VALUING THE ARC

Linking Science with Stakeholders to sustain Natural Capital

Valuing the Arc (VtA)-Spatial Valuation in the Eastern Arc Mountains, Tanzania

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Ecosystem Services (ES)







- Links nature to human welfare
- Full accounting of costs and benefits
- Conservation could pay for itself?

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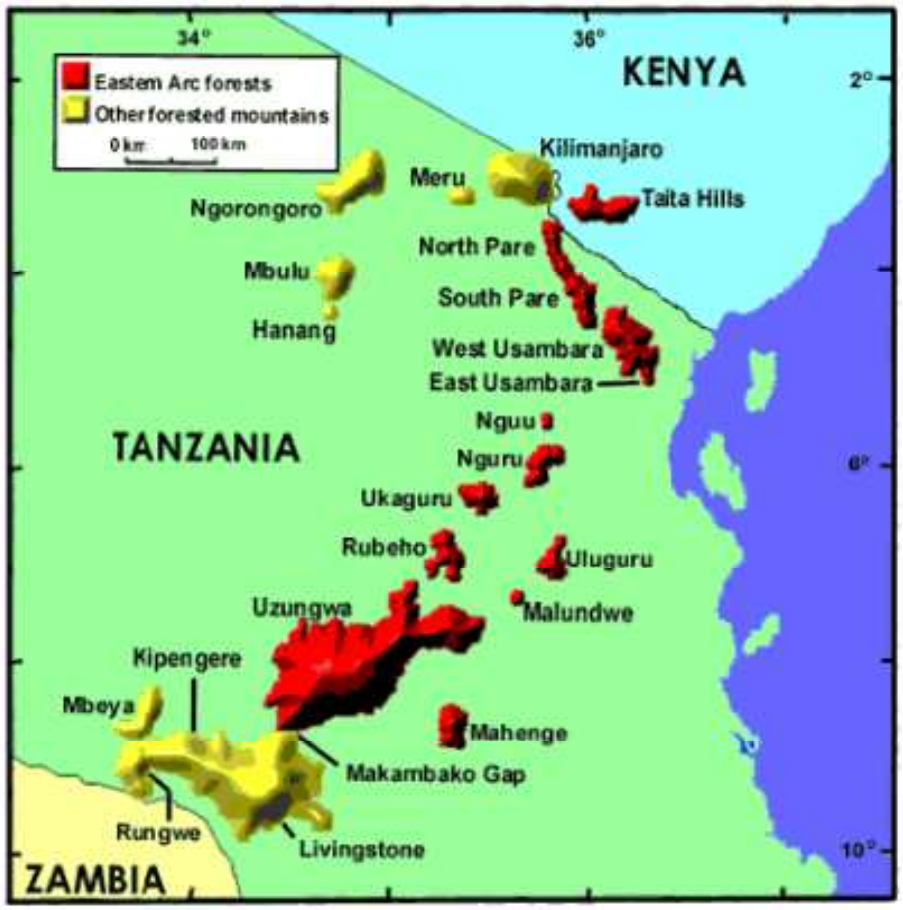
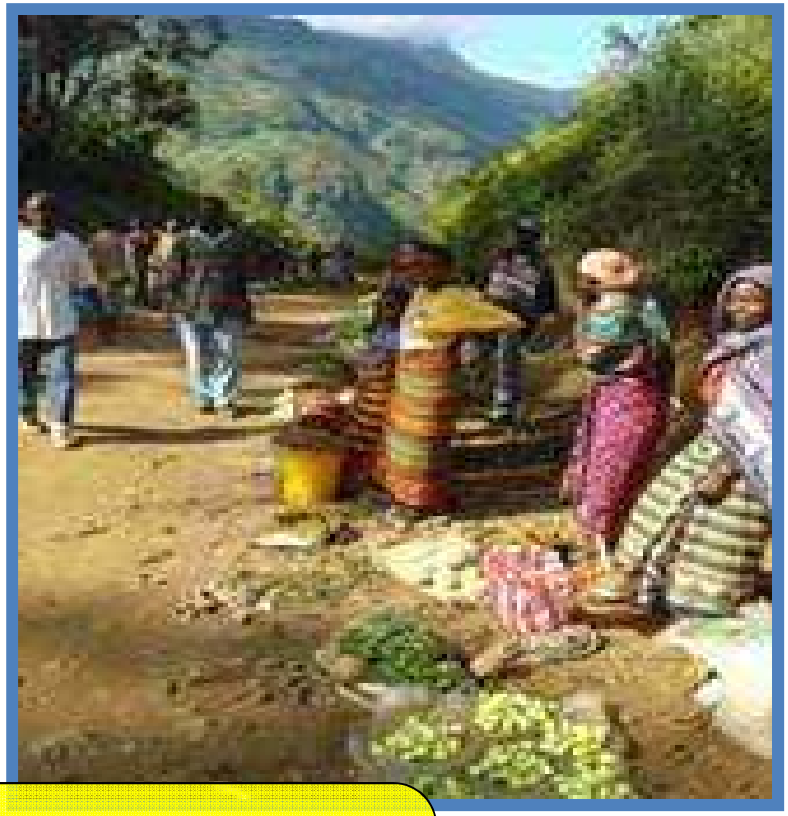
VtA Project Area-Eastern Arc Region

- Holds 30-40% of rare and endemic mammal and plants species.
- It is one of the top 10 Important Bird Areas in Africa.
- Has been categorized among the 34 World Biodiversity Hotspots.
- Provide water for farming, hydroelectric power, and domestic. Provide fuel, food, building materials and medicine.
- ..



Decision-maker questions

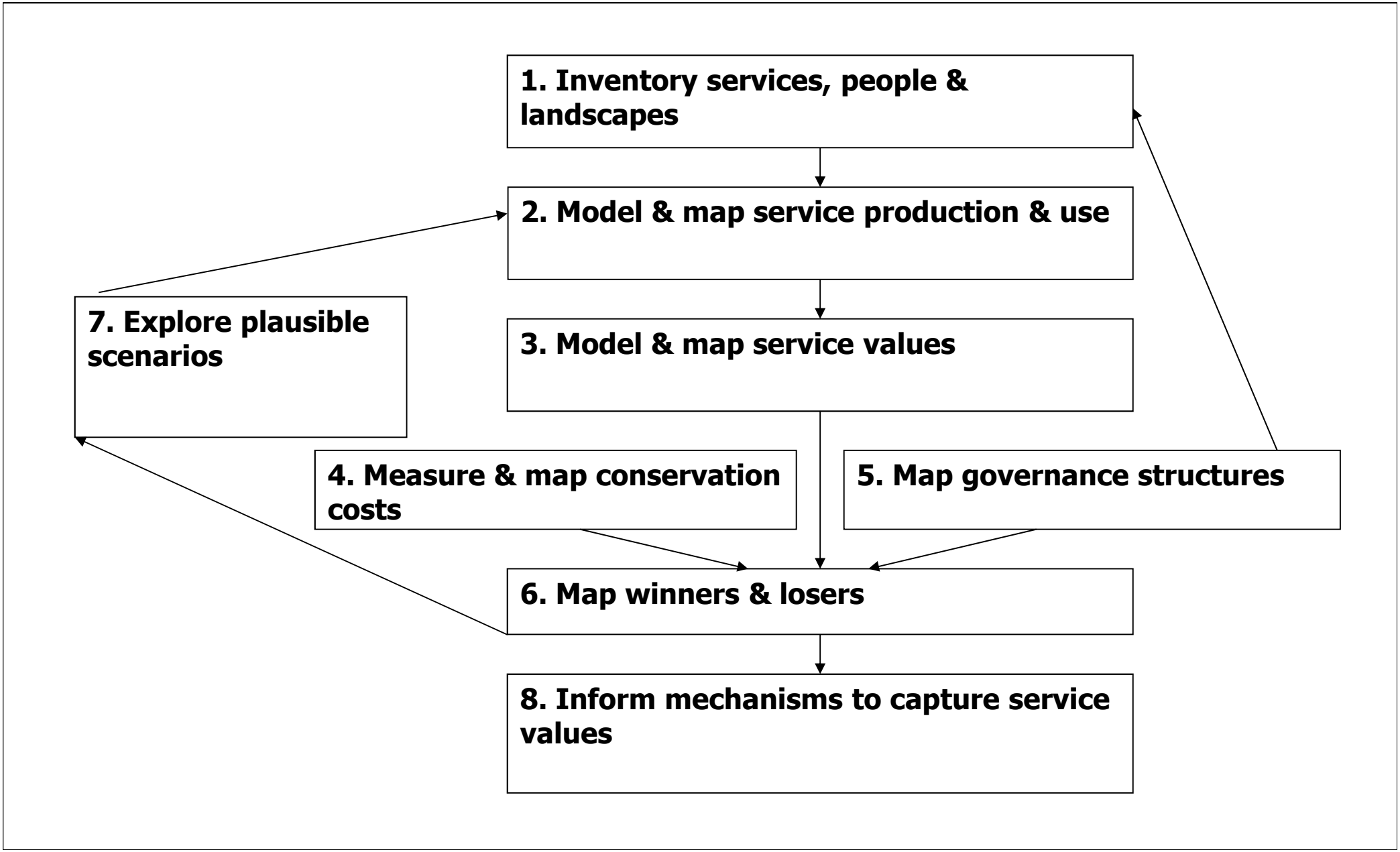
- Where are ecosystem services supplied?
- How would a proposed project affect different ecosystem services and biodiversity?
- What landscape pattern would optimize ecosystem services now and under likely scenarios?
- Who should pay whom under a proposed PES/REDD program, and how to scale it up?



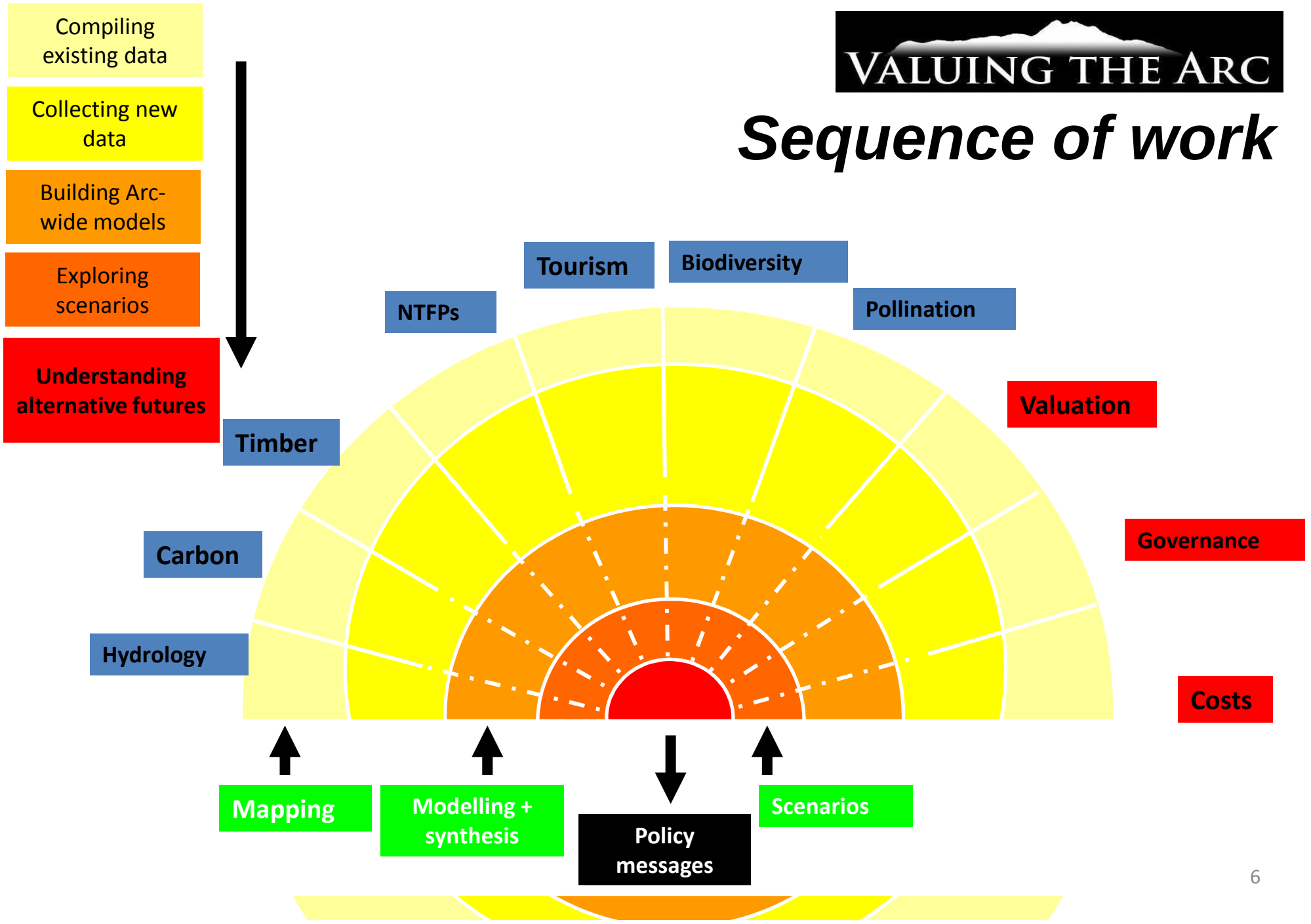
ANSWERS:

landscape-scale, multi-service assessments

The Ecosystem Services Approach



Sequence of work



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Components of service modelling

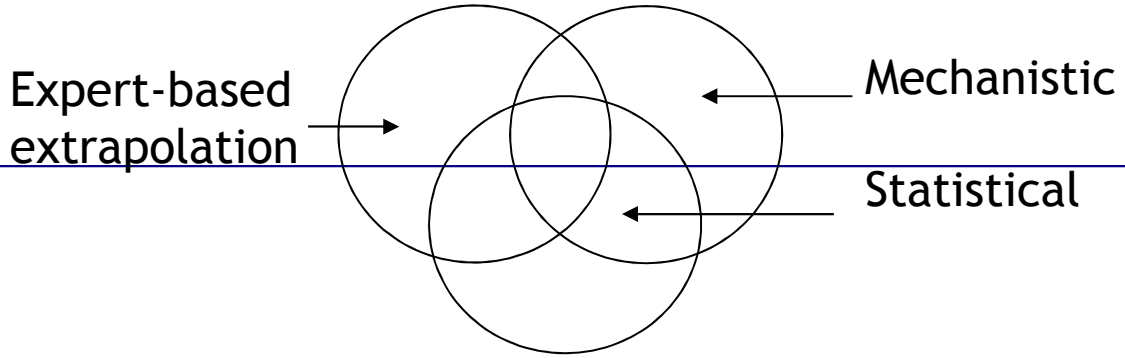
Production →

Flow →

Use →

Value (TSh)

Approaches to service modelling

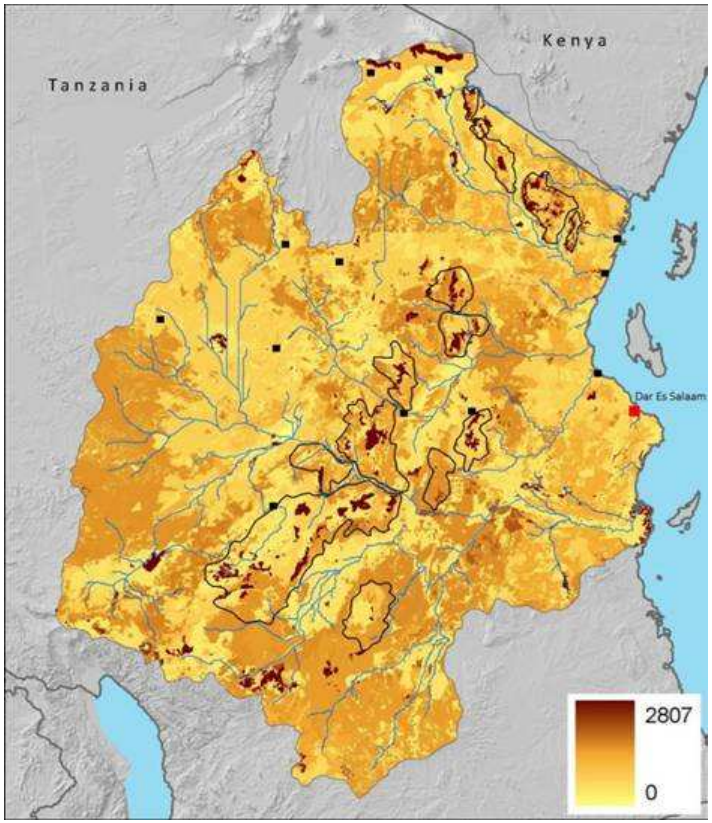


1. How much carbon is stored EAMs?

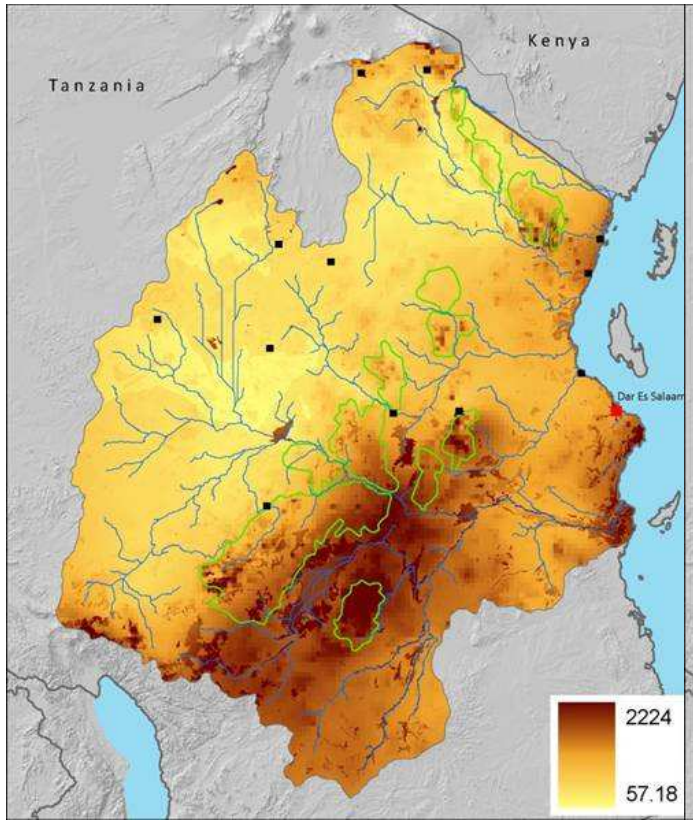
2. *Where are the most important areas for water supply?*

3. *How do priorities for ecosystem services map onto priorities for biodiversity conservation*?

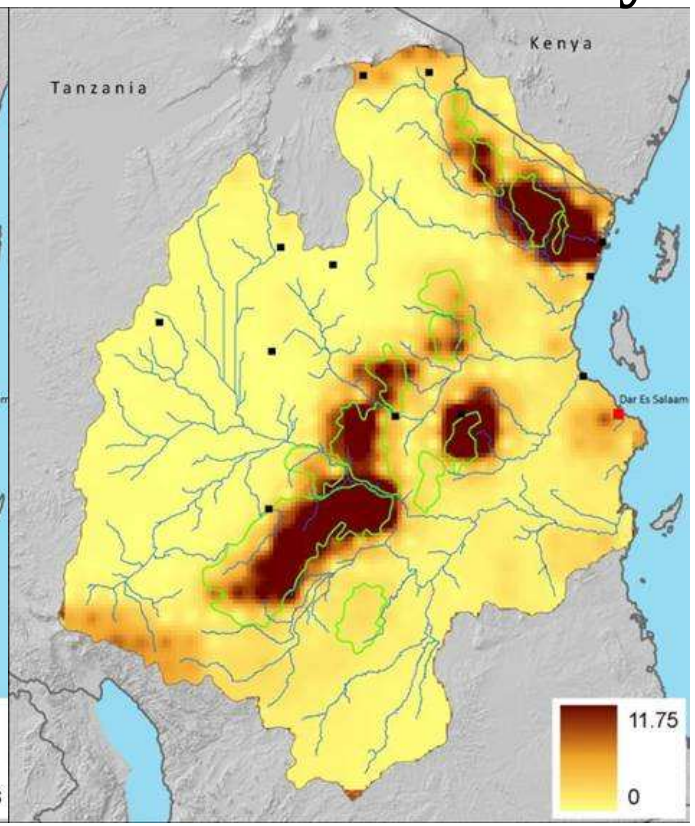
1. Carbon



2. Water



3. Biodiversity



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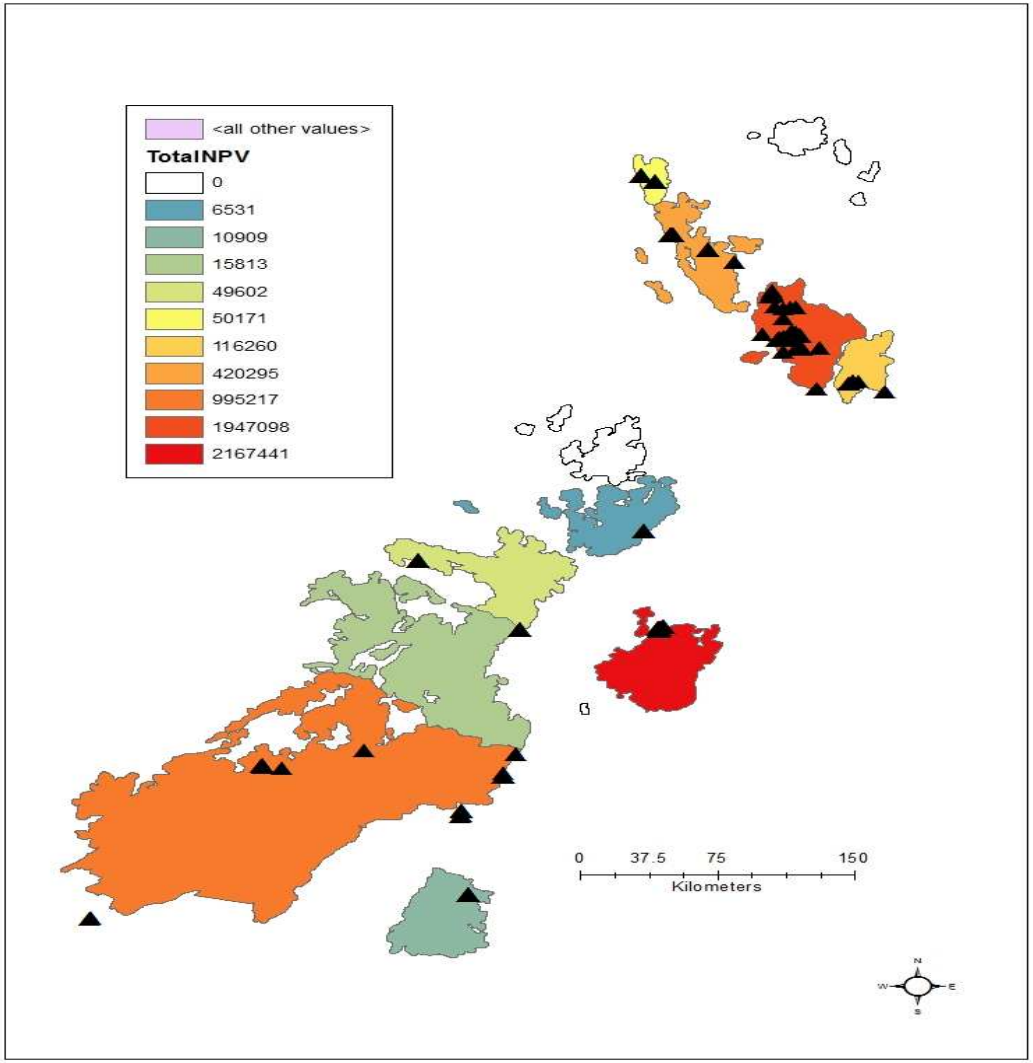
Valuation of Nature based Tourism

- **EAM blocks showing highest (red) to lowest (blue) in terms of US$ value generated by Visitors (Foreign and TZ)**

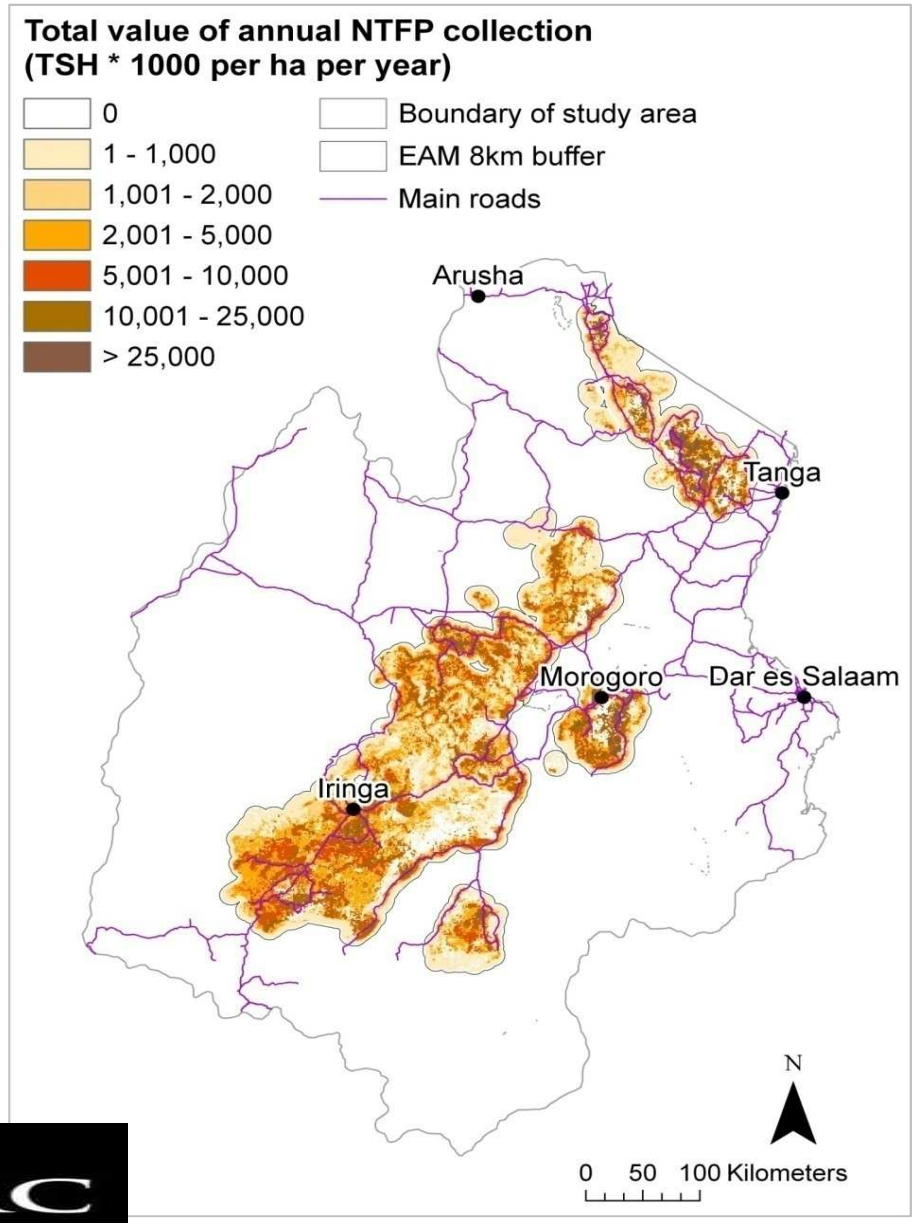
- **Ulugurus have the greatest generation of tourism value followed by the West Usambaras and then the Udzungwas.**



Valuation of NTFP collection in the EAM

Total NTFP value/yr:	**42 million US$**
Firewood:	**25 million US$**
Charcoal:	**15 million US$**

Charcoal production:
11 % of charcoal use in Dar es Salaam, Morogoro and Tanga.



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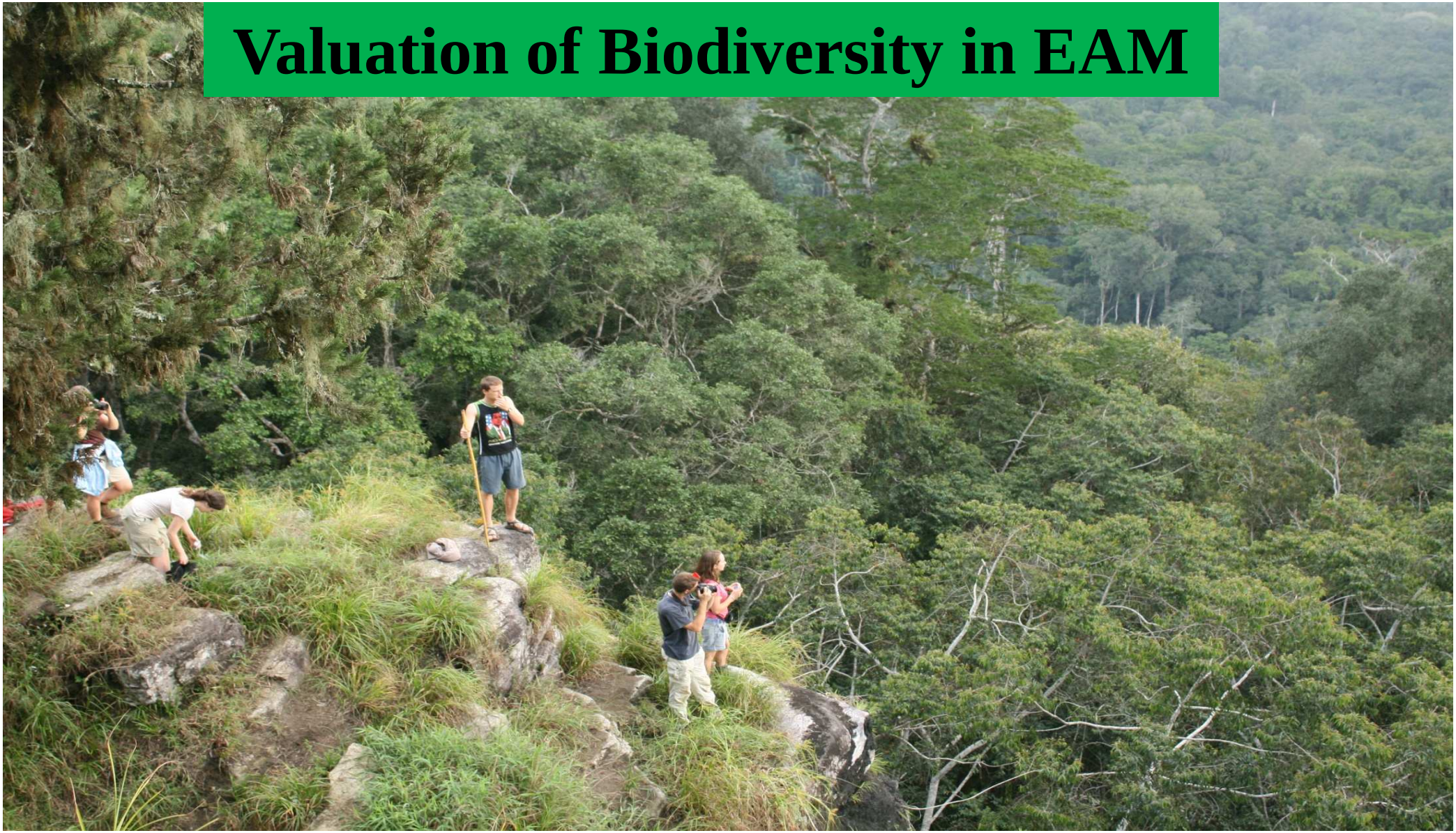
Valuation of Biodiversity in EAM

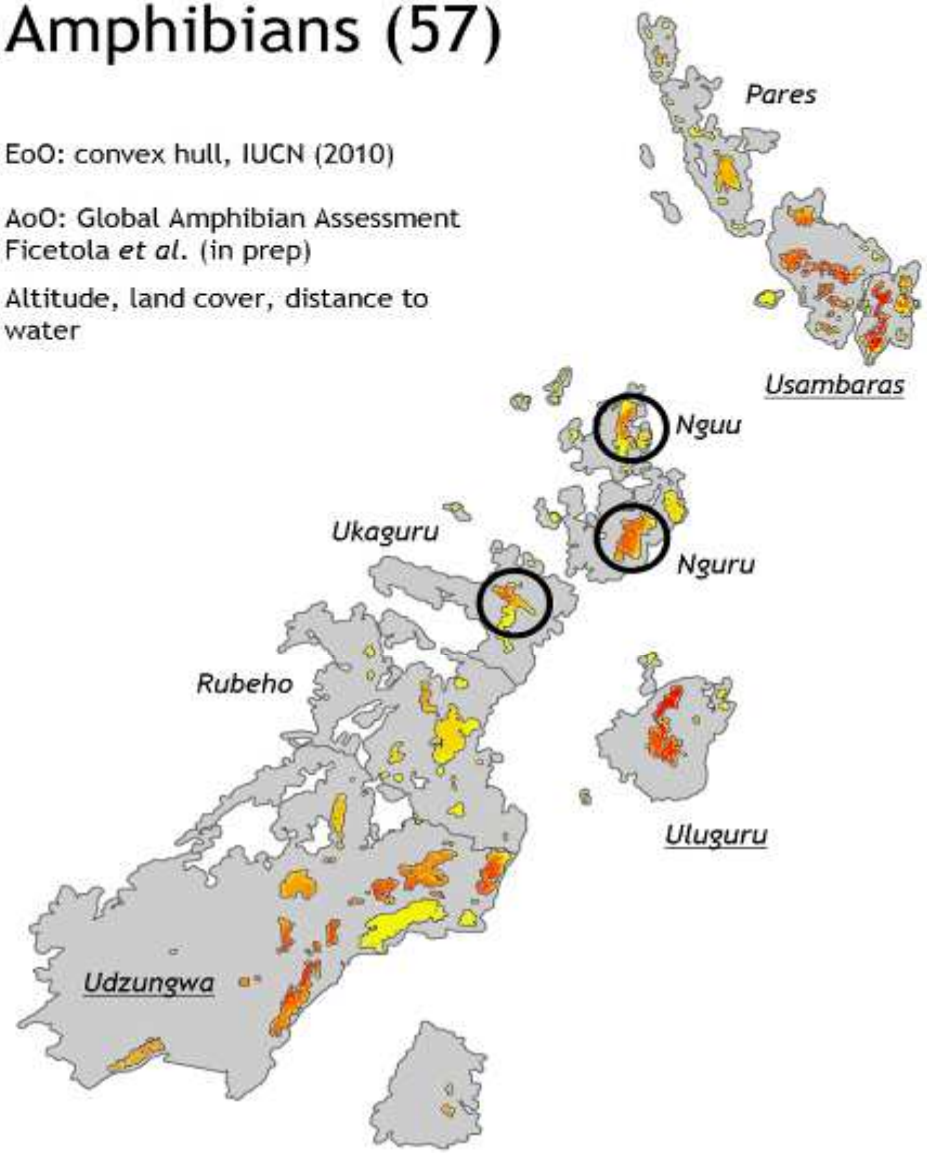


Amphibians (57)

EoO: convex hull, IUCN (2010)

AoO: Global Amphibian Assessment
Ficetola *et al.* (in prep)

Altitude, land cover, distance to water

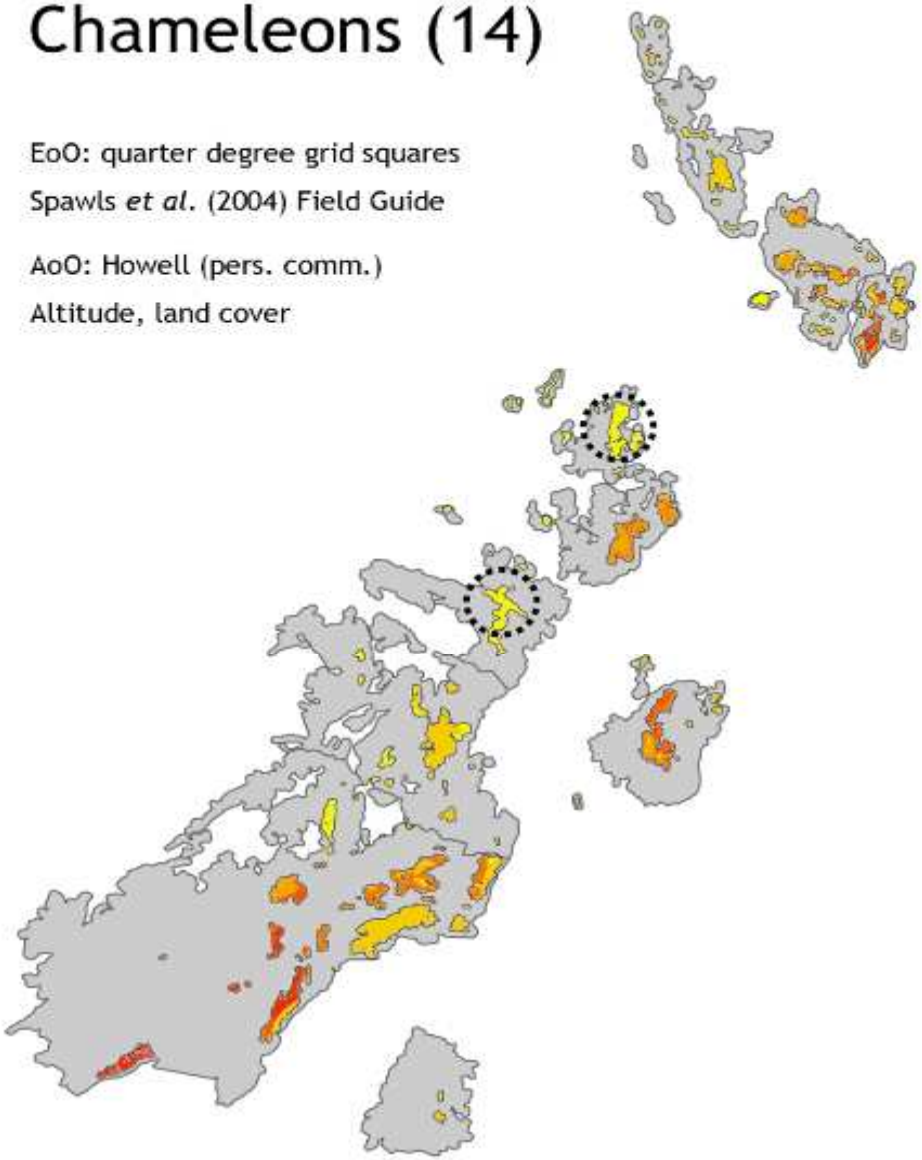


Chameleons (14)

EoO: quarter degree grid squares
Spawls *et al.* (2004) Field Guide

AoO: Howell (pers. comm.)

Altitude, land cover



Low High

Resolution = 100-300 m

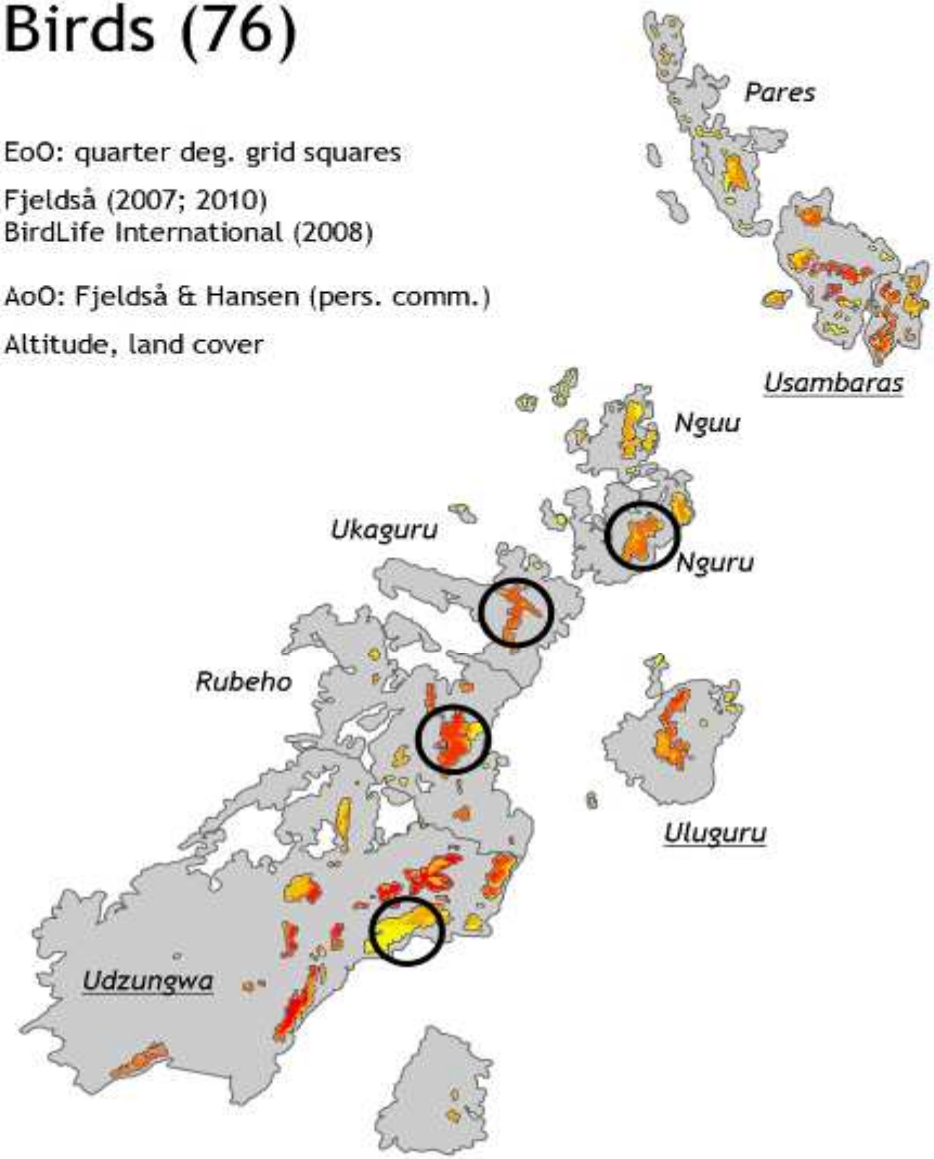
Birds (76)

EoO: quarter deg. grid squares

Fjeldså (2007; 2010)
BirdLife International (2008)

AoO: Fjeldså & Hansen (pers. comm.)

Altitude, land cover



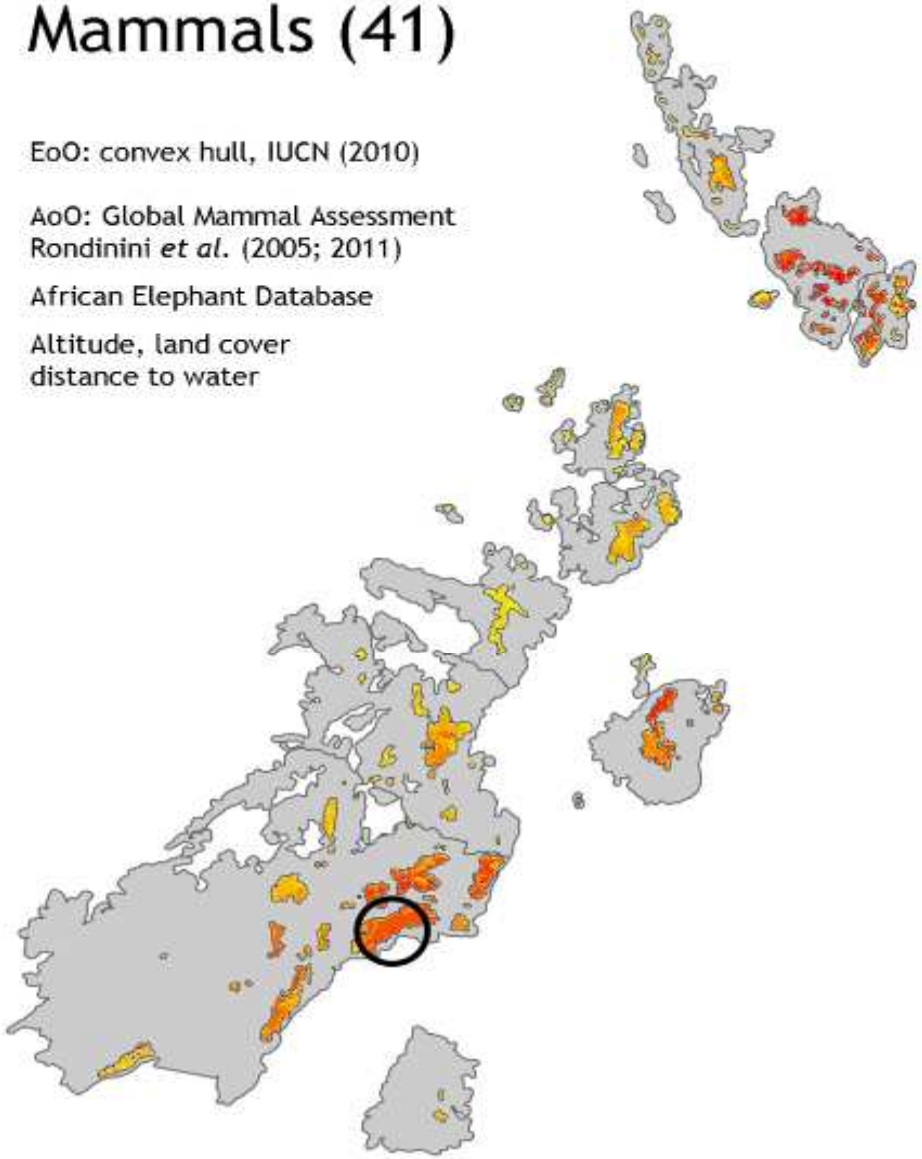
Mammals (41)

EoO: convex hull, IUCN (2010)

AoO: Global Mammal Assessment
Rondinini *et al.* (2005; 2011)

African Elephant Database

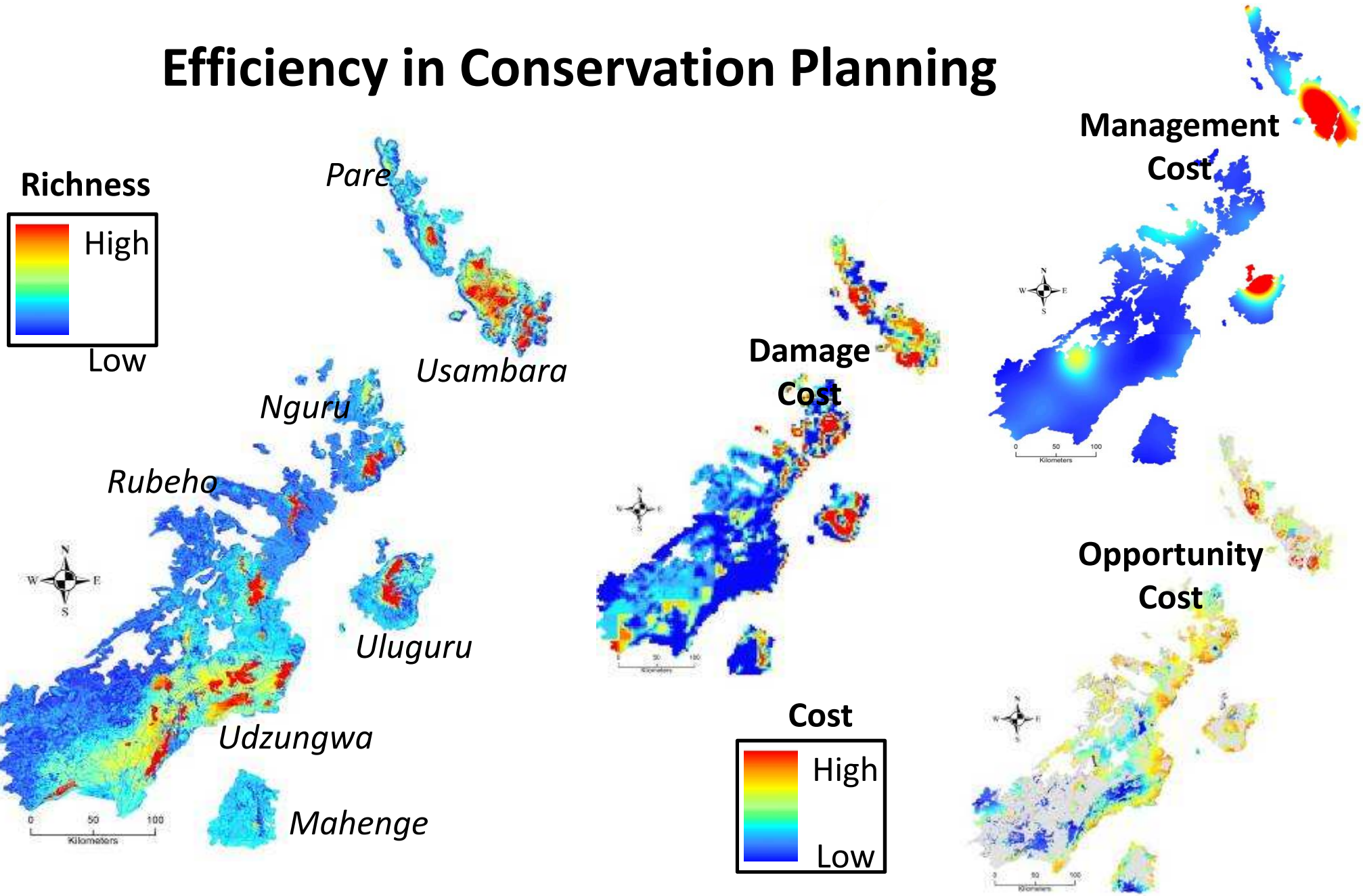
Altitude, land cover
distance to water



Low High

Resolution = 100-300 m

Efficiency in Conservation Planning



Minimise cost, rather than area, to achieve real efficiency

MAPPING AND VALUATION OF CARBON STOCKS

Use 5 pools of Carbon for each land cover

- Aboveground
- Soil Carbon
- Belowground
- Organic matter
- Dead material

Stratified by elevation and cover types

- Evergreen Forests
- Woodlands – Miombo, Acacia
- Thickets
- Cultivated land – mixed crops / agro-forests

Degradation assessed

A Total of 2,500 carbon monitoring PSPs already established

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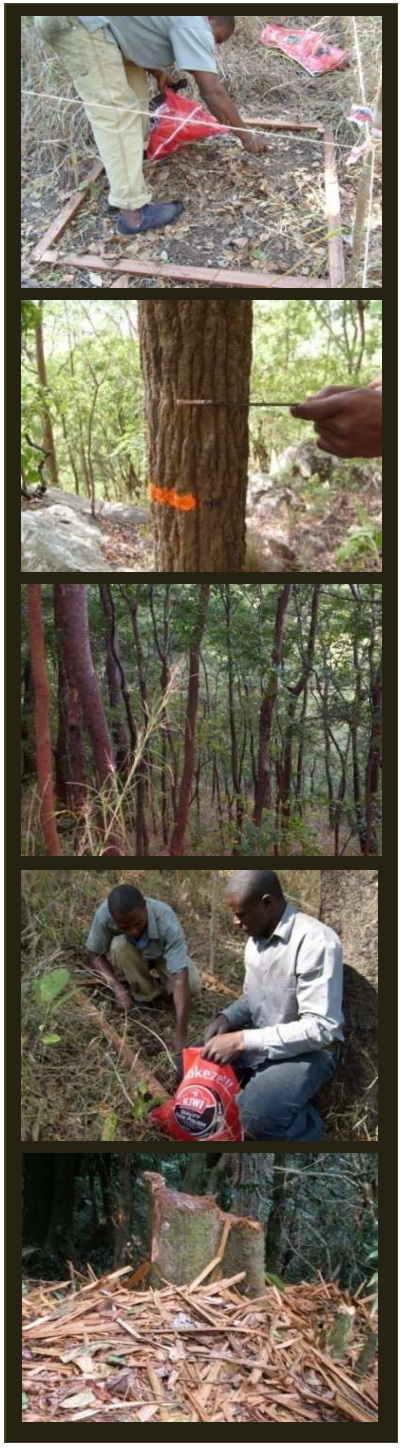

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Relevance to REDD initiatives

- A major element of previous efforts, in Tanzania and elsewhere, is the community forest management.

- This system has delivered reasonably well in term of forest conservation, but the local economic benefits have been small or even negative.

- A key purpose of REDD is to change this, and provide tangible benefits to local communities and households for their conservation efforts.

Crediting forest carbon

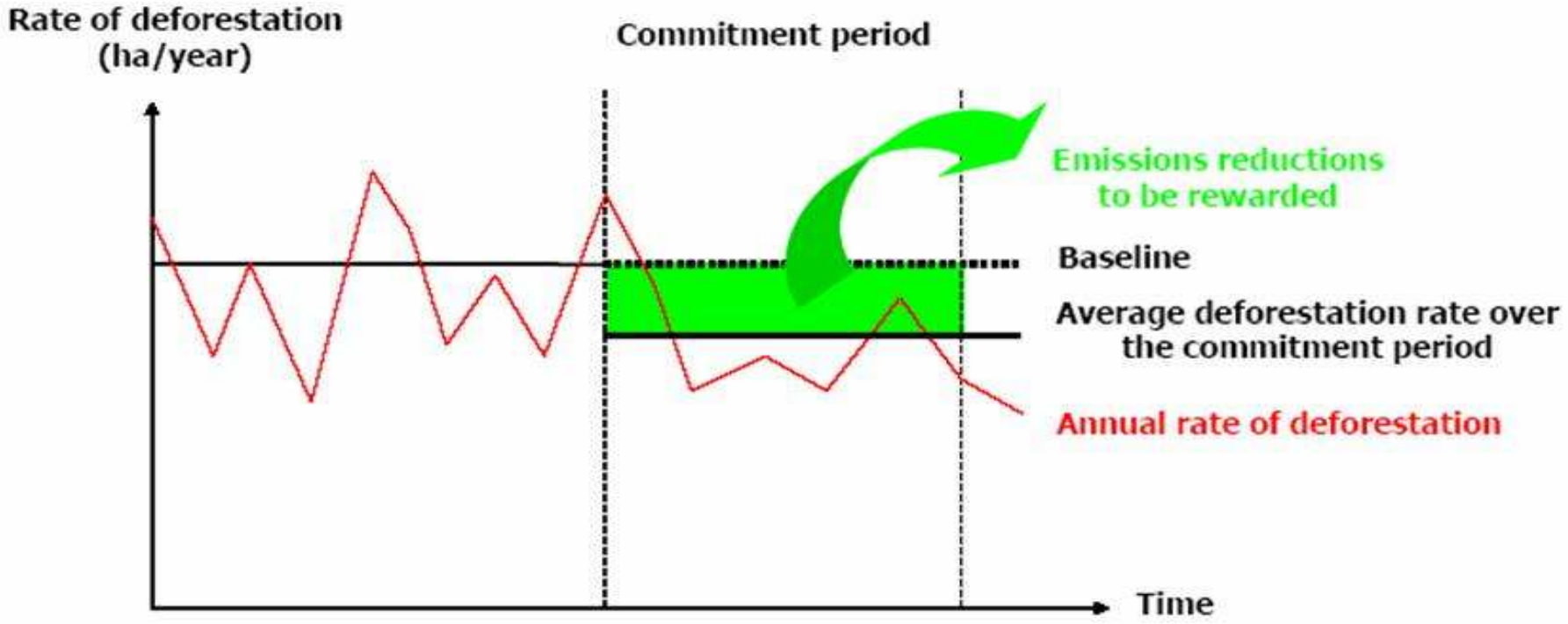
- A key aspect of determining the carbon benefit of any forest carbon project is to accurately quantify the levels of carbon changes to known levels of precision.
- Determination of carbon changes requires baselines
- Possible options for crediting forest carbon management include:

1. **Reduction in emissions from deforestation;**
2. **Reduction in emissions from degradation;**
3. **Enhancement; forest conservation; and**
4. **Conservation of the existing carbon stock.**




REDD is about incetive for avoided deforestation and forest degradation

Figure 18 - The baseline determines how many reductions are to be rewarded



Carbon-related payments for the reduction of deforestation rely on a baseline: during a given commitment period, emissions reductions below the baseline are to be rewarded. In the example above, the baseline corresponds to the historical rate of deforestation before the commitment period.

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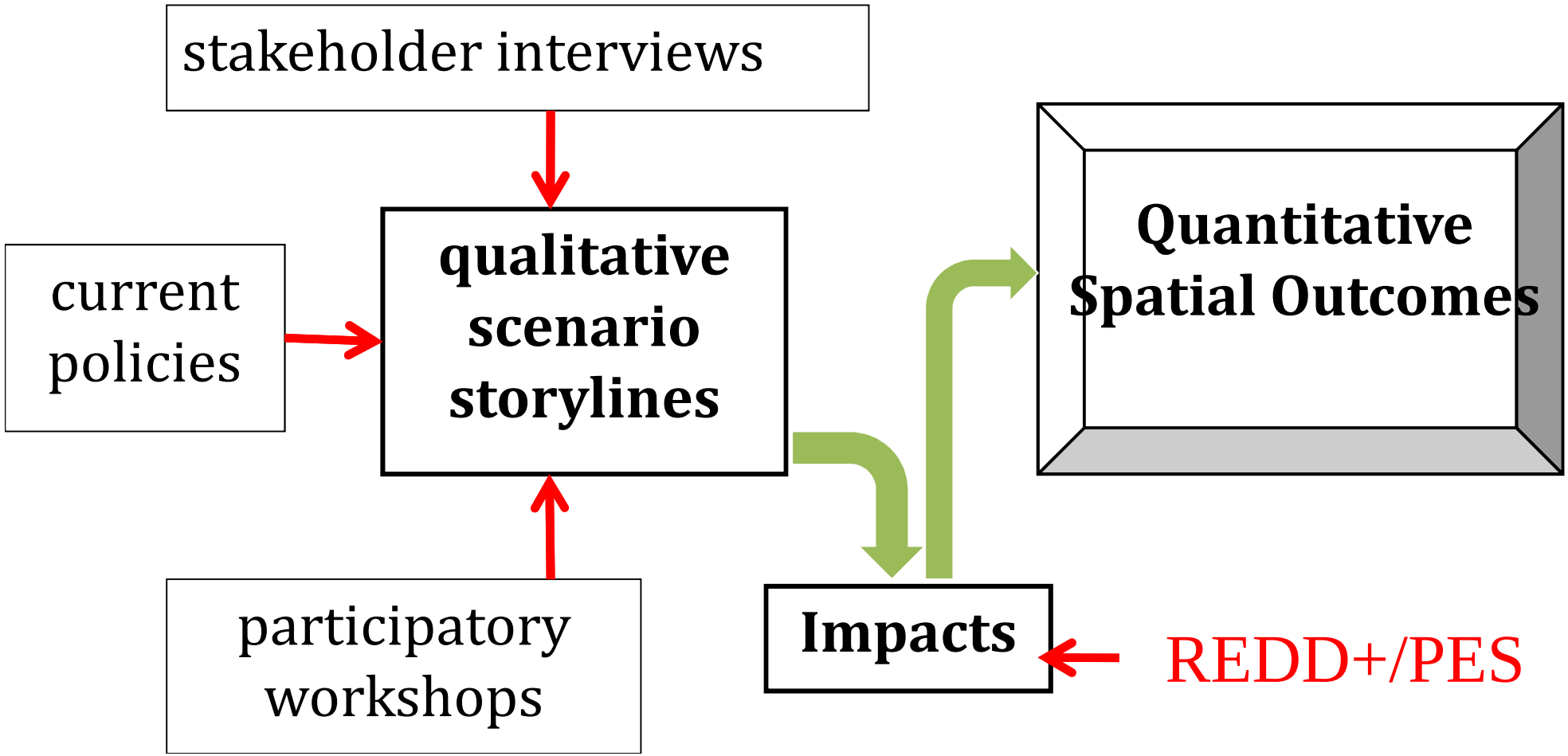
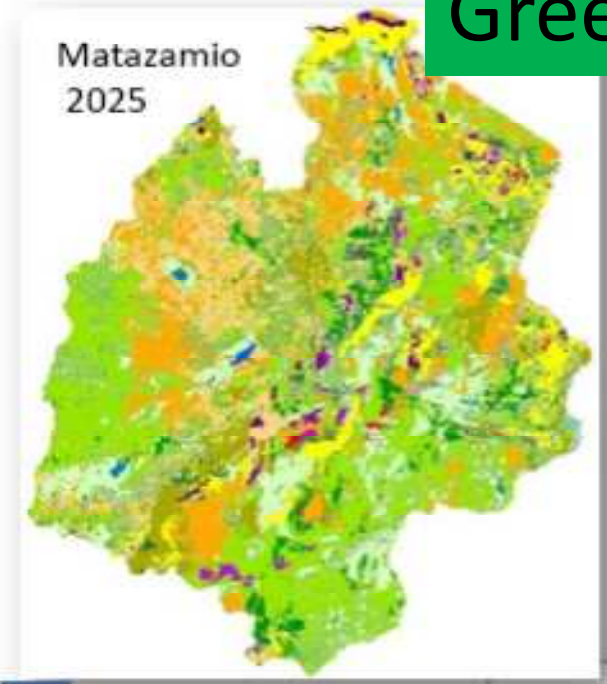
Development of Scenarios

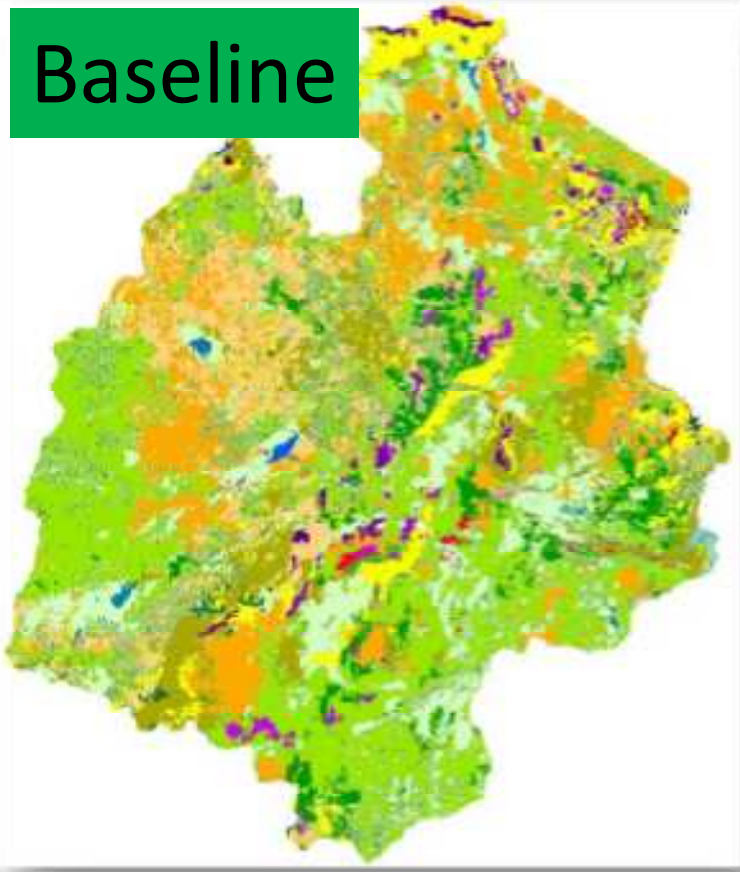
Scenarios are important because the future is uncertain, it evolves driven by complex and interacting factors, such as large scale economic forces…. They are not predictions



Greener Future



Baseline

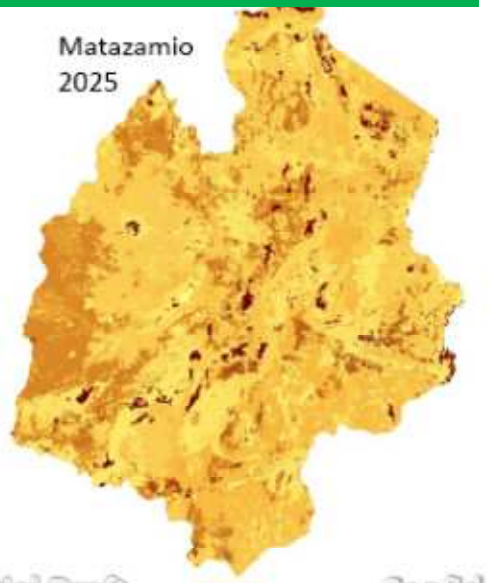


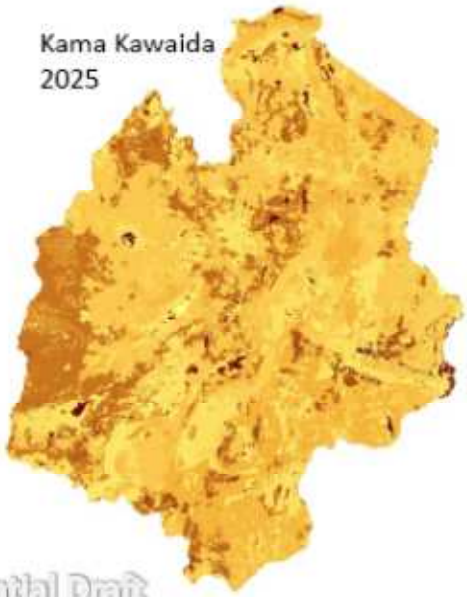
business as usual

Baseline

Greener Future

Busness as Usual





2.86^{9} t/C
2,864,239,183 t/C

LOSS

-3.26^{7} t/C
or **-1.14%** of 2000 value

LOSS

-18.27^{7} t/C
or **- 6.38%** of 2000 value

natural capital PROJECT

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Thank you!!!!