contribution:



The Toolkit for Ecosystem Service Site-based Assessment has been developed by



# Piloting, feedback, development, and improvement:

## Donors



## Wider development

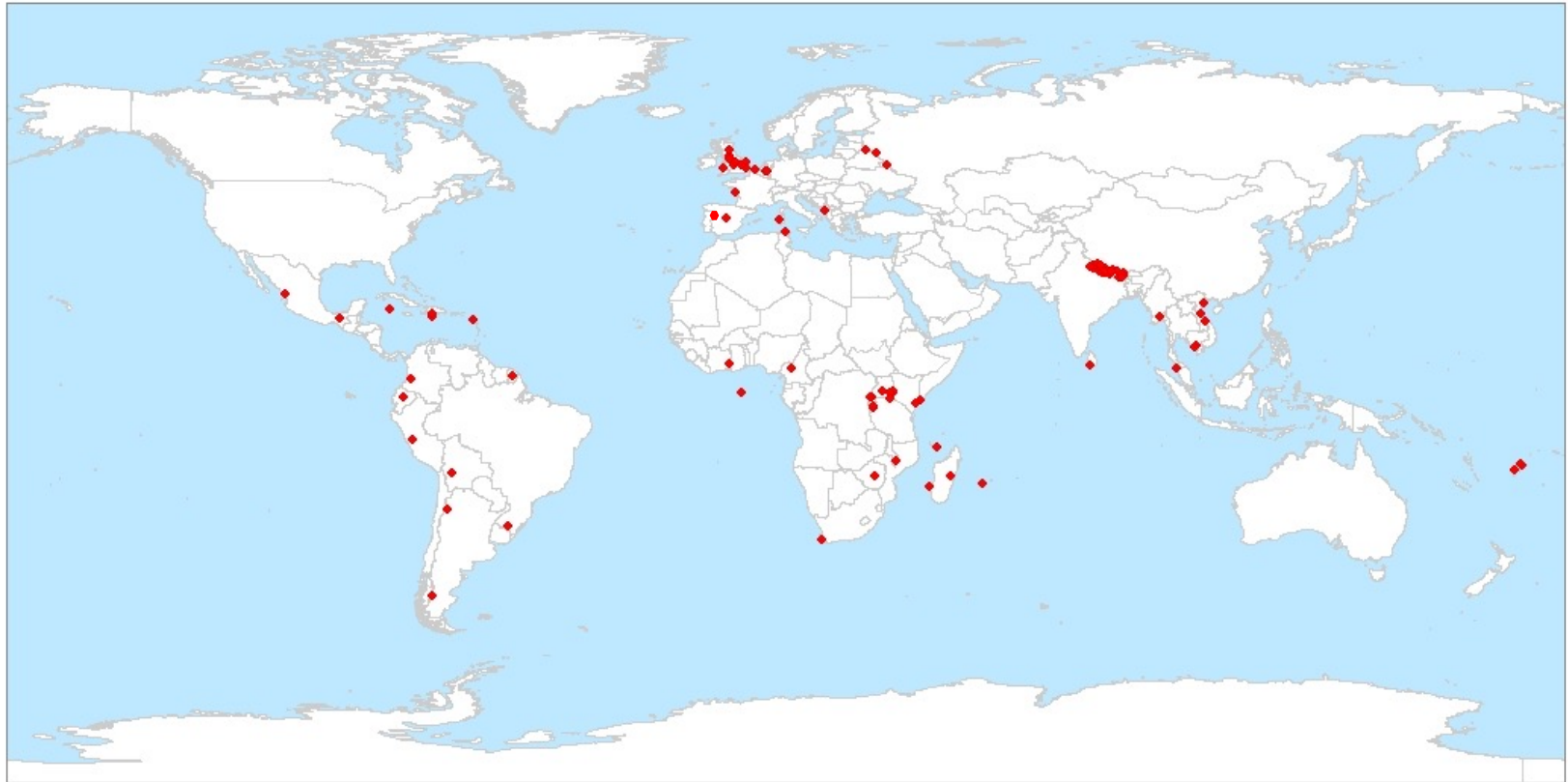


## Implementation





# TESSA applications worldwide



## Legend

◆ TESSA Project Sites

Number of downloads (2021): >4,900



Produced by the Information Management Division, BirdLife International, February 2019

[Hatch group page : TESSA Publications and Case Studies](#)

# TESSA users

- Conservation practitioners (first target)
- International NGOs, local NGOs, government officials
- Natural resource managers: forestry, fisheries, water managers, land use planners, development organizations, researchers, etc.
- The private sector



# Key concepts and principles of TESSA

- Relatively rapid framework
- Practical step-by-step guidance on how to understand, assess, and monitor ES
- Scientifically robust data to influence management, policy- or decision-making (and for monitoring)
- Helps non-experts with limited capacity to value and compare multiple ES
- Involves stakeholders and beneficiaries



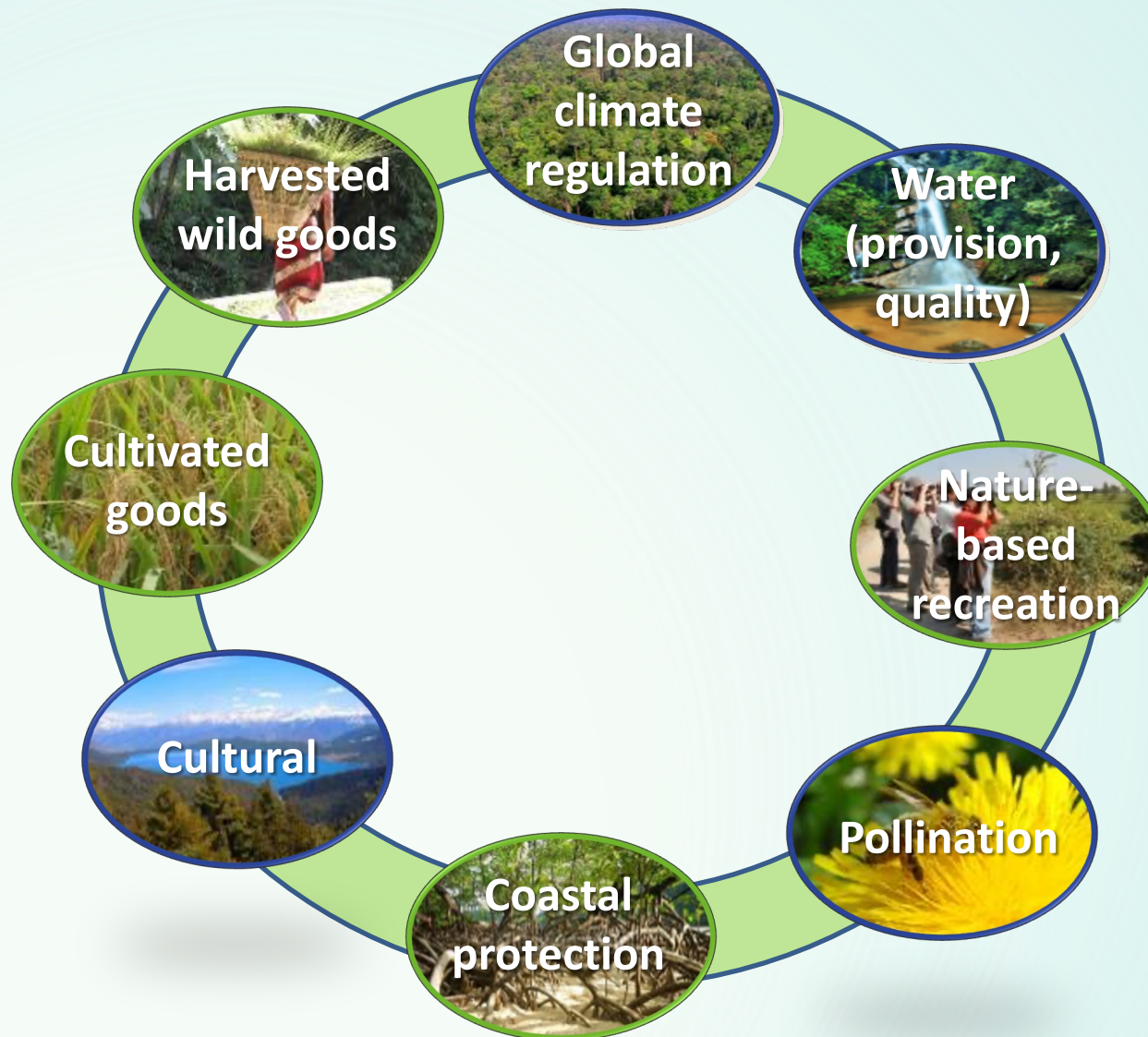


# Key concepts and principles of TESSA (cont.)

- For all terrestrial and wetland ecosystems
- For use in developed and developing countries
- Impacts of change: estimates difference between current state and plausible alternative state(s)
- Identifies:
  - **ES** (and stocks of natural capital) significant at a site
  - **Data** needed to measure them
  - **Methods** or sources that can be used to obtain the data
  - How to **communicate** the results



# ES included in TESSA v3.0



# Practical methods available

**Simple &  
rapid**

**Optional**

	Nature-based recreation	Pollination	Coastal protection	Cultural
Biophysical / quantitative methods	Expert interviews	Dependency ratios	Mapping / visual inspection / GPS	Questionnaires / surveys
	Published data	Desk-based methods	Literature / databases / numerical models	Interpretative drawings
	Visitor surveys / census	Visitation rates	Sediment traps / marker horizons	Photo voice / Storytelling
Economic Valuation methods	Visitor spend	Exclusion experiments	Damage reduction	
	Travel cost			
	<i>Benefits transfer</i>			



# Assessing the impact of change

**Current state**



**Alternative state**



100% Native forest

95% Subsistence agriculture  
5% Secondary Forest

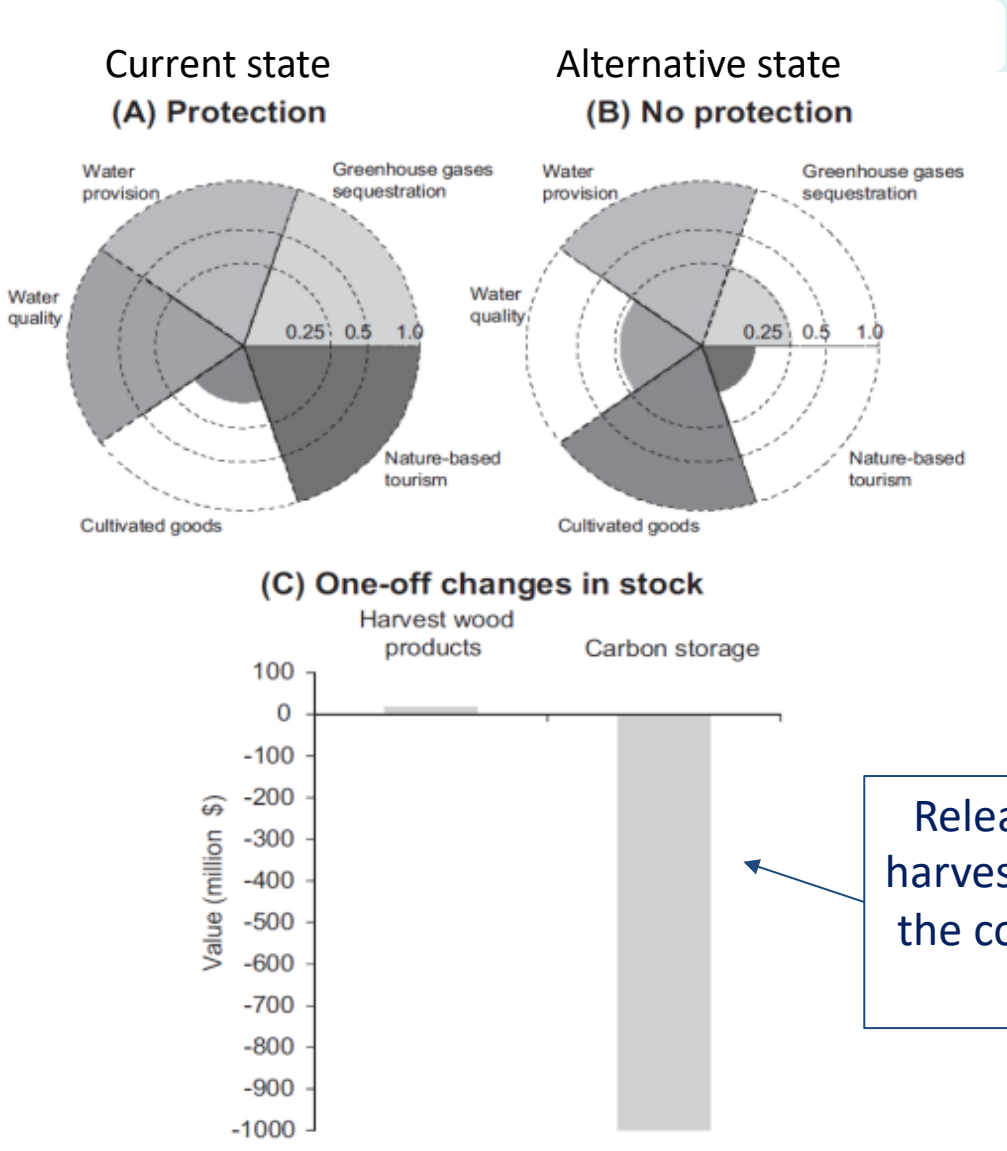
# Why comparative valuation of multiple ES?

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- Simple assessment of the gross values of a particular service is less useful:
  - Relative values give decision-makers an idea of the net consequences of decisions
- Understand the impacts of management or land-use change on ES delivery
- Influence decision-making and promote efficient planning
- Preserve ES & their associated benefits people rely on
- Inform on human well-being & biodiversity conservation objectives

# Comparative valuation of ES

Shivapuri-  
Nagarjun  
National  
Park,  
Nepal

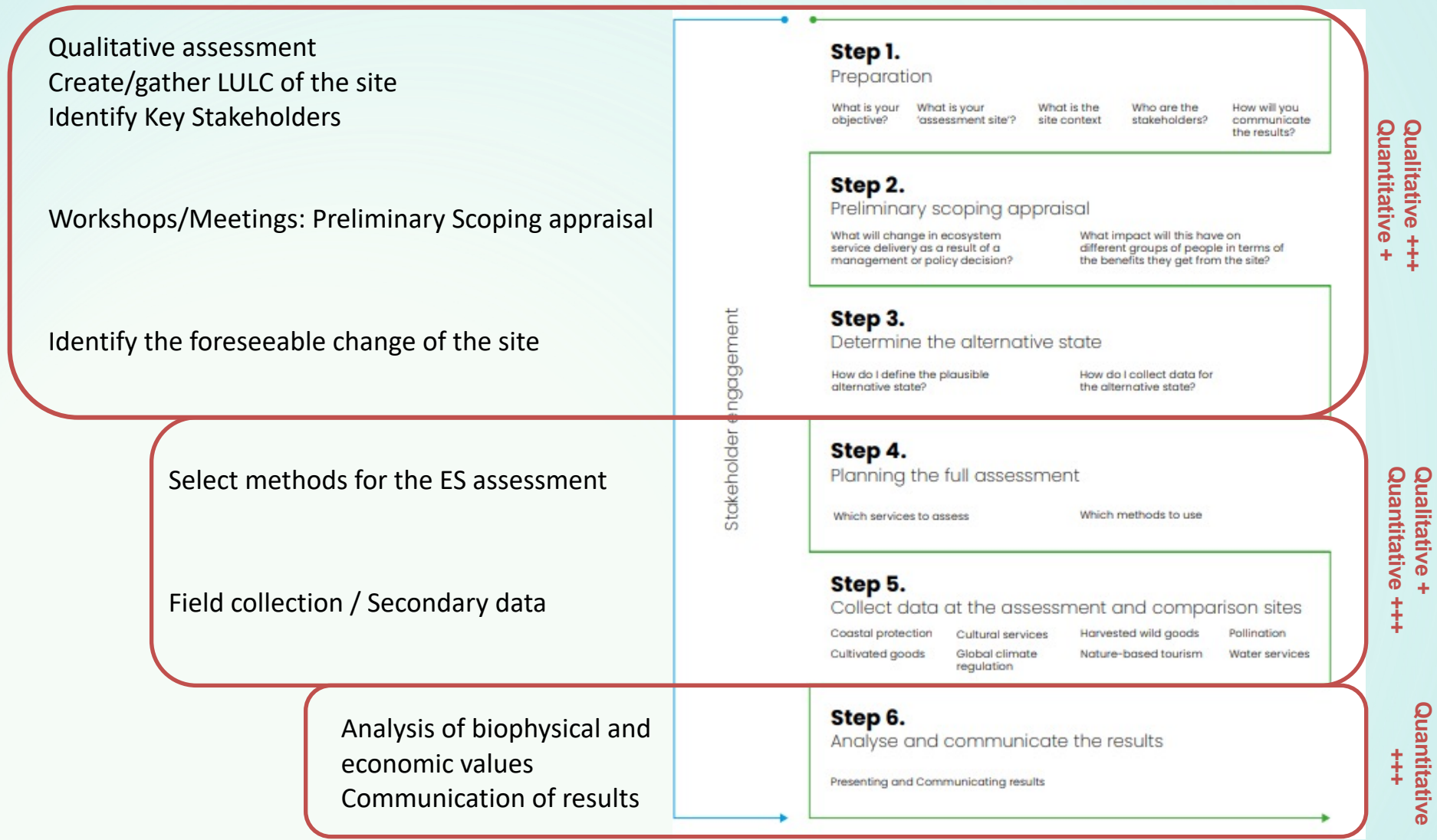


Net monetary  
benefit was  
estimated at  
\$11million/year

Release of carbon and use of harvest of wood product during the conversion from Protected to NON-protected



# Steps of TESSA



# TESSA also includes:

- Decision trees (flow charts)
- Detailed methods
- Worked examples
- Additional Guidance (templates)
- Section on data synthesis



# Importance of stakeholder engagement

- TESSA encourages stakeholder engagement throughout the process from Step 1 through 6
- Guidance on how to identify and engage the appropriate people
- Engagement throughout the process built strong relationships invaluable for the project(s), improves information flow, and fosters ownership





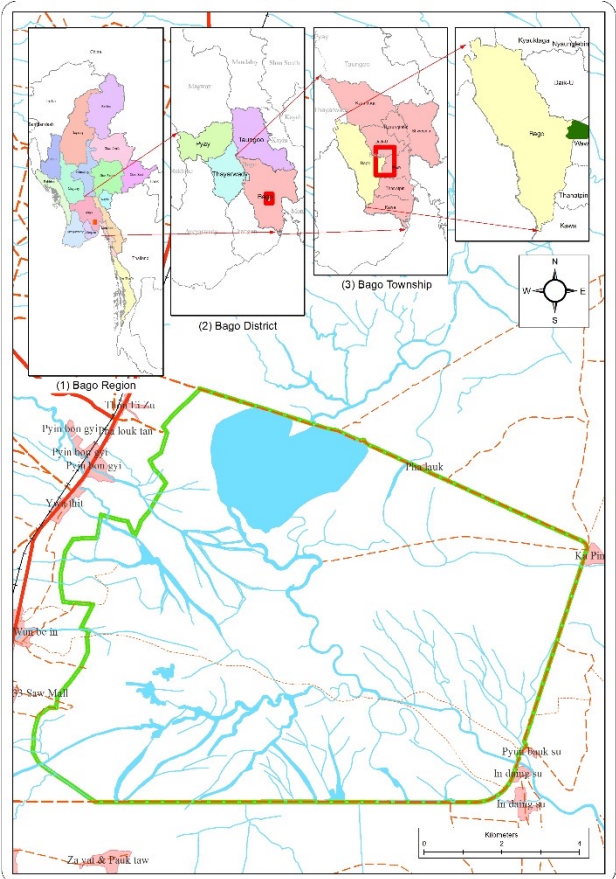
# Importance of beneficiaries

- An ES only exists if someone derives benefits from it
- Social, political, economic, and ecological factors play a role in the **distribution of benefits**, and the **impacts of change**. These may not be equitable
- Essential to **understand who the beneficiaries are** so that the full consequences of changes in ES can be assessed



# Case study: Moeyungyi Wetland Wildlife Sanctuary, Myanmar

Location Map of Moeyungyi Wetland Wildlife Sanctuary



Benefit

**Water : \$ 8.5 million/year**  
 Irrigation water is worth \$83,400/year  
 Domestic use of water is worth \$7,987,000/year (\$1,280/household/year)  
 Flood protection function to the downstream region is worth \$458,000/year

**Harvested Wild Goods : \$ 16.2 million/year**  
 Fish production of the wetland is worth \$15,360,000/year (\$3,360/household/year)  
 Buffalo grazing and molluscs for duck food in the wetland is worth \$774,000/year and \$75,000/year, respectively. Lotus stalk harvest for waving textile is worth \$19,000/year

**Cultivated Goods : \$ 0.4 million/year**  
 Rice production inside the sanctuary is worth \$438,000/year (\$548/ha/year)

**Nature-based Recreation : \$ 0.07 million/year**  
 Foreign and domestic tourists and visitors pay a travel cost equal to \$74,000/year

**Carbon Storage : \$ 91.6 million**  
 The benefit of global climate regulation from the carbon stored in the wetland is \$91,595,000. This is an one-off stored value, i.e. not an annual value.

Cost

**GHG Emission : - \$ 3.1 million/year**  
 Paddy fields release CO<sub>2</sub>, Methane and Nitrous which accelerates climate change. The cost of these are \$3,136,000/year.

**Management Cost : - \$ 0.02 million/year**  
 The management cost of the sanctuary is about \$22,000/year and this is used for various activities such as monitoring and controlling the use of the resources, awareness raising for conservation etc.

**Net Benefit \$ 22.1 million/year**  
**Plus \$ 91.6 million of carbon storage function**



# THANK YOU

More information: <https://birdlife-hatch.org/topics/30877/feed>

Enquiries: [tessa@birdlife.org](mailto:tessa@birdlife.org)

Version 3.0 available to download: <http://tessa.tools>







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