Application of ROAM

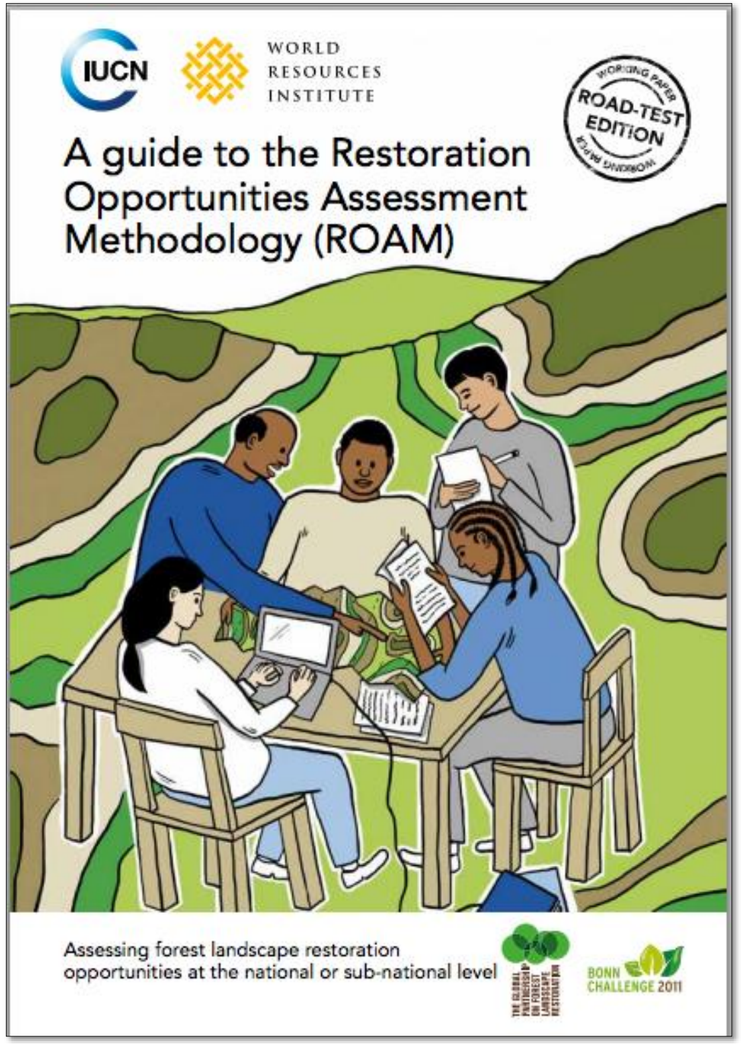
Key aspects of ROAM

- Stepwise, iterative, flexible and adaptable to the Lake Chamo regional context.

- Brings people together to identify, negotiate, and implement FLR activities for restoration.

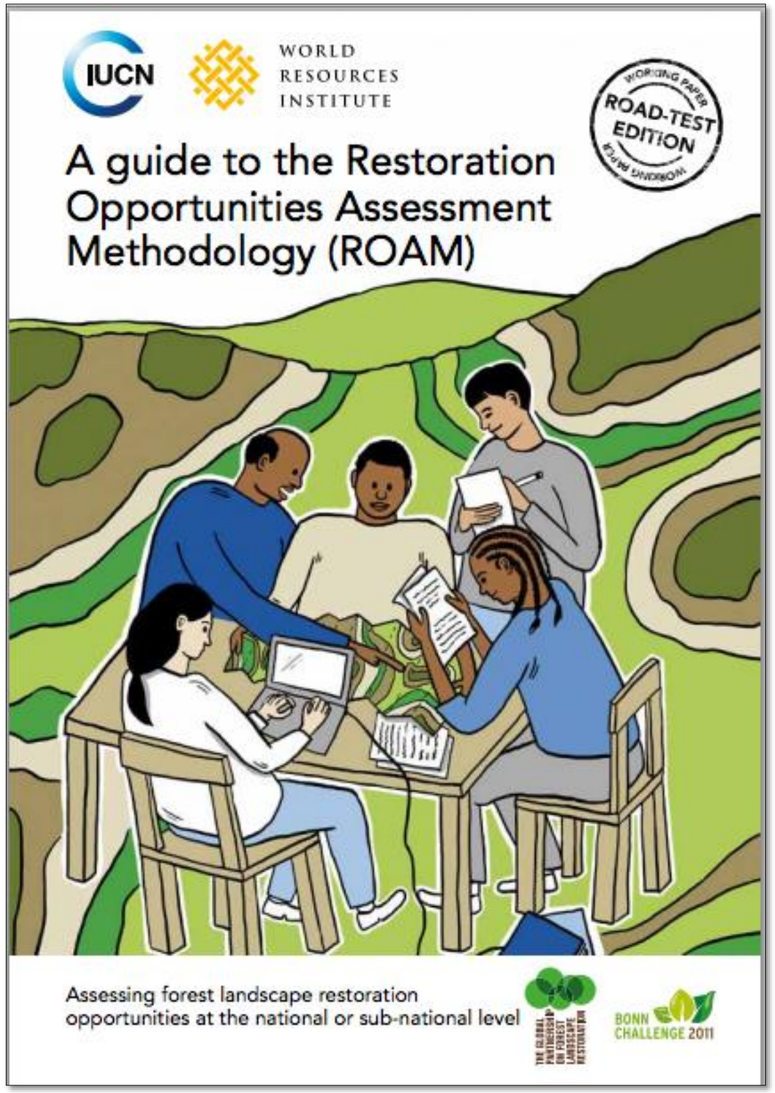
- Generates data, robust analysis, decision support, tools

- Demand driven – ownership – capacity development



ROAM helps you answer the following questions:

1. Where is restoration socially, economically and ecologically feasible?
2. What is the total extent of restoration opportunities in the region?
3. Which types of restoration are feasible in different parts of the Chamo basin?
4. What are the costs and benefits, including carbon storage and ecosystem services, associated with different restoration strategies?
5. What policy, financial and social incentives exist or are needed to support restoration?
6. Who are the stakeholders with whom we need to engage?
7. What options exist to unlock finance for restoration?
8. How can we scale up restoration?

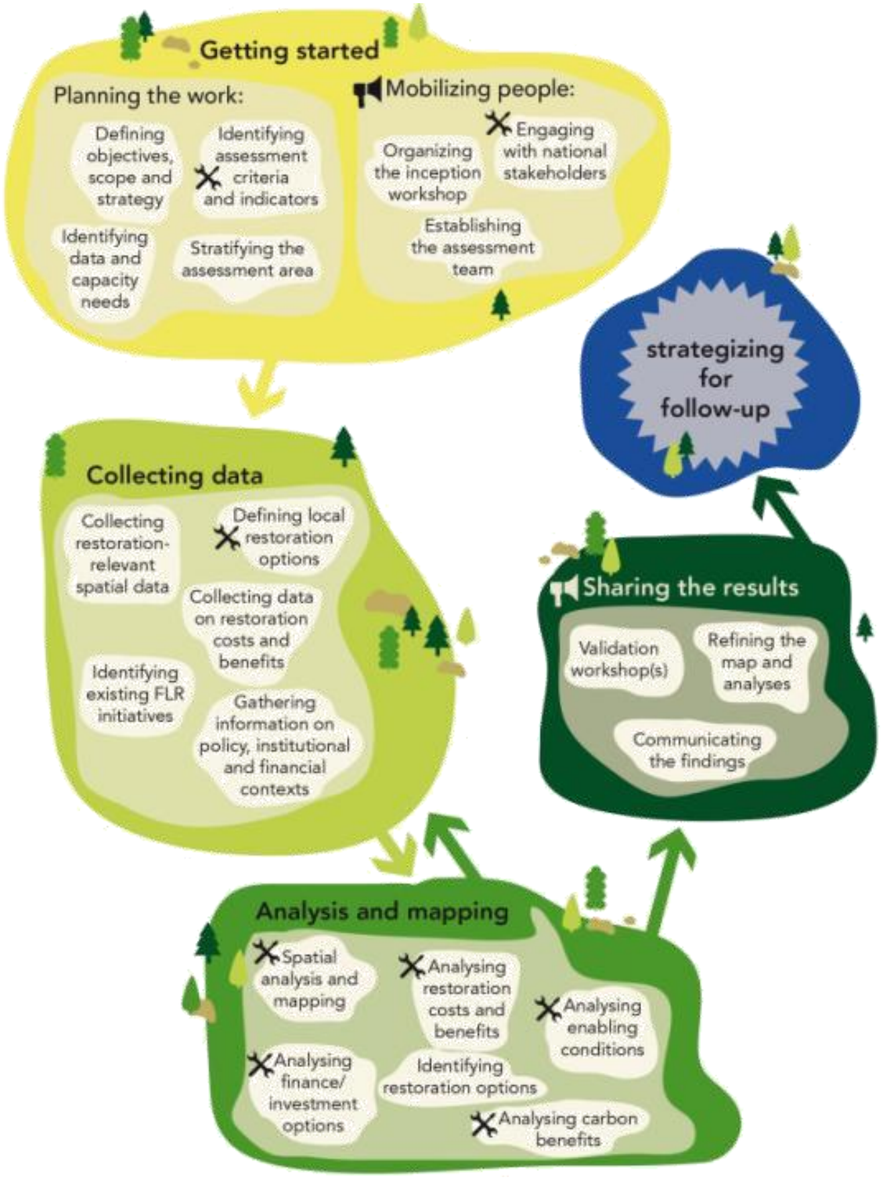


Roam process

1. Preparation and Planning for FLR
   - Stakeholder coordination and support

2. Data Collection and Analysis
   - Spatial analysis and mapping
   - Benefit and cost appraisal
   - Carbon abatement costs and accrual
   - Restoration diagnostic

3. Results and Recommendations
   - Validation of results
   - Identification of restoration and investment options



Key components of ROAM

- Drivers of degradation and objectives of FLR
- Stakeholder mapping and engagement
- Stocktaking of past successes and challenges
- FLR opportunities, priorities and transitions
- Economics, ecosystem services, and finance analysis
- Social/Cultural aspects of FLR
- Data collection and spatial analysis
- Development of FLR action plan and finance strategy
- Stakeholder ownership and validation

Data Collection Templates

Summary

Context (background information)

Resilience (impacts from the climate change and natural hazards)

Gender

Livelihoods

Food Security

Development (assessing socio-economic-environmental impacts)

Business models (agriculture and forest-based business enterprises)

Enterprise budgets (examples)

Generic costs (examples)

Costs of seedlings (examples)

Policy and Institutions

Culture

Financing (community finance)

Stocktake (field data)

Prioritization (degradation and thematic areas)

GEODATA -Physical/Ecological

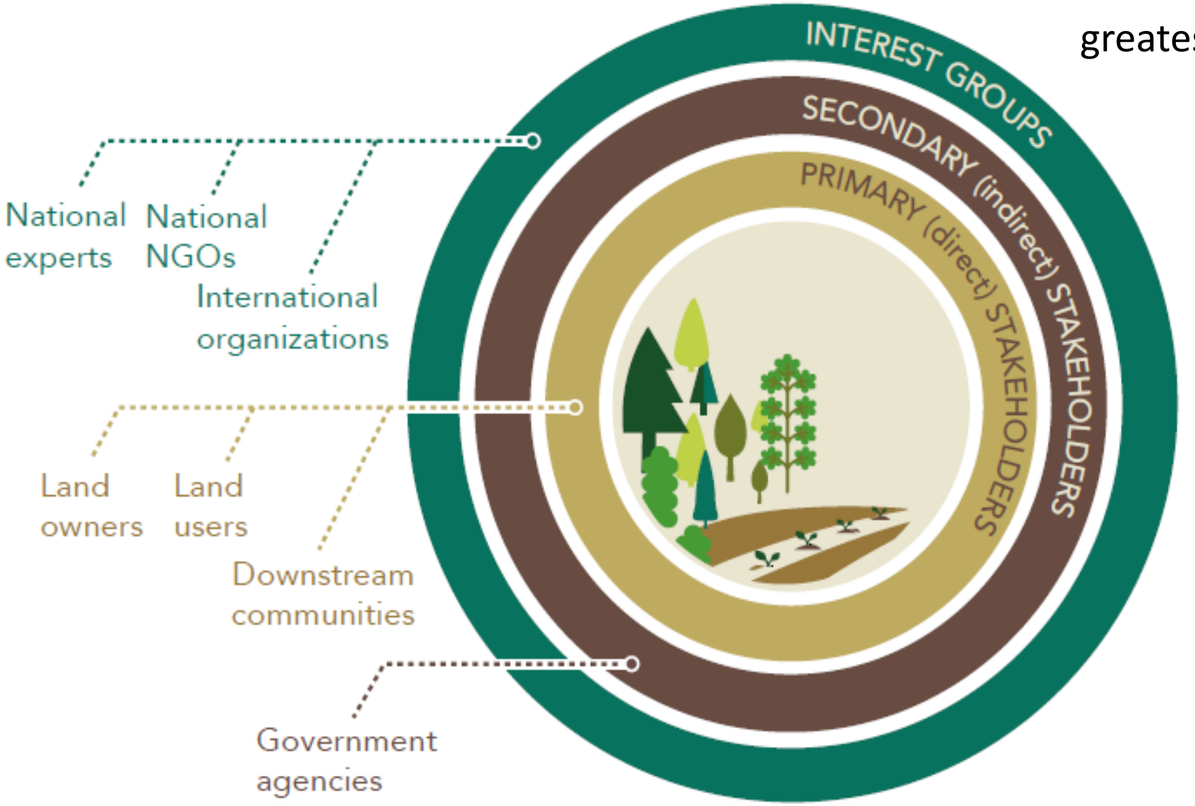
GEODATA-Social

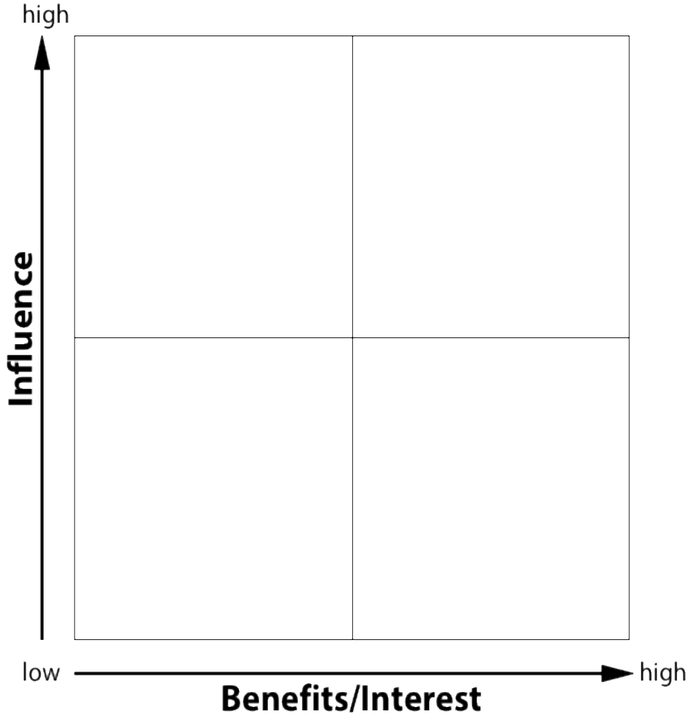
GEODATA-Policy and Legal

Stakeholder Mapping

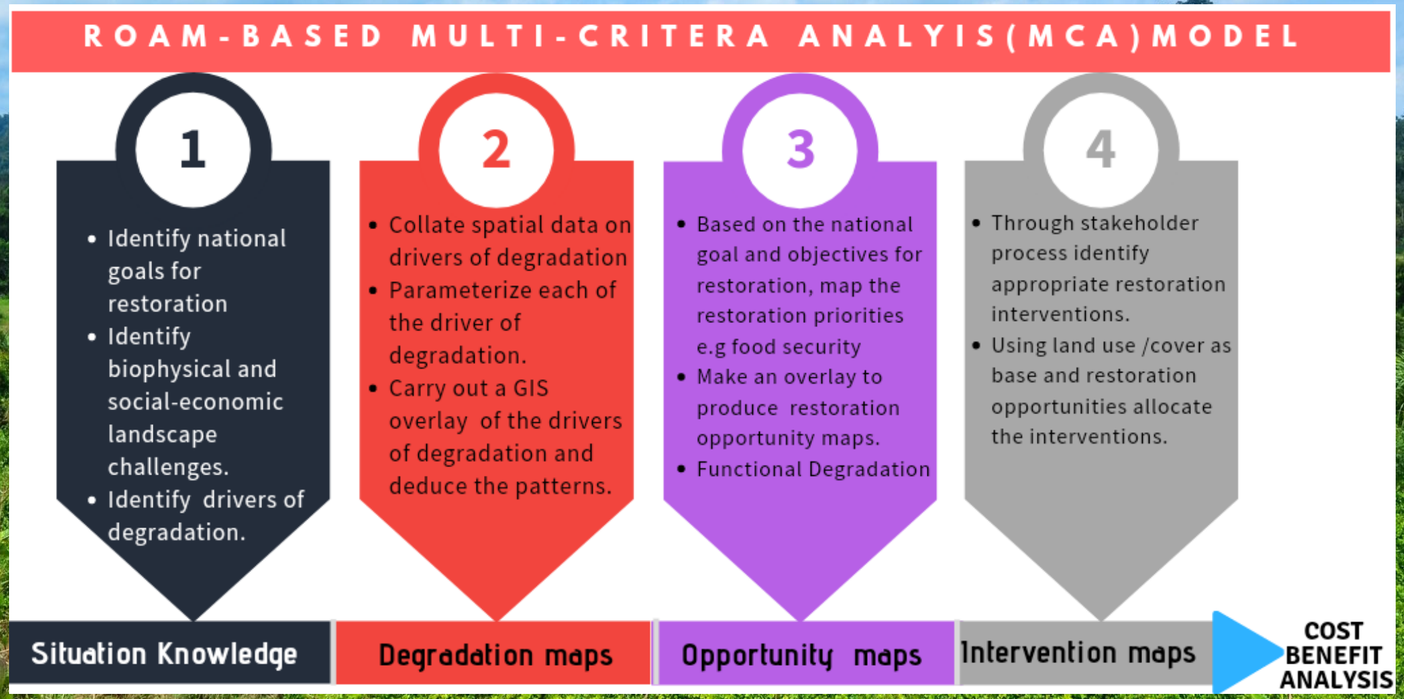
1.Which of the stakeholders listed have the most direct influence (positive or negative) on the outcomes of the FLR assessment and activities? Which stakeholders will have the least influence? Who will be making the decisions?

2. Which stakeholders will have the highest interest or see the greatest benefits from FLR activities?

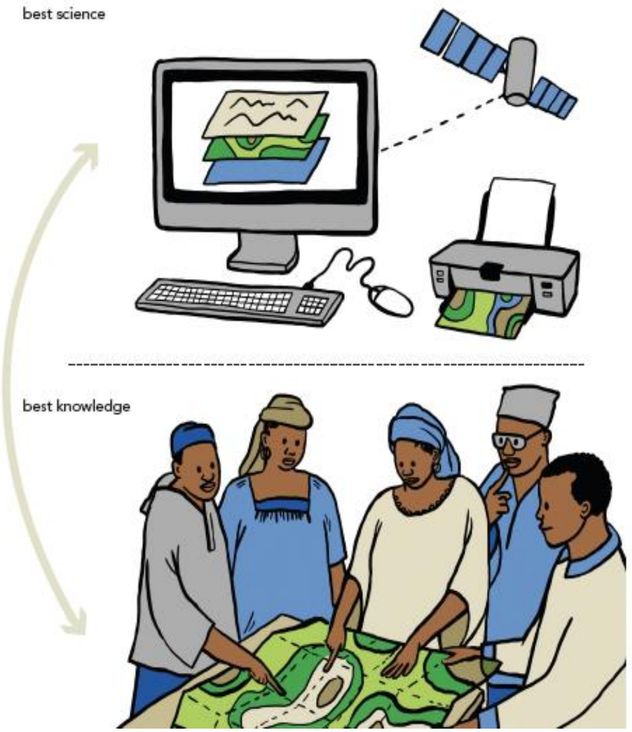




Multi-Criteria Spatial Analysis



- **Objectives of Spatial Analysis**
- **ROAM Spatial Data Analysis Protocol**
- **Expected Outputs**



The Objectives of Spatial Analysis

This **analytical** process should yield:

1. Areas for potential restoration interventions within degraded land in the assessment area;

2. National or sub-national maps of identified and/or prioritized restoration opportunities; and

3. Data that will be useful in other aspects of the ROAM assessment and future monitoring and evaluation

Examples

- Low biodiversity & Loss of primary forest
- High rates of erosion reduce hydroelectric efficiency and reduce water quality
- Agricultural productivity is poor and below potential
- Poverty is high and vigorous private sector is missing

Forest	Energy	Water	Food
Increase forest cover to 30%	*Electricity to 70%*	*100% access to clean water*	*Agri production to 2600 kcal/day*
Economy *Poverty level to 20%* *Per capita GDP to US$1,240*			

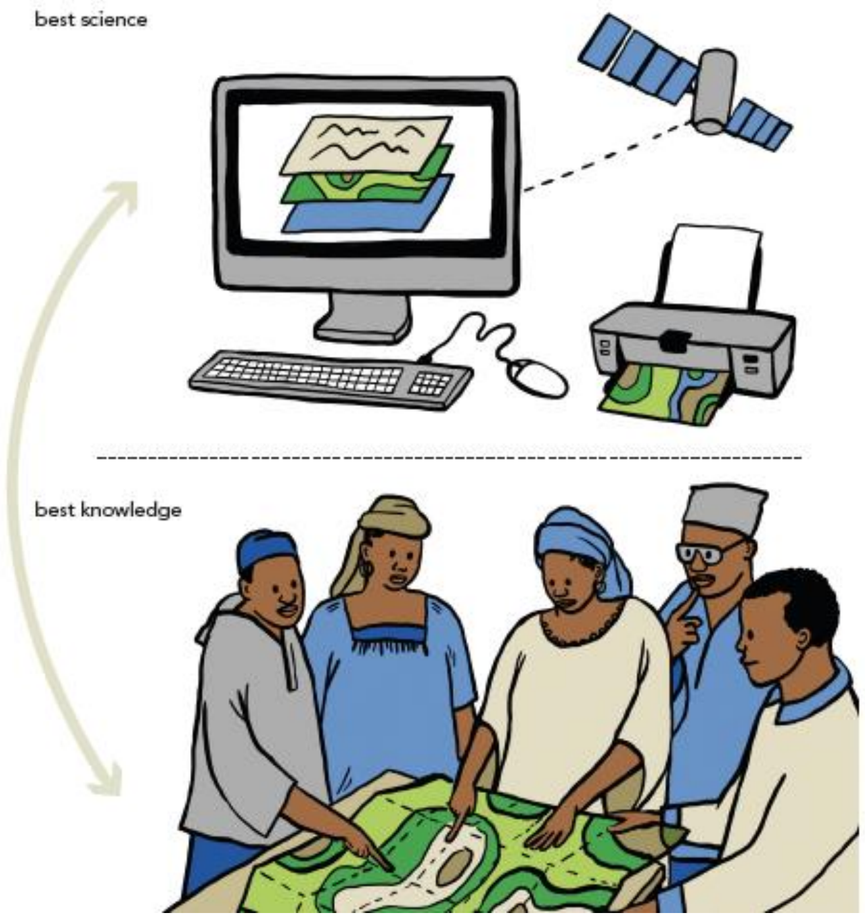
Expected outputs

ROAM assessment should produce a spatial analysis including a series of national or sub-national restoration opportunity maps:

1. Degradation Maps
2. Functional Degradation Maps
3. FLR Opportunity
4. Intervention Maps

It should also produce actionable intelligence on landscape trends, including:

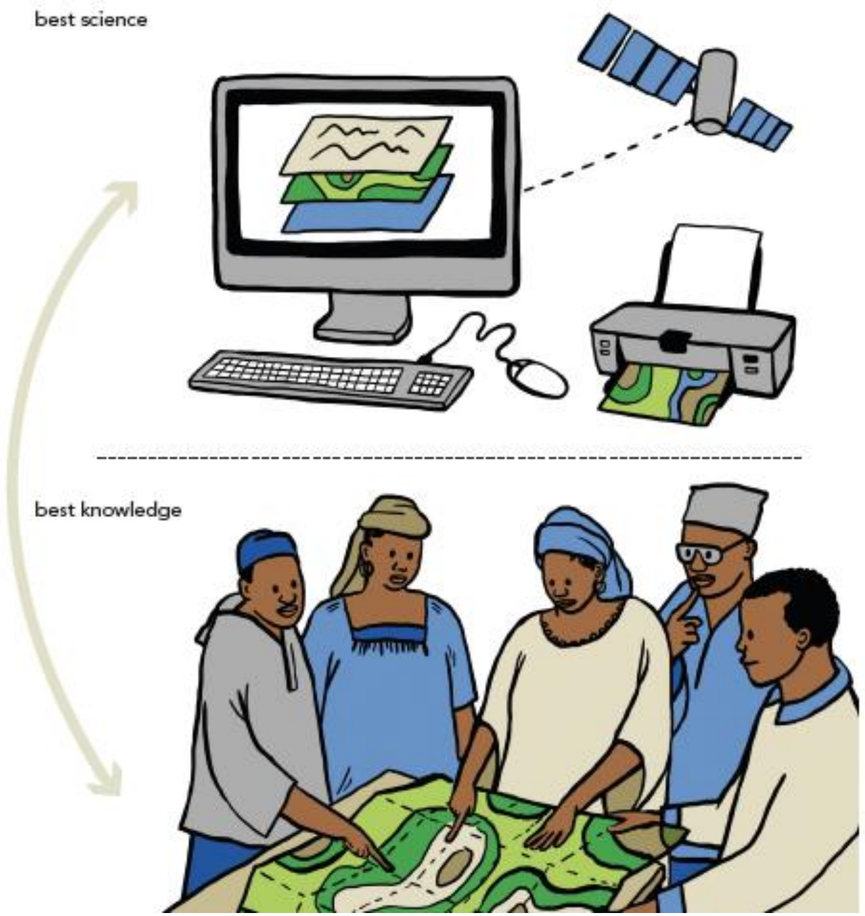
1. Ecosystem services
2. Restoration priorities
3. Decision unit aggregated data



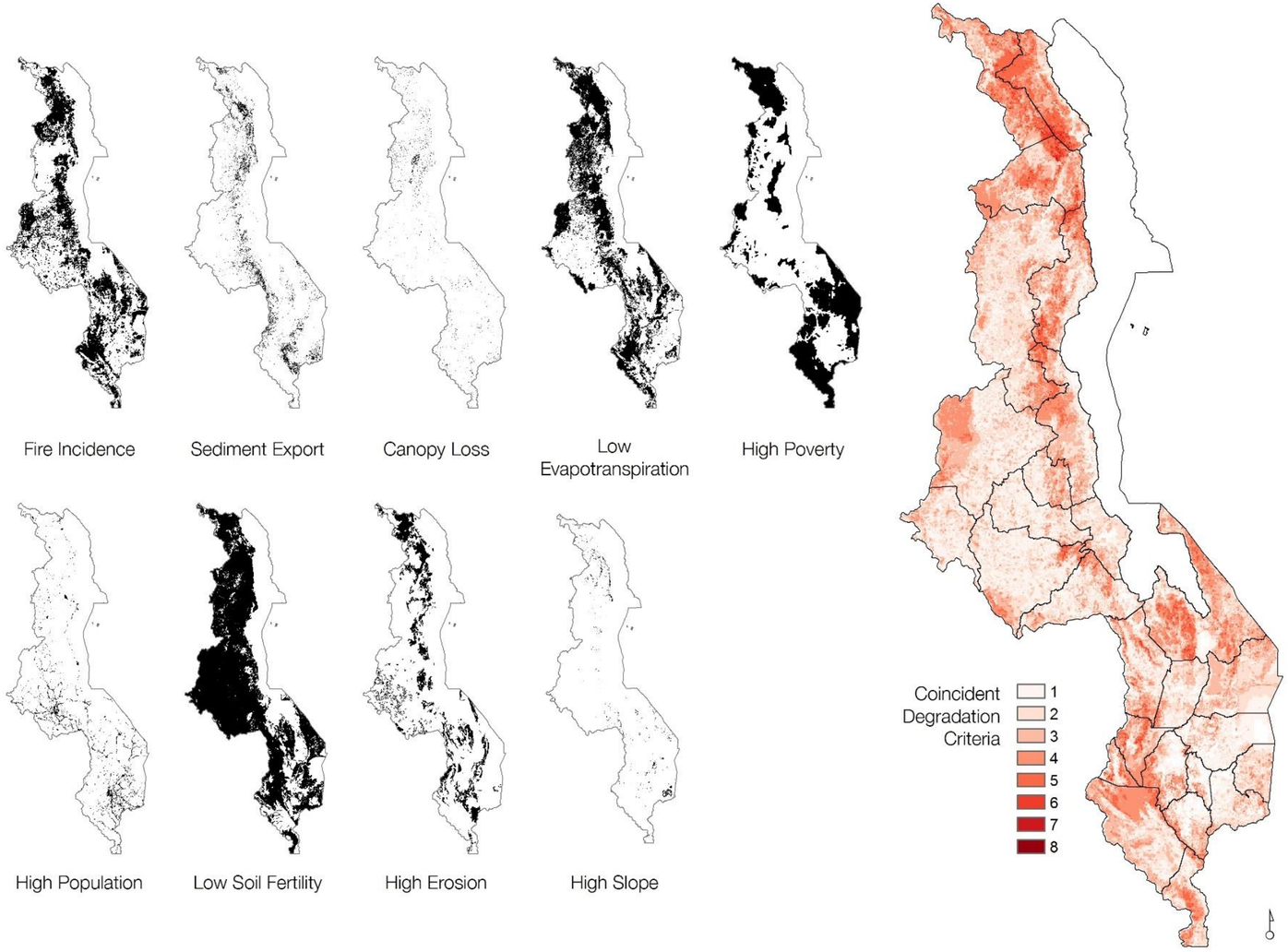
Spatial Data

Table 12.
Potentially relevant data sets for a ROAM application

Issues	Potentially relevant data
Physical and ecological	Geology, soil conditions, rainfall, slope, current land cover, historical land cover, land degradation, flood risk zones, deforested areas, fire resilience, biodiversity hotspots, endangered species ranges, protected areas, water quality, forest species richness, stand density, endangered ecosystems (Red Listed), crop yield data, timber growth data
Social and economic	Current land-use, agricultural plantations, forestry concessions, mining concessions, no-go zones, community conservation areas, certified forestry operations, land ownership, population density, population change in forest areas, poverty levels, community-managed forests, gender-differentiated management, effectiveness of protected areas, sacred forests, ethnic groups, economic costs of different restoration options, profitability of community forestry enterprises, productivity gains from agroforestry, market prices of relevant goods and services, management practices for each restoration intervention
Policy, legal and institutional	National climate change mitigation, adaptation strategies, conservation policies, restoration policies, forestry development policies, agricultural development policies, statutory and customary land and resource rights, major infrastructure programmes, development corridors, existing major restoration initiatives

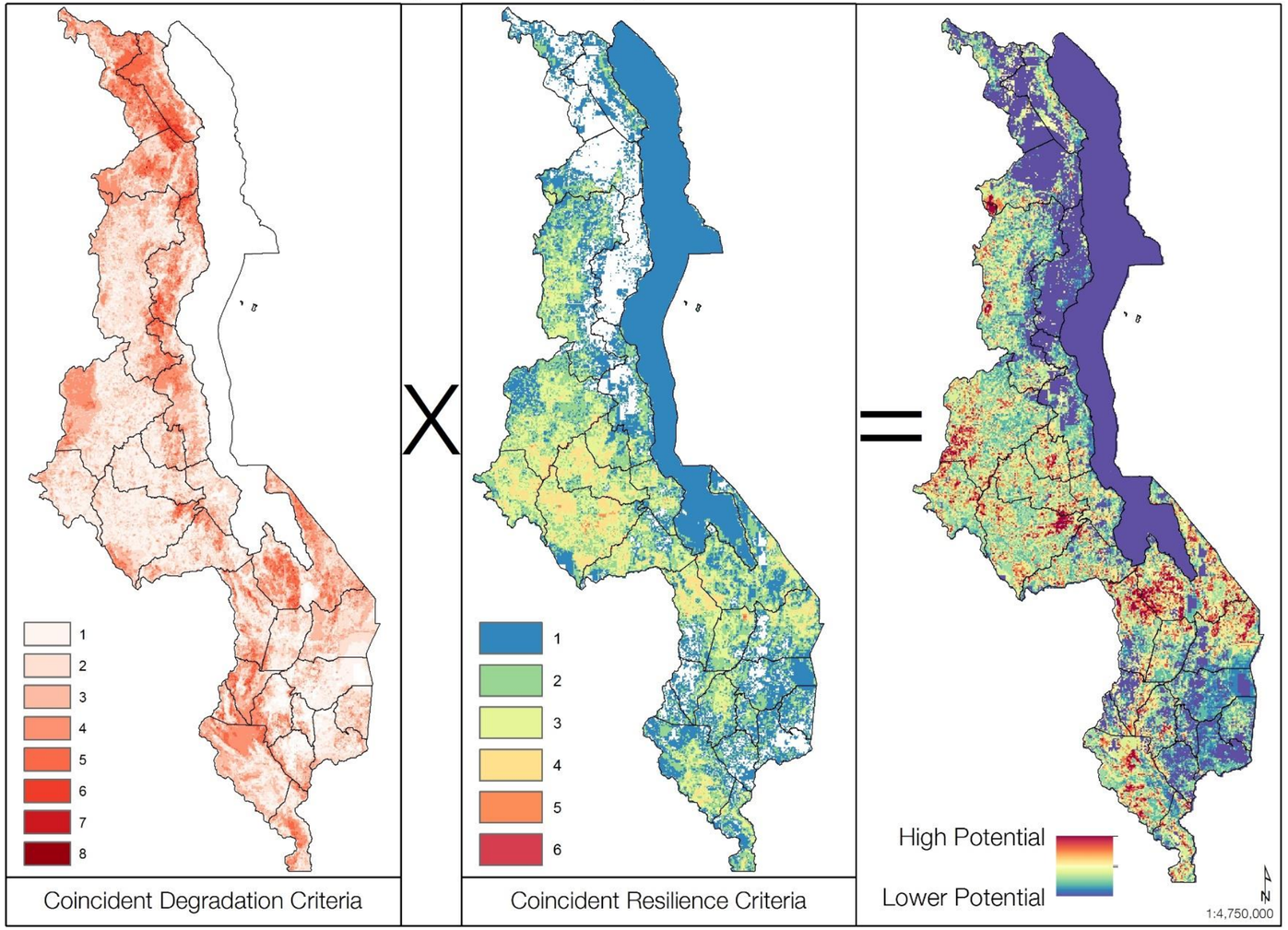


Multi-Criteria Degradation Maps

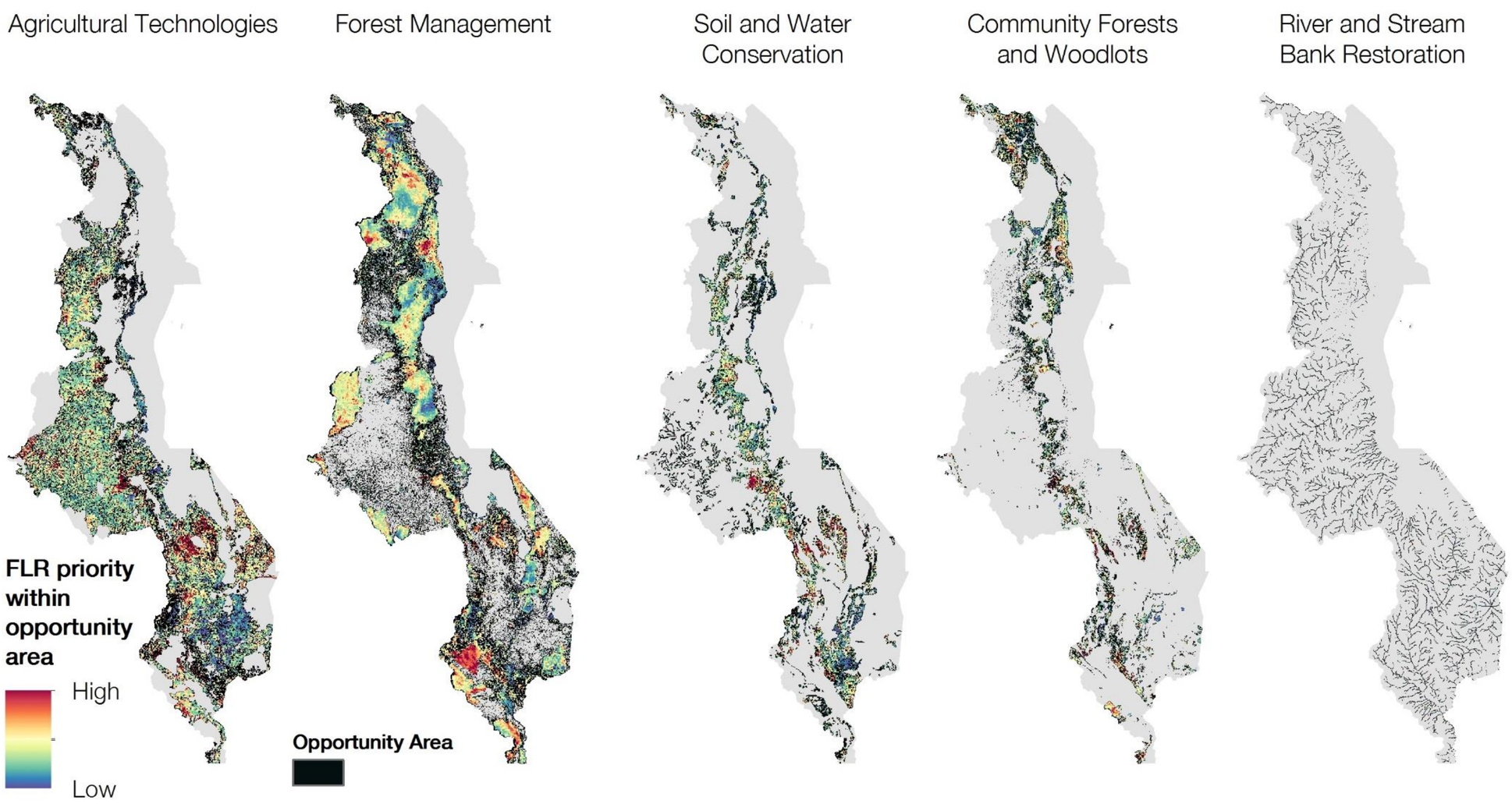


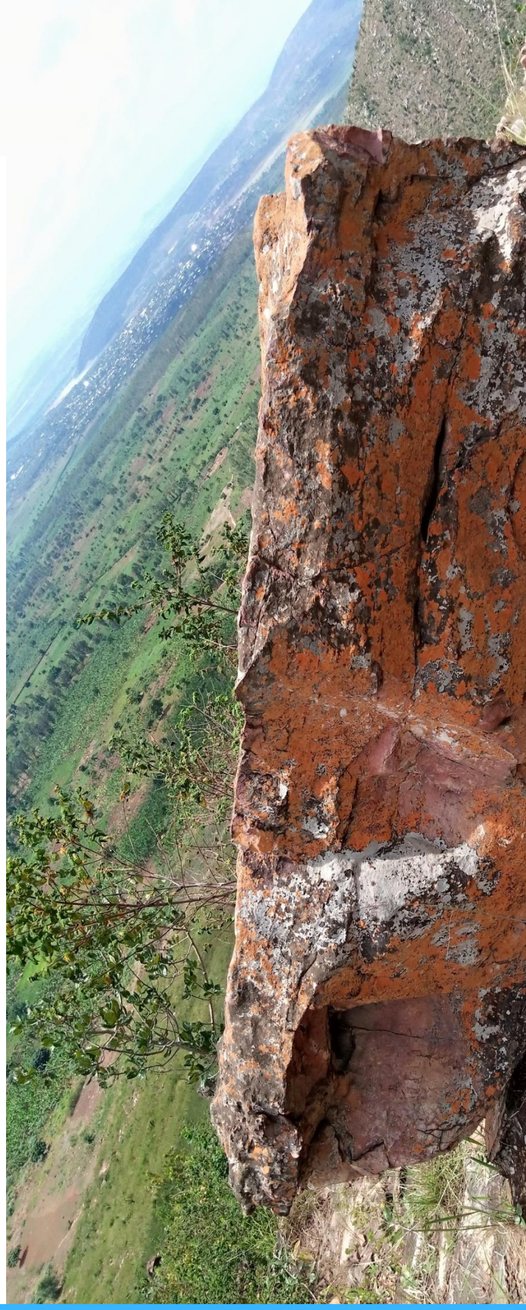
Functional Degradation Maps

MALAWI: Multi-Criteria Analysis of Landscape Restoration Potential for Resilience



Intervention

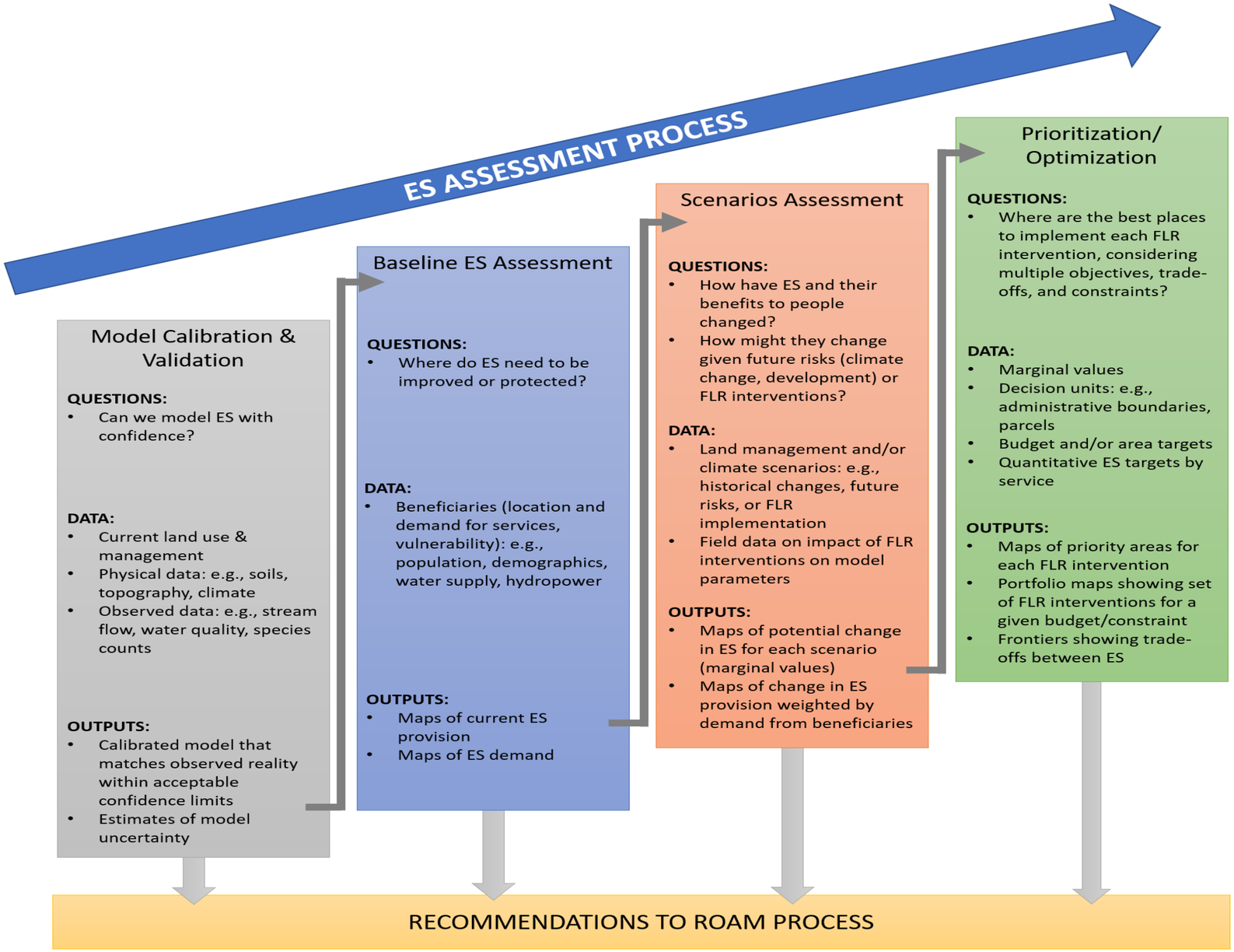


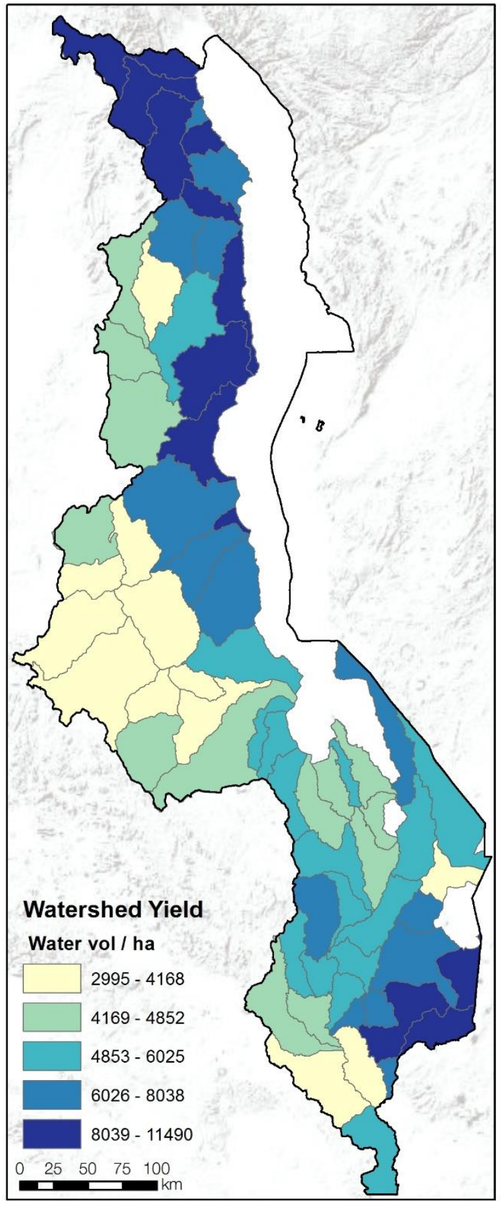


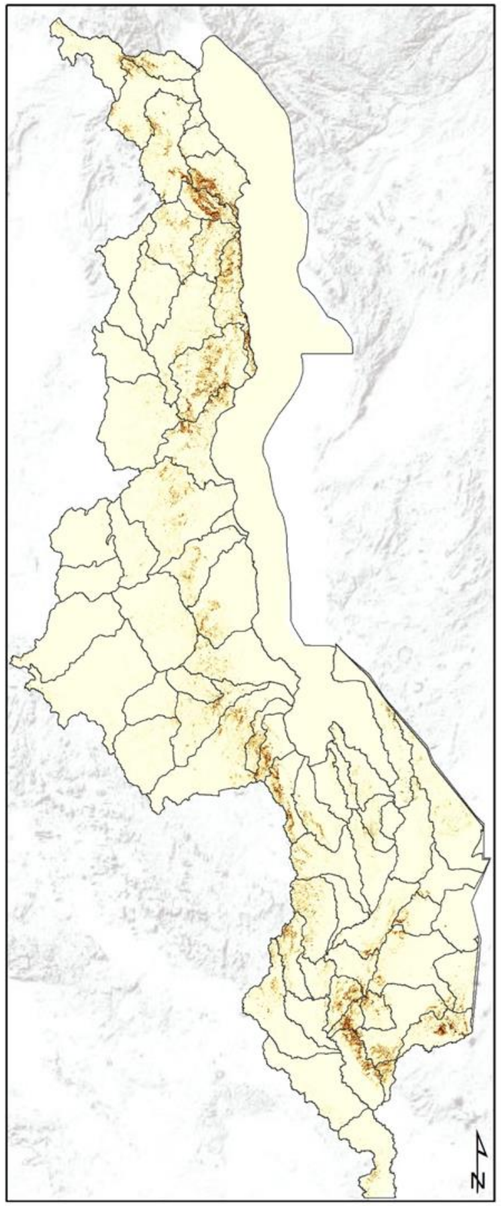
Ecosystem Assessment : ecosystem services classified into four categories:

✓ https://millenniumassessment.org/en/Framework.html

- Provisioning services – Food, fresh water, medicinal resources, fuel, etc…
- Regulating services – Climate regulation, pollination, soil retention
- Supporting services – nutrient cycling, seed dispersal, photosynthesis
- Cultural services – Aesthetic values, recreation, science & education, spiritual & religious uses


ES ASSESSMENT PROCESS
Model Calibration & Validation
QUESTIONS:
• Can we model ES with confidence?
DATA:
• Current land use & management
• Physical data: e.g., soils, topography, climate
• Observed data: e.g., stream flow, water quality, species counts
OUTPUTS:
• Calibrated model that matches observed reality within acceptable confidence limits
• Estimates of model uncertainty
Baseline ES Assessment
QUESTIONS:
• Where do ES need to be improved or protected?
DATA:
• Beneficiaries (location and demand for services, vulnerability): e.g., population, demographics, water supply, hydropower
OUTPUTS:
• Maps of current ES provision
• Maps of ES demand
Scenarios Assessment
QUESTIONS:
• How have ES and their benefits to people changed?
• How might they change given future risks (climate change, development) or FLR interventions?
DATA:
• Land management and/or climate scenarios: e.g., historical changes, future risks, or FLR implementation
• Field data on impact of FLR interventions on model parameters
OUTPUTS:
• Maps of potential change in ES for each scenario (marginal values)
• Maps of change in ES provision weighted by demand from beneficiaries
Prioritization/ Optimization
QUESTIONS:
• Where are the best places to implement each FLR intervention, considering multiple objectives, trade-offs, and constraints?
DATA:
• Marginal values
• Decision units: e.g., administrative boundaries, parcels
• Budget and/or area targets
• Quantitative ES targets by service
OUTPUTS:
• Maps of priority areas for each FLR intervention
• Portfolio maps showing set of FLR interventions for a given budget/constraint
• Frontiers showing trade-offs between ES
RECOMMENDATIONS TO ROAM PROCESS





IUCN natural capital PROJECT

Preliminary Spatial Analysis of Ecosystem Services for Landscape Restoration

MALAWI

Sediment Export

Watershed Sediment Export per hectare

- 0.01090 - 0.1469
- 0.1470 - 0.2883
- 0.2884 - 0.5003
- 0.5004 - 1.120
- 1.121 - 3.744

Sediment Export

Mg/ha/year

High : 1367.39

Low : 0

Prepared by Craig R. Beatty Kelly Meza Prado and Orli Handmaker, International Union for Conservation of Nature and Natural Capital Project, October 2016. Data Provided by MASDAP, Government of Malawi, Hansen/UMD/Google/USGS/NASA, FAO HWSD, ESRI and NOAA. Projection WGS 1984 UTM Zone 36S. This map is intended as a preliminary estimate of water yield. Presented values are unverified and intended for explanitory purposes only.

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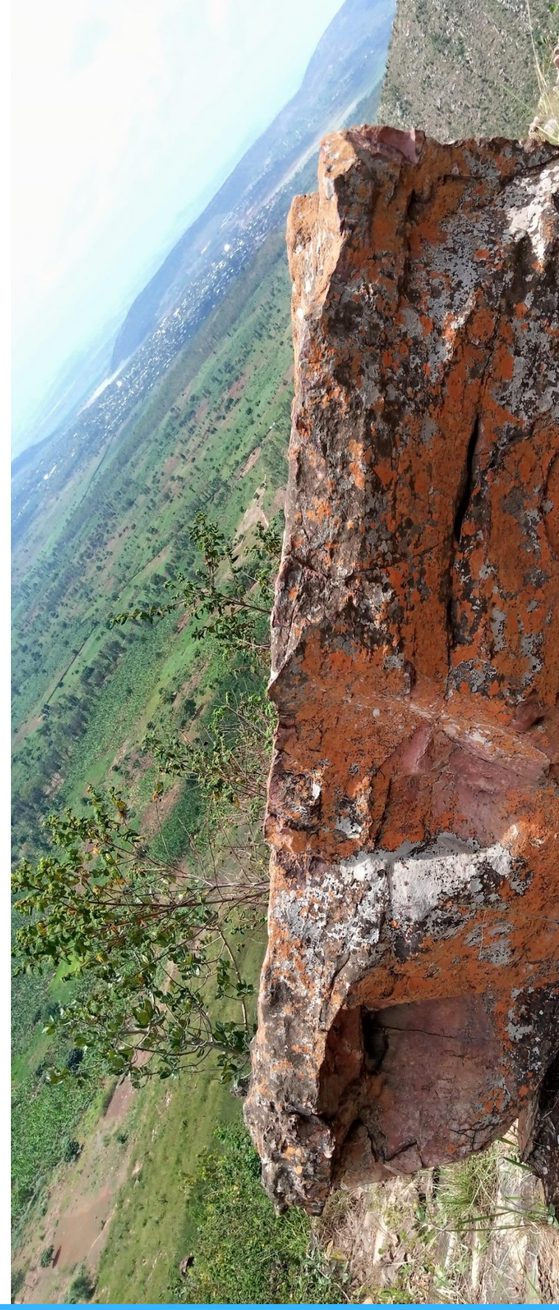
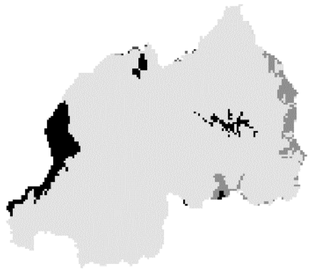
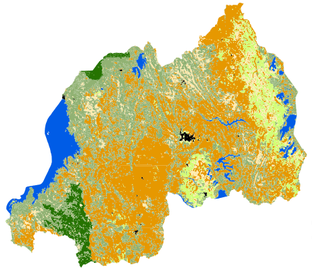


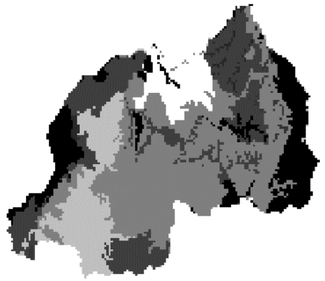


Root Restricting Depth

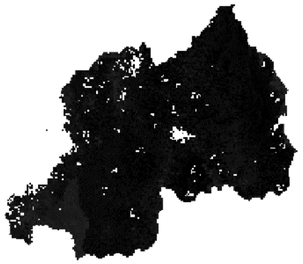
Precipitation



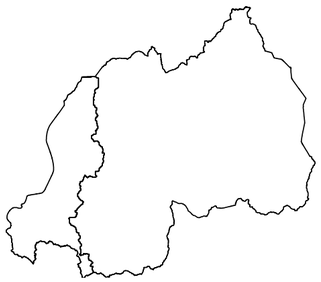
LULC



PAWC



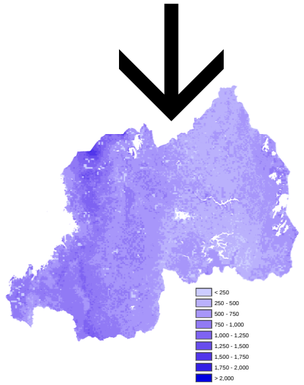
Evapotranspiration



Watersheds

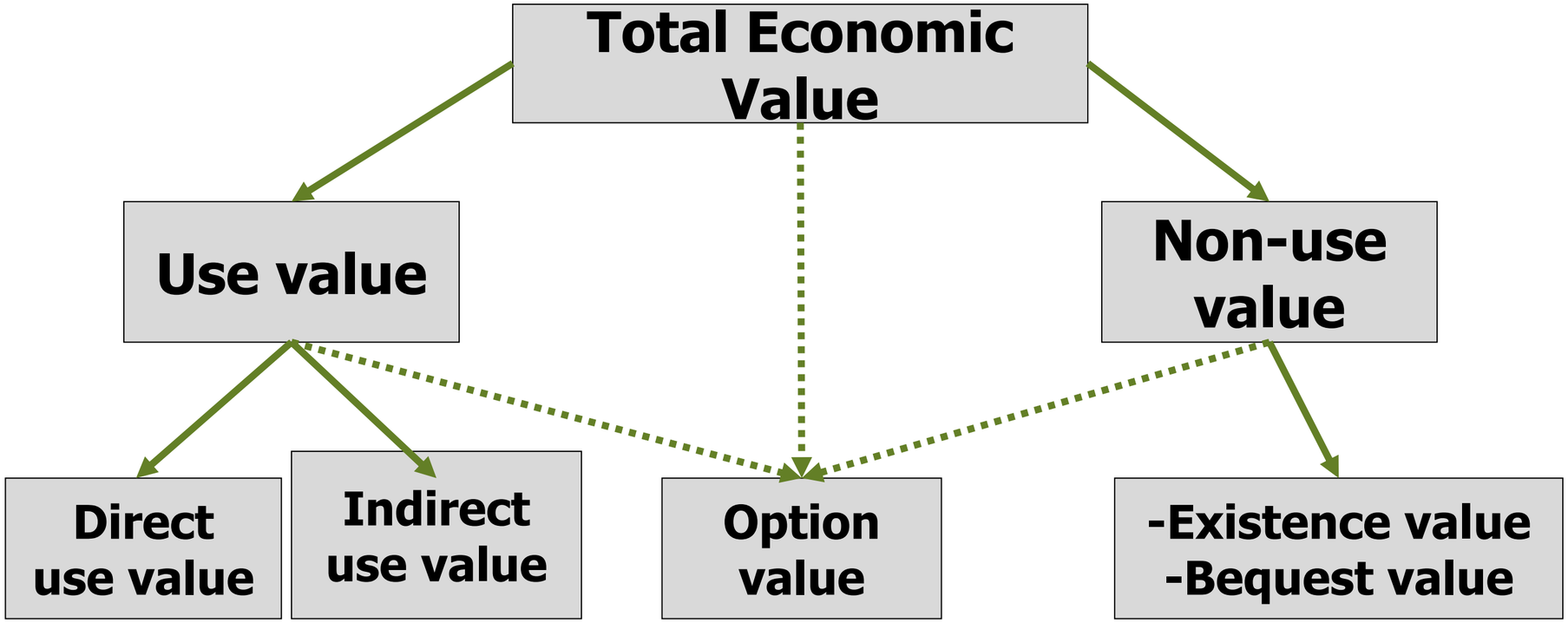
InVEST

integrated valuation of environmental services and tradeoffs



Benefits-Valuation of Environmental Amenities

Total economic value



Example:
- *Timber*
- *Recreation*

Example:
- *Water purification*
- *Carbon sequestration*

Example:
- *Soil fertility*
- *Biodiversity*

Example:
- *Rare species*
- *Inheritance*

Pagiola et al, 2004

Valuation Method

- Cost Benefit Analysis
- Market Valuation: Direct market price, Avoided damage method
- Non-market valuation:

→Revealed preferences: Hedonic pricing, Travel cost method,

→Stated preferences: Contingent valuation method, choice modelling

- Benefit transfer method

CBA: Appraisal criteria

- NPV
- BCR
- ROI

The Value of a Gender-Responsive Approach in Forest Landscape Restoration

- Women and men's dependence on natural resources is different- gender roles
  - Obtain different products and receive different benefits from forests
  - Have different knowledge, access and control of forests
- Contribute in a different manner to forest conservation and management

Why consider gender aspects in restoration?

- Women encompass an average of **43% of the agricultural labour force** in developing countries.

- If women had the same access to productive resources as men, they could increase **yields on their farms by 20% to 30%,** in turn reducing the number of hungry people in the world by 12% to 17%.

- Women **have the same legal rights** as men to own and access land **in only 28 countries** worldwide

Why consider Youth in FLR?

- The large **majority of the youth lives in rural areas in Africa** and mostly **employed in agriculture**, accounting for 65% of total employment
- Rural youth are the future of food security. Yet around the world, **few young people see a future for themselves in agriculture and forestry sector**
- Young people have huge potential to contribute to forest conservation and restoration of degraded landscapes

What are the challenges for youth and women?

- Access to and control over productive resources (e.g. land and capital)
- Inadequate skills (e.g. lack of indigenous farming knowledge due to generational gap)
- Discriminations often result into higher unemployment rates for young girls
- Lack of engagement of youth and women as a stakeholder in development strategies

Culture and FLR

There are different themes or domains where culture influences FLR?

- Related to land, land tenure, governance and rights:
- Related to specific landscapes, features in the landscape, and/or specific sites (forest or non-forest) e.g. sacred natural sites.
- Related to specific plant and animal species:
  - Food
  - Taboos and beliefs
  - Medicines
  - Construction
  - Others
- Arts and crafts:
- Related to institutions and cultural leadership:
- Related to spirituality and religion

Thank you

IUCN