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**Introduction to ecosystem services assessment
tools: the Toolkit for Ecosystem Service Site-based
Assessment (TESSA)**

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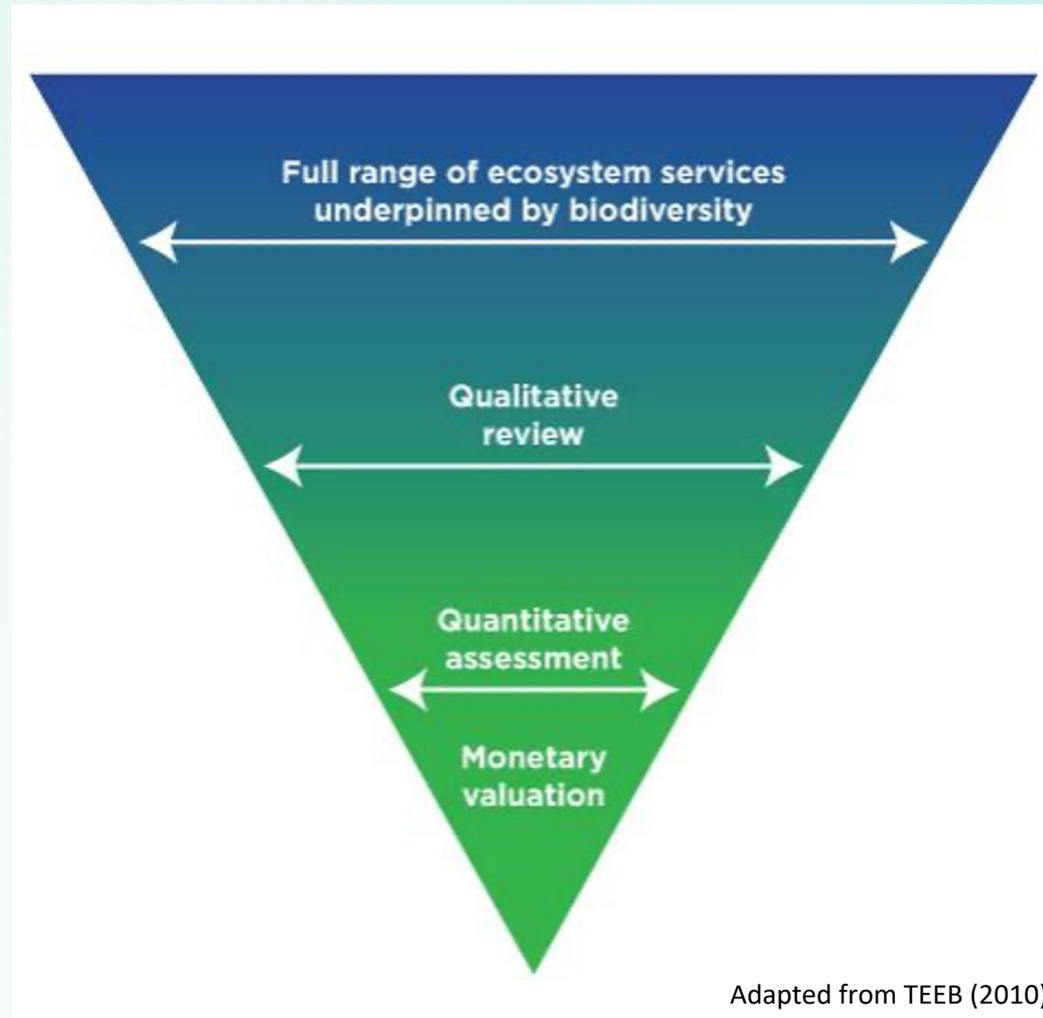
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Economic valuation of ecosystem services (ES)

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



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



What is TESSA?

Toolkit for Ecosystem Service Site-based Assessment



TOOLKIT FOR ECOSYSTEM SERVICE SITE-BASED ASSESSMENT

Version 3.0

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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 (Iten 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



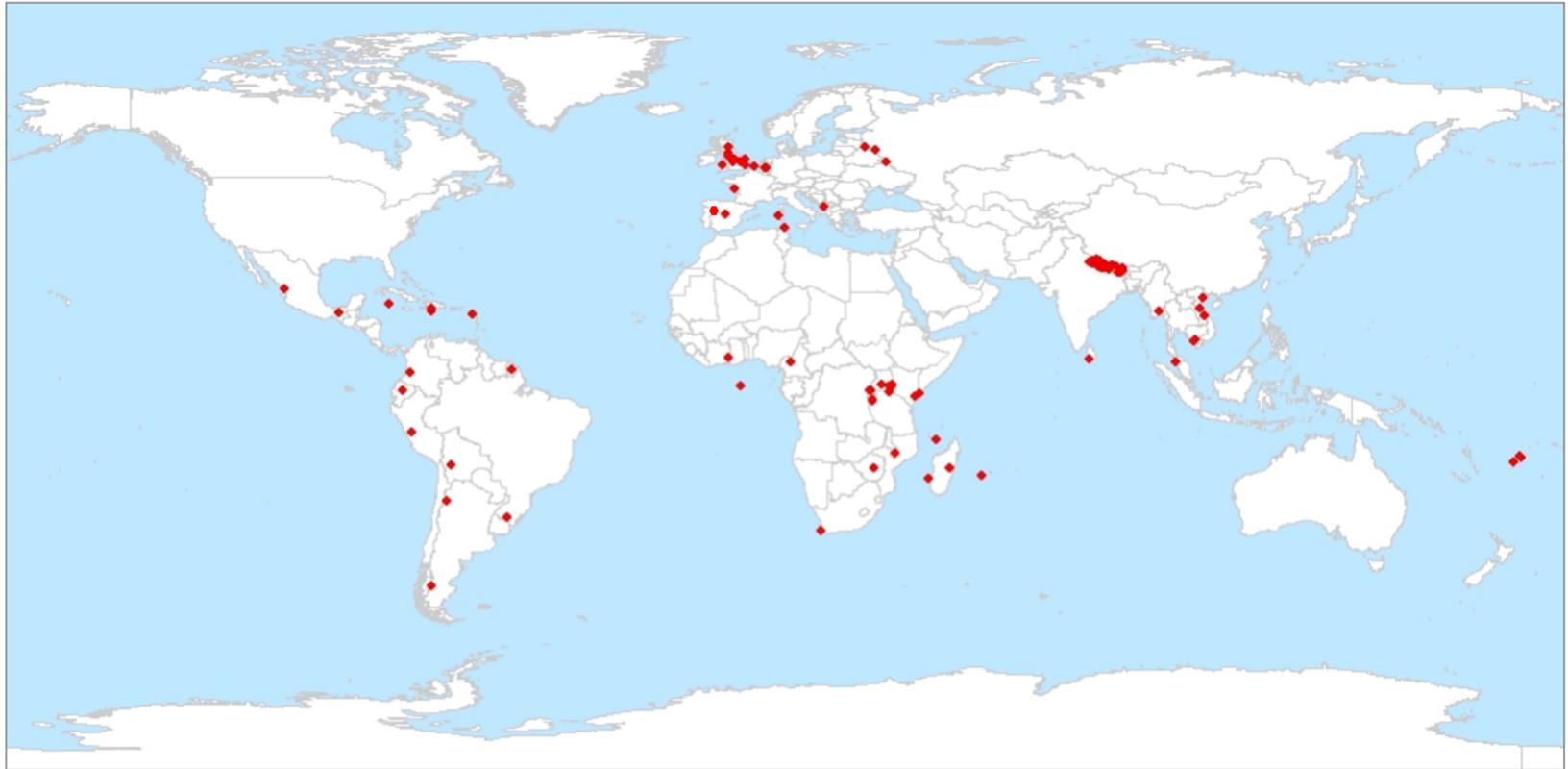
Wider development



Implementation



TESSA applications worldwide



Legend
◆ TESSA Project Sites

Number of downloads (2021): >4,900



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

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

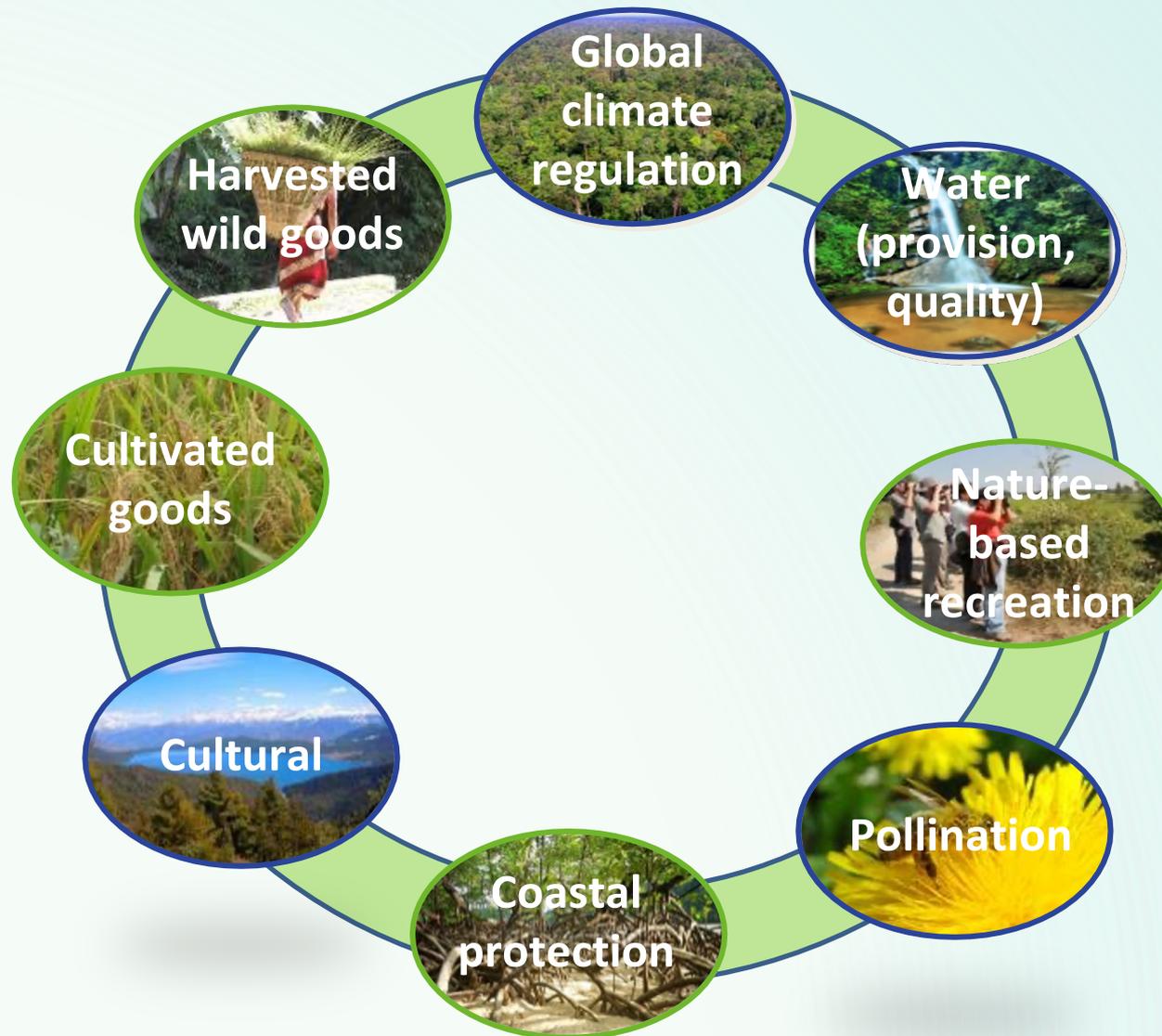


Key concepts and principles of TESSA (cont.)

- 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



100% Native forest



Alternative state



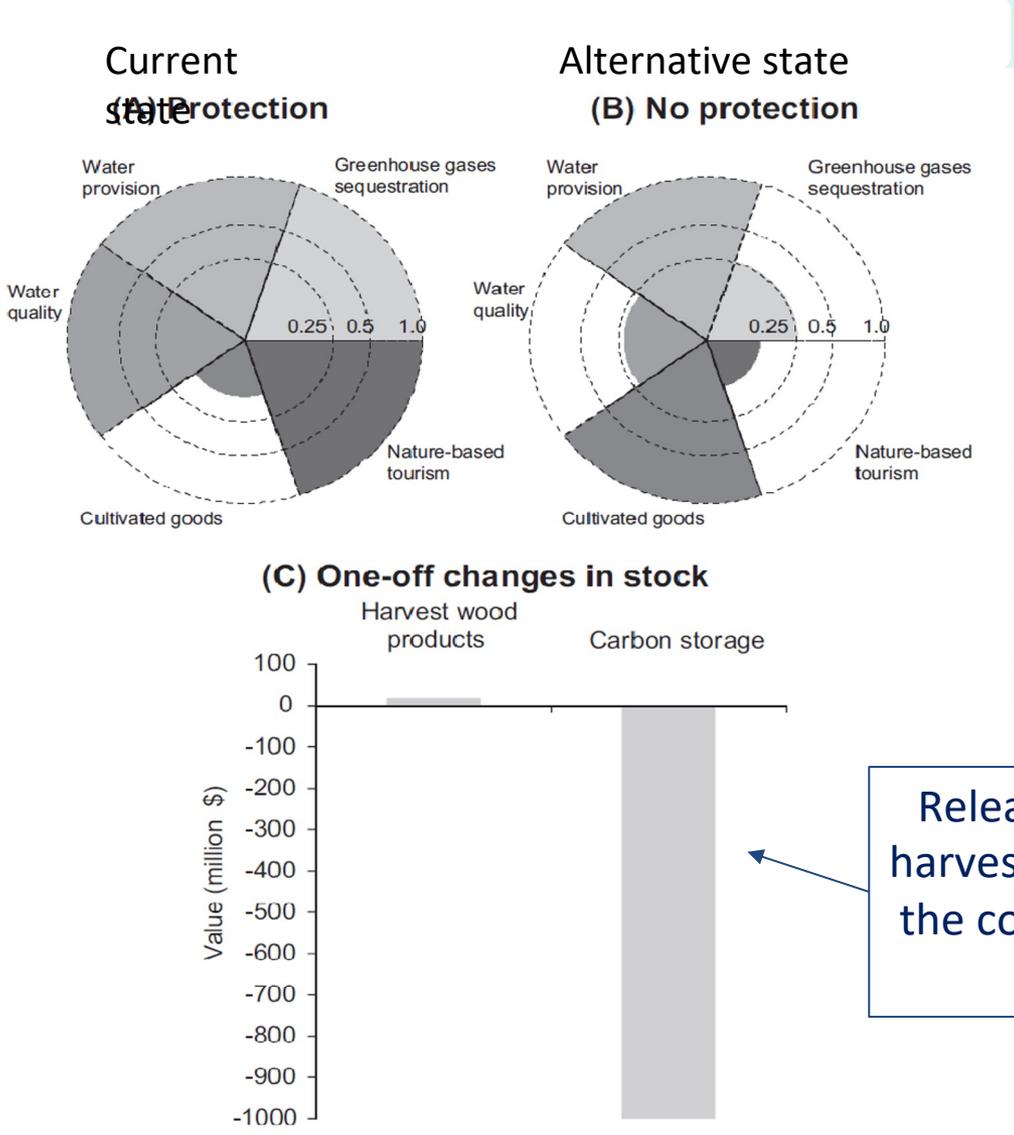
95% Subsistence agriculture
5% Secondary Forest

Why comparative valuation of multiple ES?

- 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

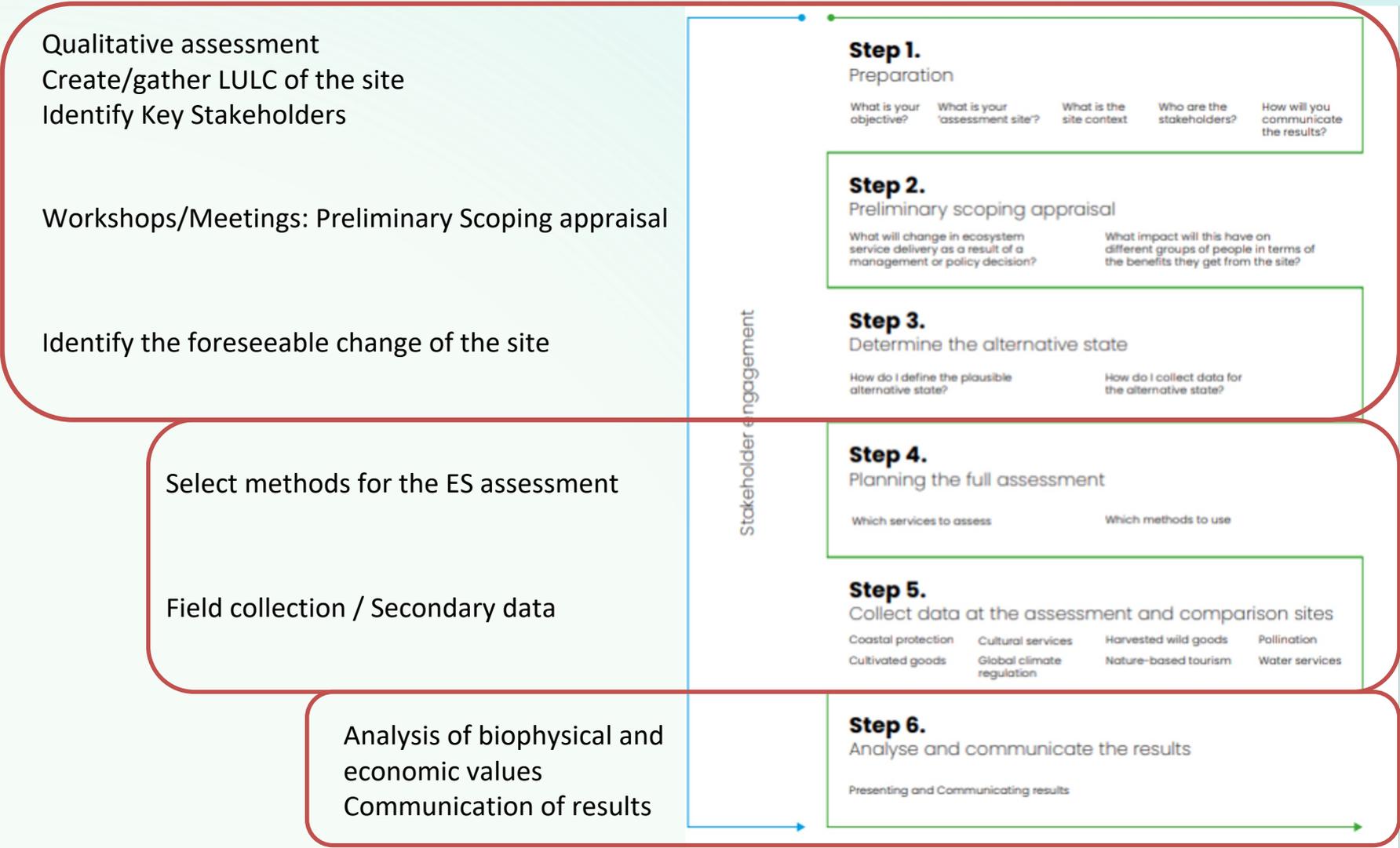
Comparative valuation of ES

Shivapuri-
Nagarjun
National
Park,
Nepal



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

Steps of TESSA



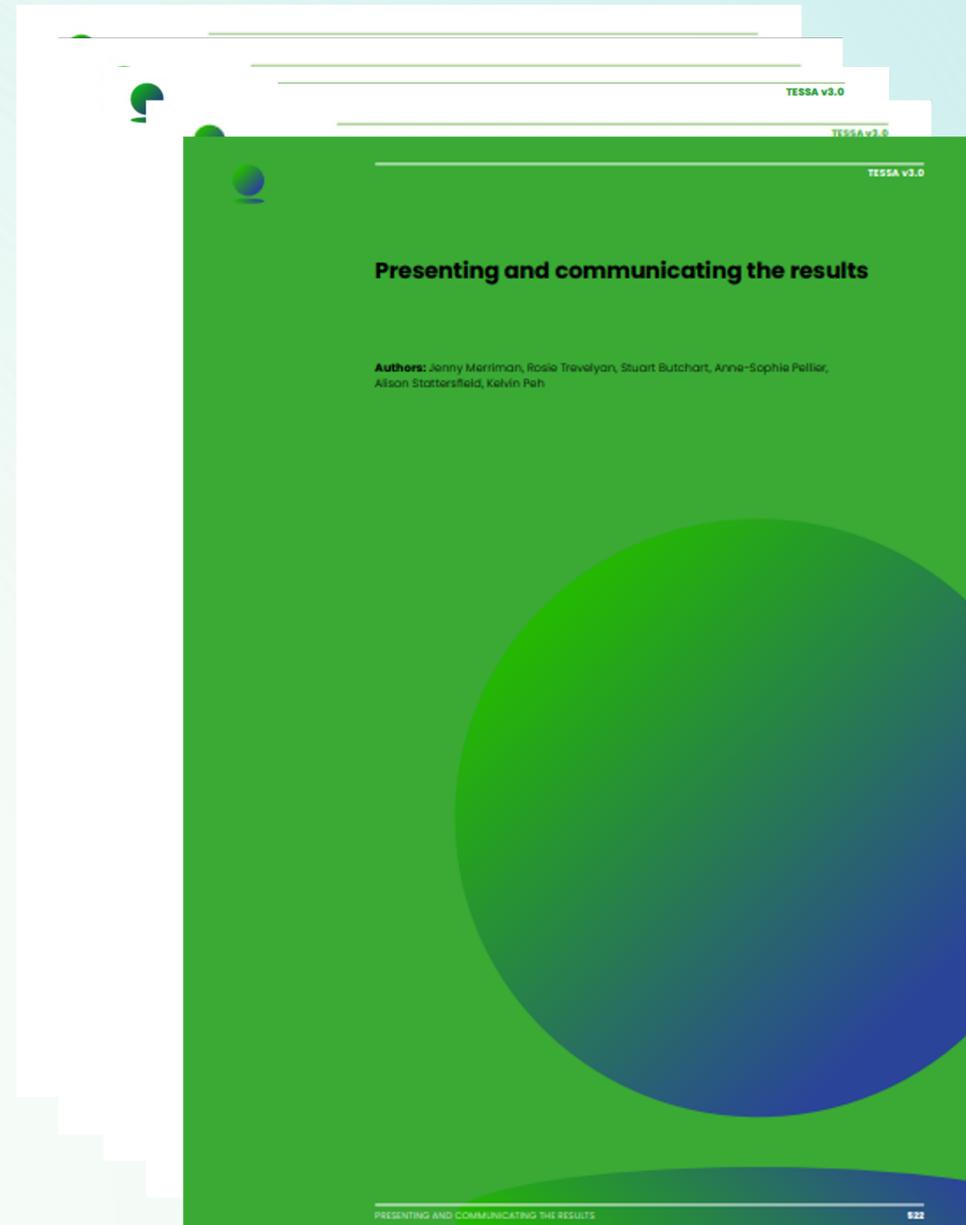
Qualitative +
Quantitative +

Qualitative +
Quantitative +

Quantitative +
+++

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



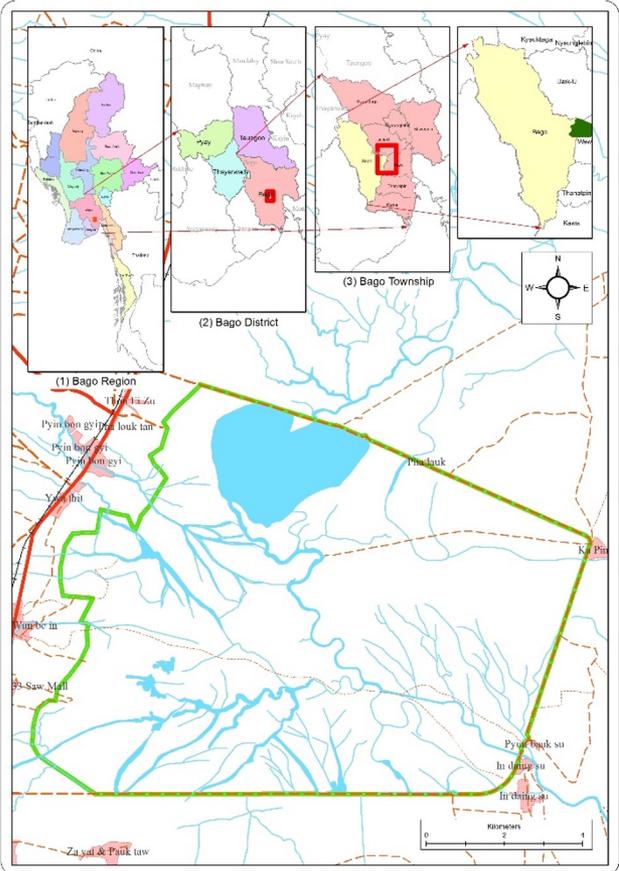
Importance of beneficiaries

- 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

- 

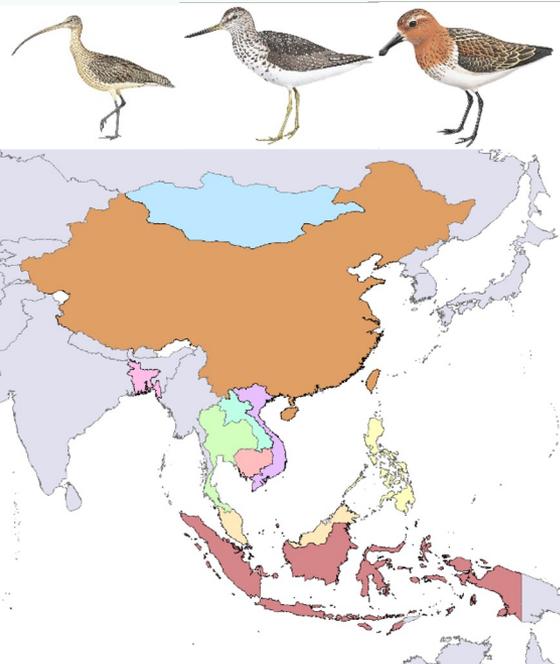
GHG Emission : - \$ 3.1 million/year
 Paddy fields release CO2, Methane and Nitrous which accelerates climate change. The cost of these are \$3,136,000/year.
- 

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

TESSA is a flexible framework

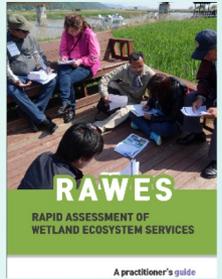
- As simple as possible without losing science
- Use to level of own capacity and knowledge
- Designed to be adapted to suit context
- Encourage feedback and further improvements through new projects
- Welcome “add-ons” and other complementary methods
- RFI as an example:



147 priority sites

ES documentation

- Climate regulation
- Livelihoods:
 - Cultivated goods
 - Harvested wild goods
- Coastal protection
- Water-related services



Recommended documentation for ecosystem services delivered by Key Biodiversity Areas

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

THANK YOU

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

Enquiries: tessa@birdlife.org

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



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