# FOREST & LANDSCAPE RESTORATION

WORLD RESOURCES INSTITUTE

IUCN

Kathleen Buckingham | Jambi, 29 April 2014

Research Associate | World Resources Institute

15 BONN CHALLENGE 2011

THE GLOBAL PARTNERSHIP ON FOREST LANDSCAPE RESTORATION

# PRESENTATION STRUCTURE

1. Degradation and Restoration of Land and Ecosystems

2. Restoration Opportunities Assessment Methodology

3. Rapid Restoration Diagnostic

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# Degradation and Restoration of Land and Ecosystems

Review of Global Estimates
29th April 2014


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# OBJECTIVES

For ecosystems and landscapes …

- Provide a clear conceptual framework
- Review global and selected sub-global estimates
- Assess global area of degradation and restoration potential ("reasonable estimates")
- Identify and quantify expected benefits of restoration

# SIX GLOBAL ECOSYSTEMS WERE ASSESSED

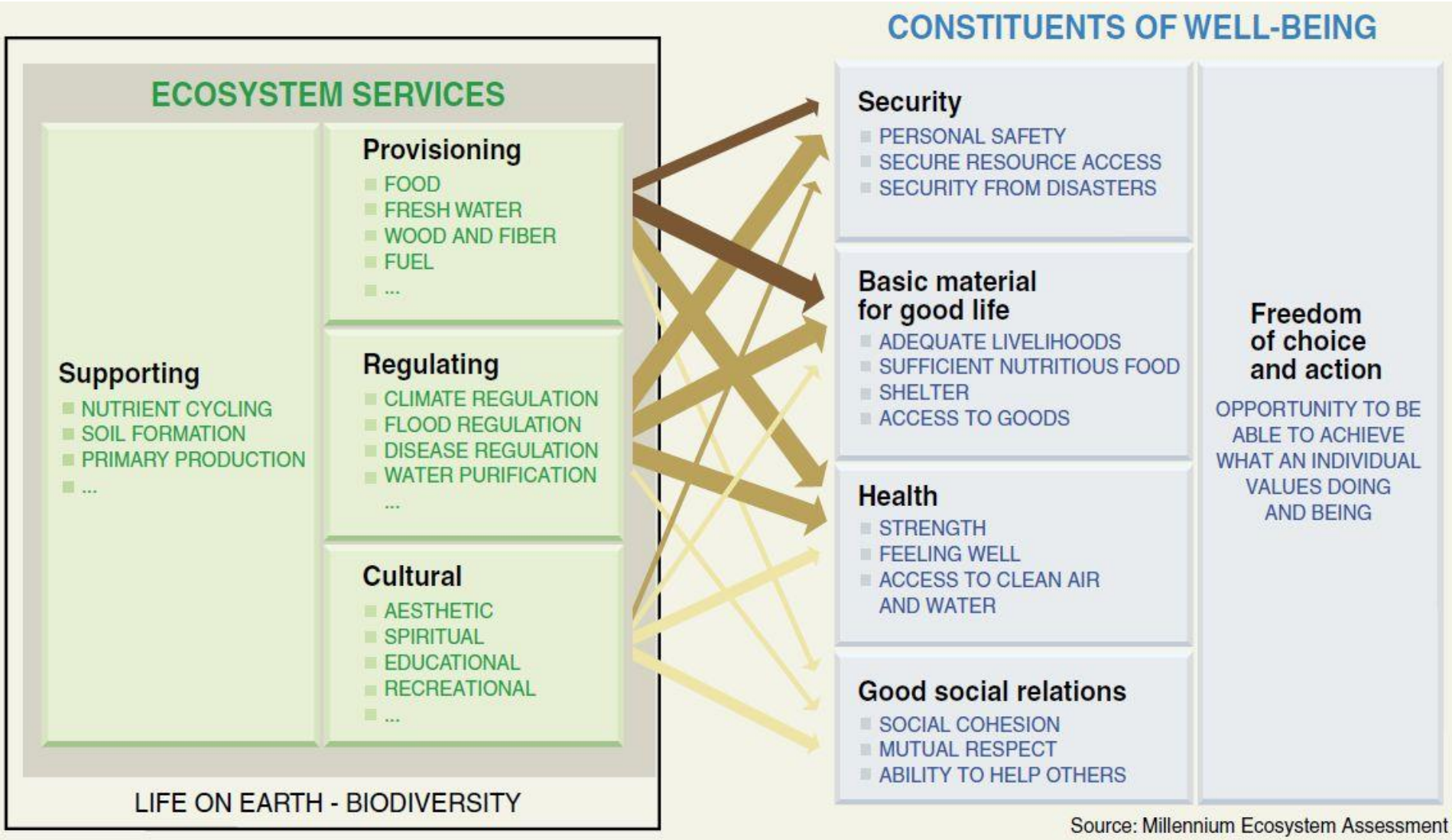
- **Agroecosystems:** irrigated and rainfed cropland; pasture
- **Grasslands ecosystems**: natural grasslands incl. savannah, shrubland, and tundra; pasture
- **Forest ecosystems:** all ecosystems with a tree crown cover of >10%
- **Dryland ecosystems**: all areas under water stress, partly also deserts
- **Wetland ecosystems**: inland freshwater habitats, including peatlands
- **Coastal ecosystems**: terrestrial fraction only, mainly mangroves.

# Aichi Biodiversity Targets | 3 "land-based" targets


- Cut natural habitat loss by at least half
- Reduce degradation and fragmentation significantly


- Protect or conserve at least 17 % of terrestrial and inland water areas
- Protect or conserve at least 10 % of coastal and marine areas


- Restore at least 15 % of degraded ecosystems
- Enhance resilience, contribute to climate change mitigation and adaptation, combat desertification through conservation and restoration

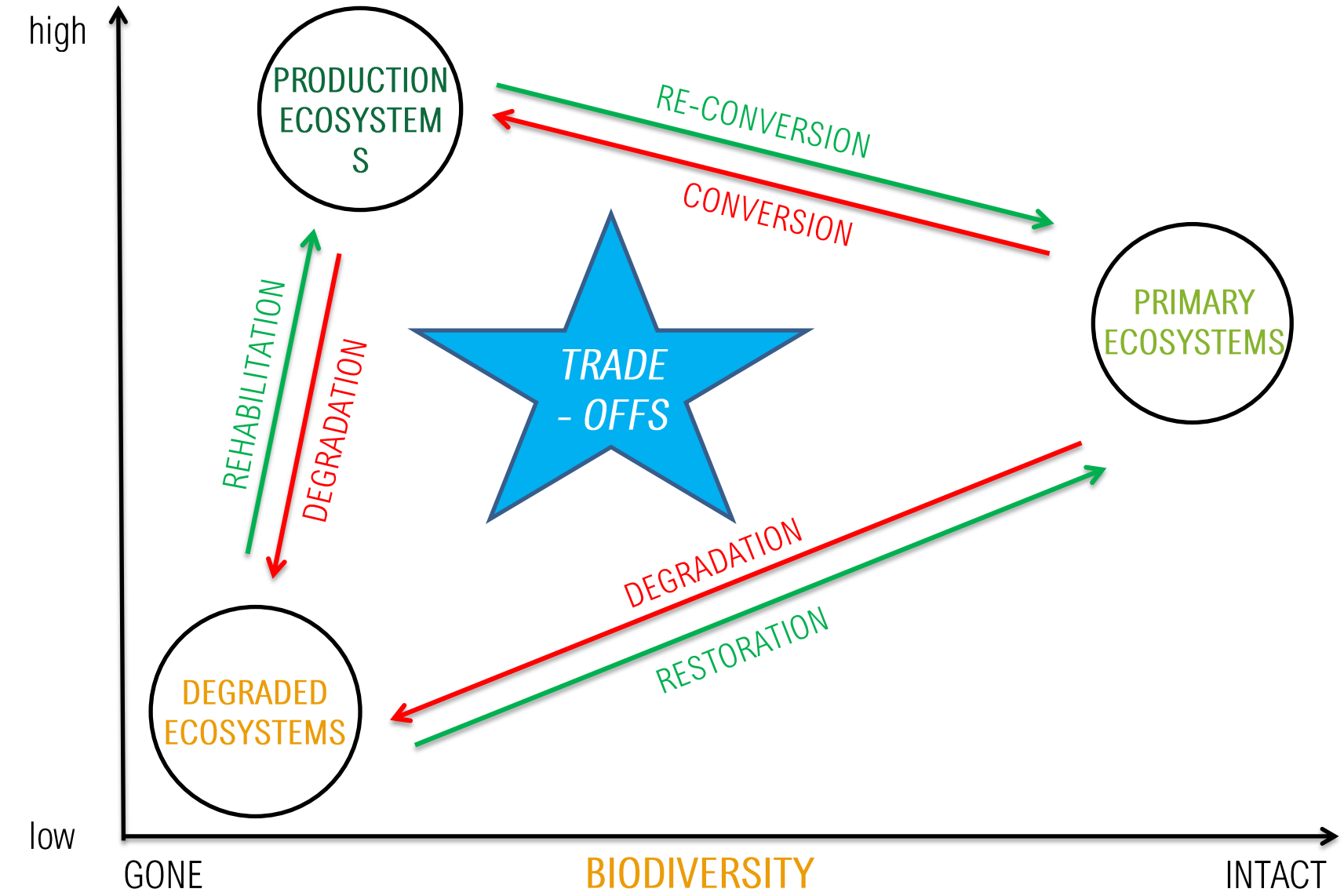



Source: Millennium Ecosystem Assessment

# BIODIVERSITY, ECOSYSTEM SERVICES, WELL-BEING

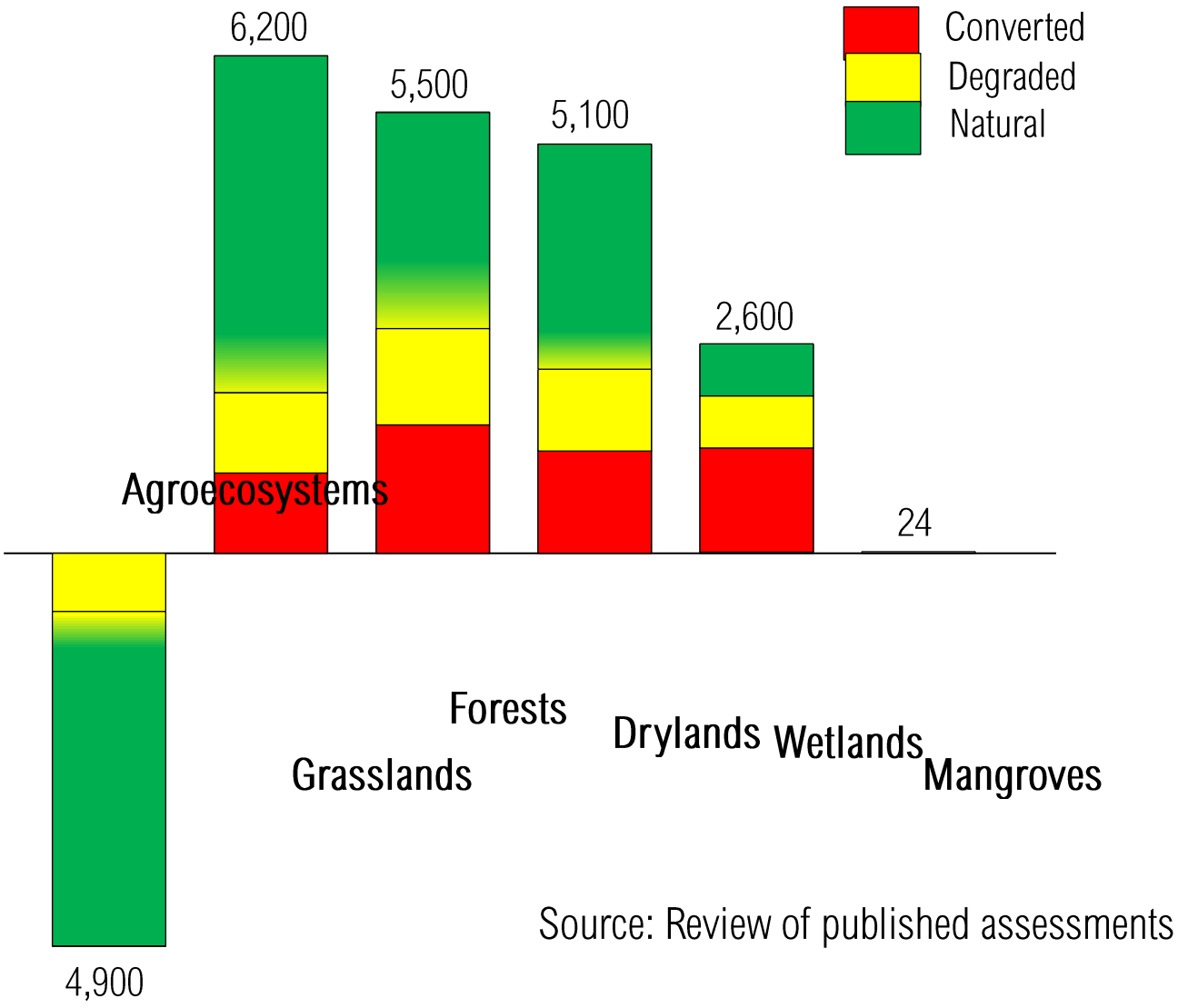
# DEGRADATION AND RESTORATION

a simple conceptual framework



# GLOBAL ECOSYSTEM STATUS

(extent, million ha)




Source: Review of published assessments

# RESULTS

- Estimates are of extent, not intensity
- Extent has generally declined between a quarter and a half
- Wetlands and mangroves are the most diminished
- Estimates vary widely
- Deriving precise estimates at ecosystem level is therefore speculative

# WHY DO ESTIMATES DIFFER SO MUCH?

- Definitions are different
  - Ecosystems
  - Degradation
- Data sources are different
  - Ground observations vs. remote sensing
- Observations are missing
  - Existing estimates are uncertain
  - Data gaps are prevalent

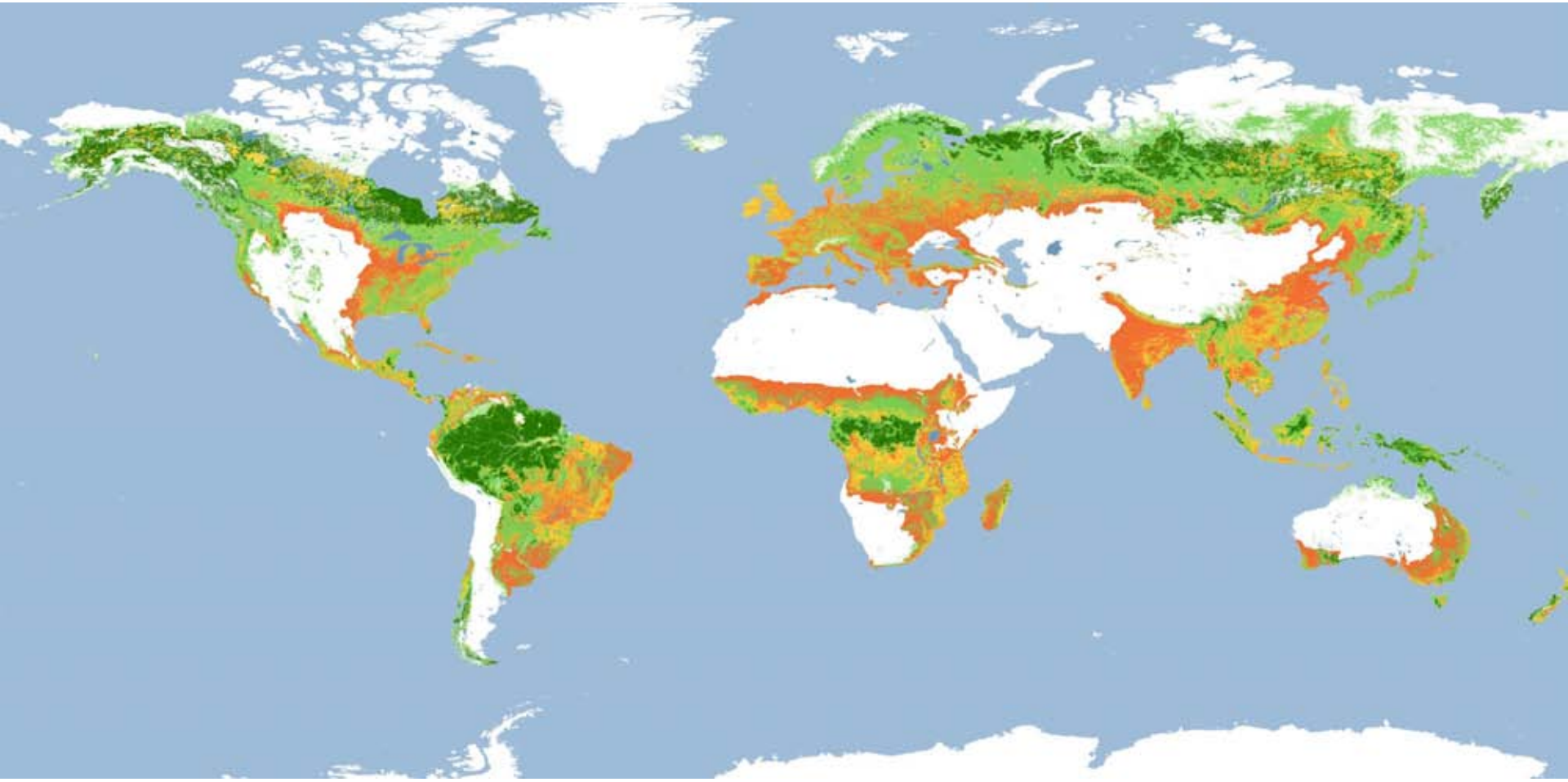
# RECOMMENDATIONS

- Do not let terminology get in the way
  - e.g., demarcation of restoration and rehabilitation, or international harmonization of definitions

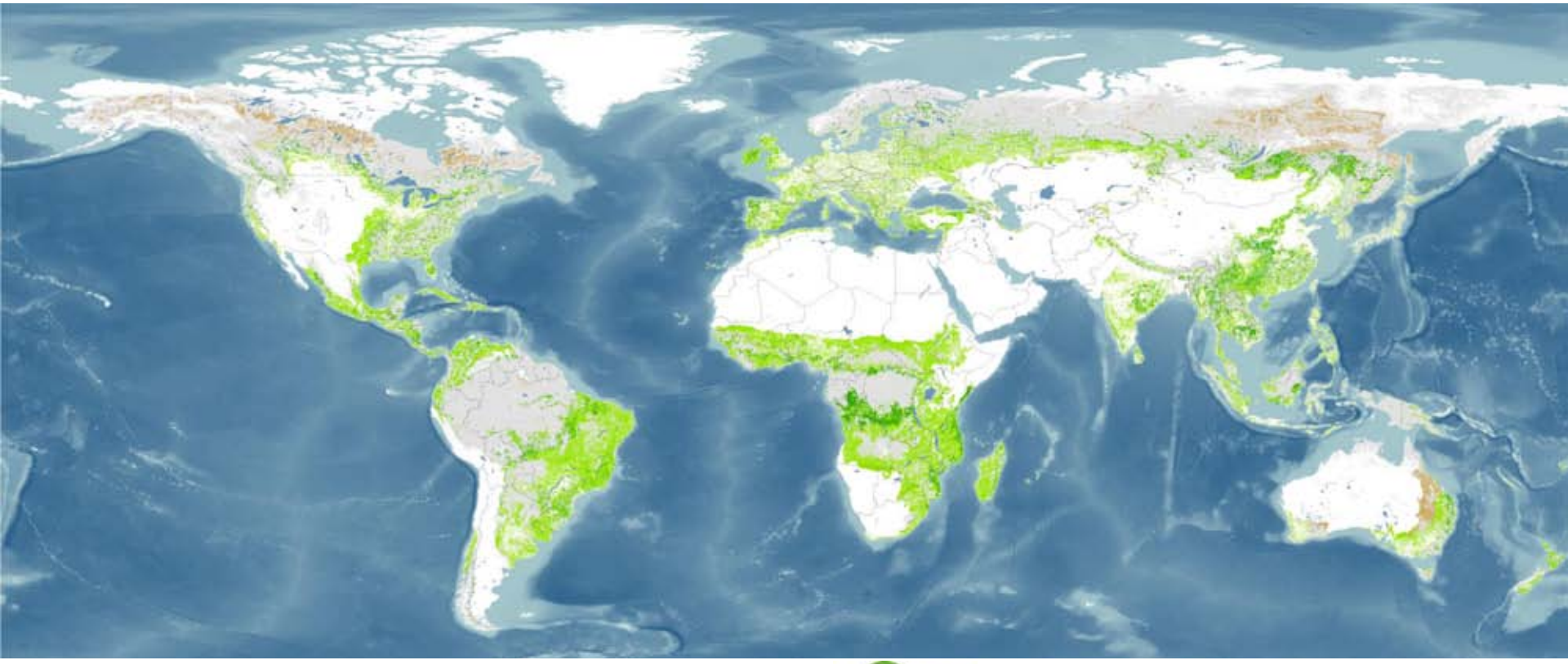
- Increase global efforts in mapping and monitoring
  - now grossly inadequate compared to the complexity of the task and importance of the result

# Forest condition

On lands where forests can grow



# Forest and Landscape Restoration Opportunity



FOREST AND LANDSCAPE RESTORATION OPPORTUNITIES

- Wide-scale restoration
- Mosaic restoration
- Remote restoration
- Current forest

THE GLOBAL PARTNERSHIP ON FOREST LANDSCAPE RESTORATION

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# 2

# Restoration Opportunities, Assessment Methodology

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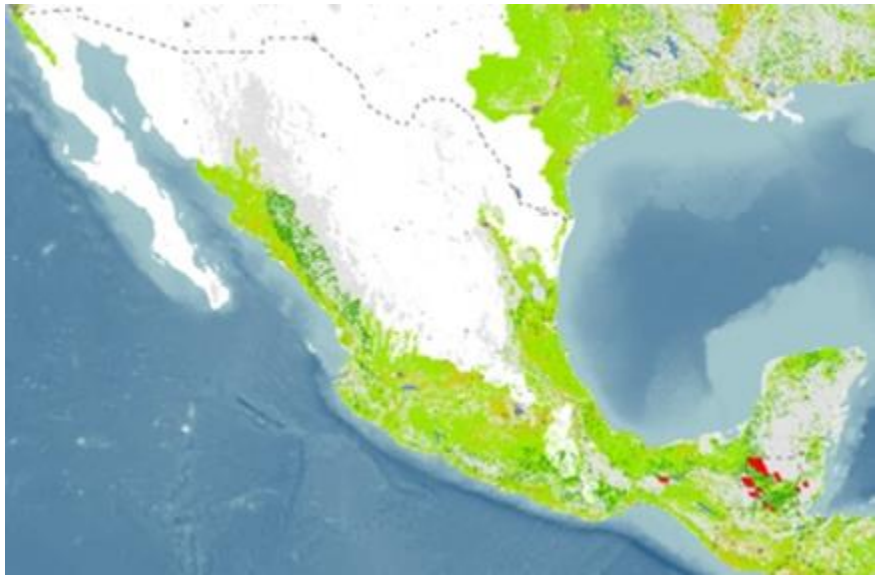
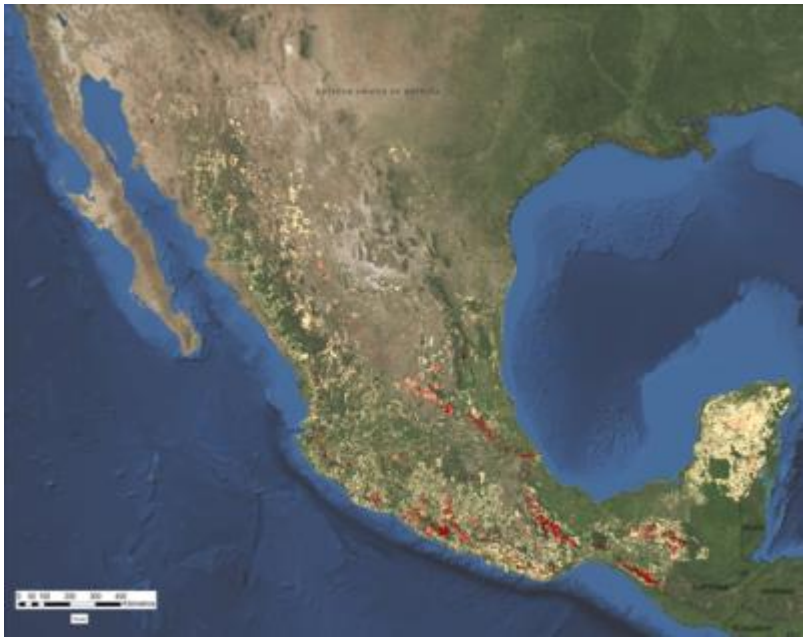
# The challenge: to move from the global generic to national specifics





.... and to identify priority actions and priority landscapes

# The goal is to frame sub/national programmes that offer workable and cost-effective strategies for landscapes like these

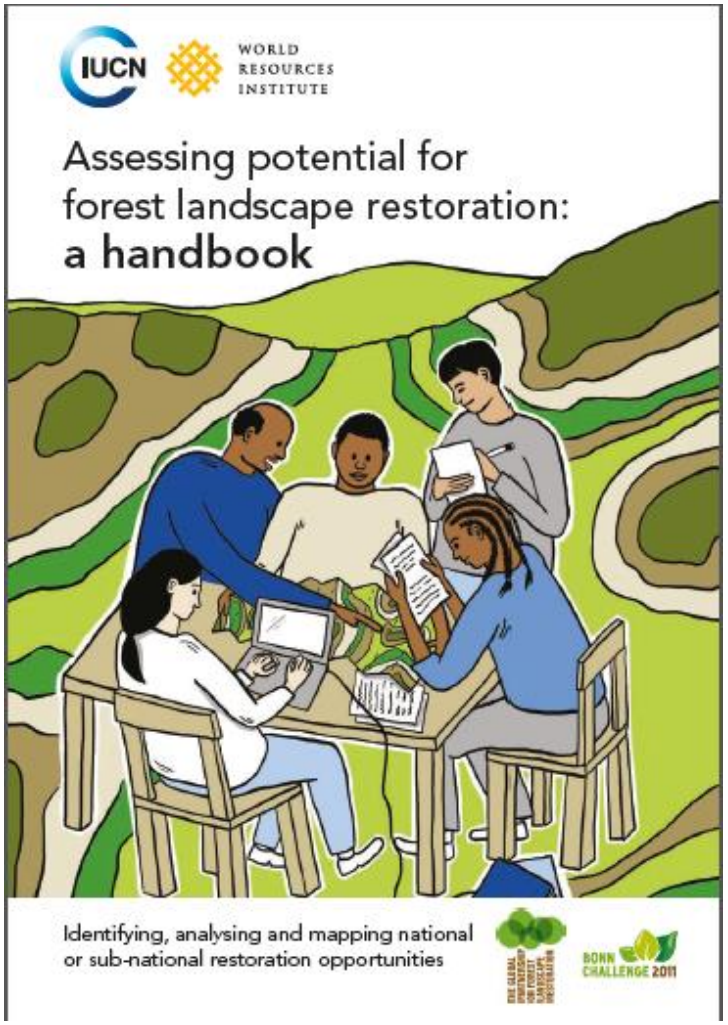
Rwanda's deforested mountains hold tremendous potential for restoration that can improve lives

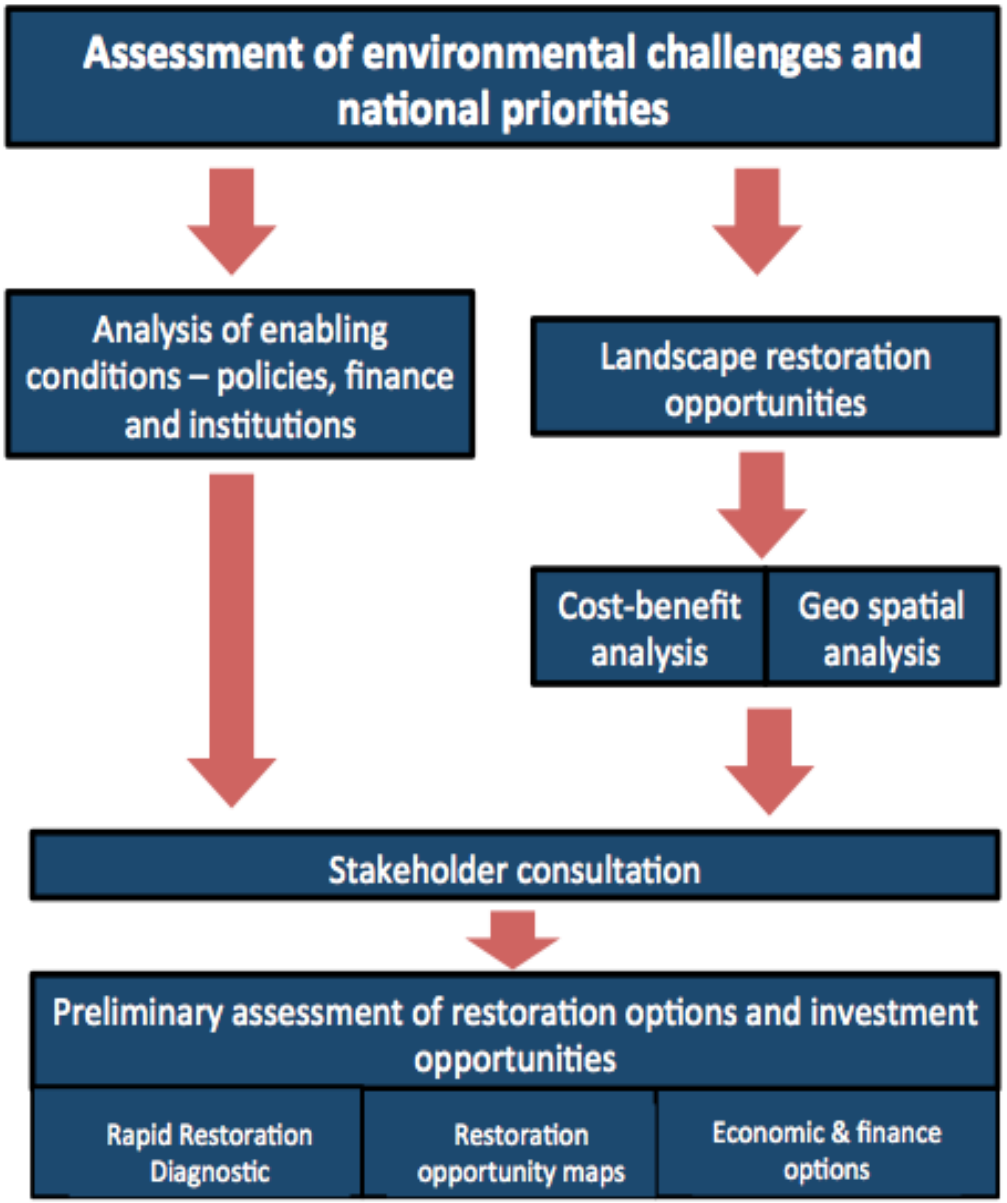
# Primary challenges include

1. Lack of data: degraded lands and natural resources are opaque – if not invisible – as are the livelihoods of people who live there
   - Spatial and biophysical data needed
   - Economic and social data needed

2. Lack of coherence: in policy & programmes
   - Either institutional competition
   - Or (more likely) institutional myopia

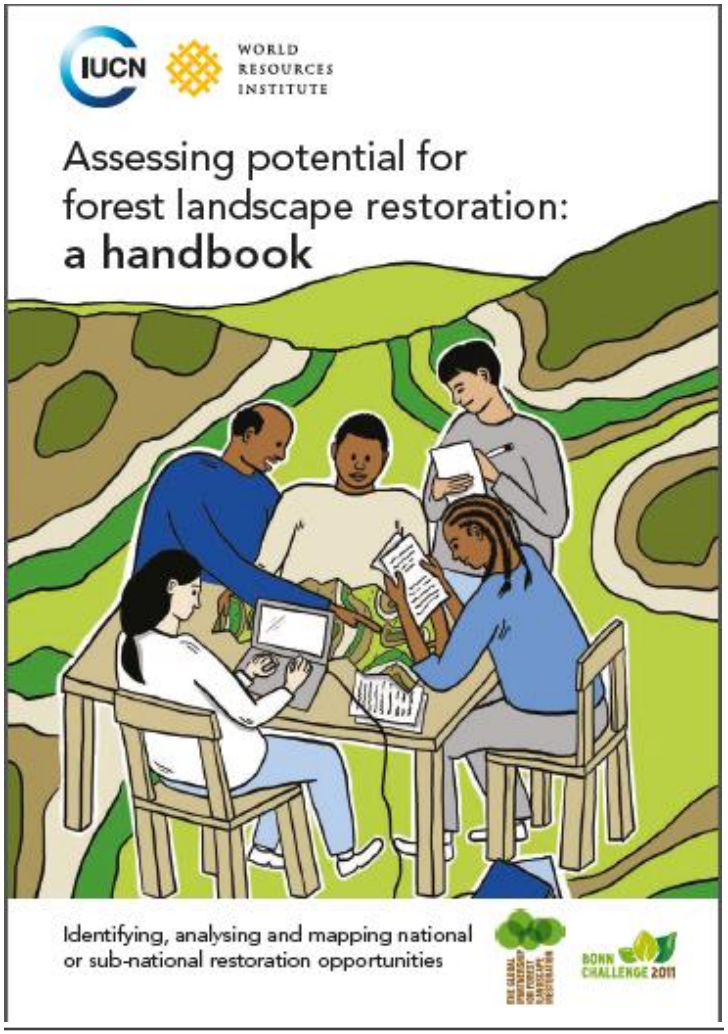
# Restoration Opportunities Assessment Methodology (ROAM)



# The Components of ROAM include

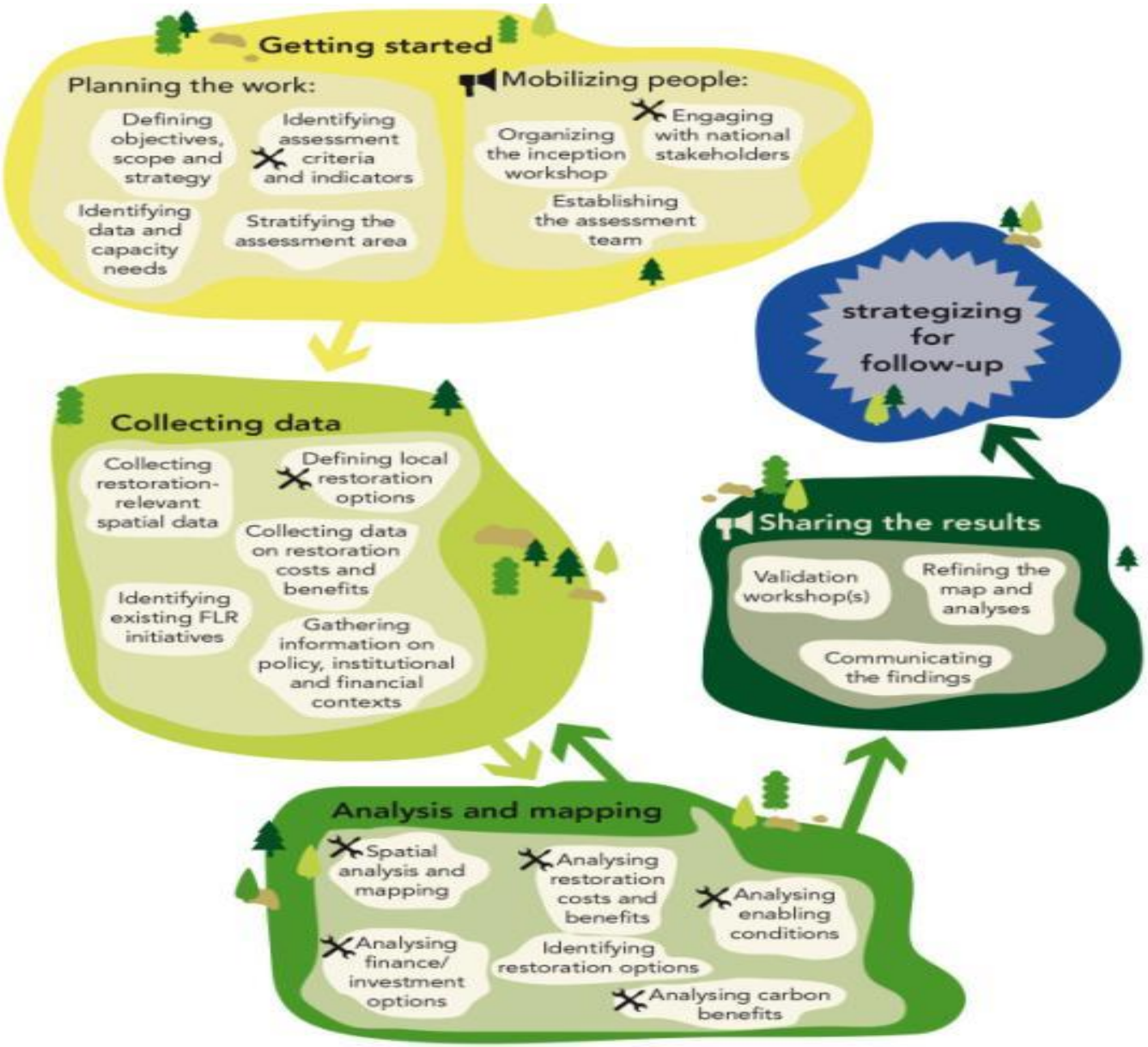
1. Restoration Opportunities Mapping
2. Restoration Economic Valuation
3. Restoration Carbon ACCRUAL
4. Restoration Rapid Diagnostic of Success Factors
5. Restoration Finance Assessment



# The purpose of ROAM assessments is to

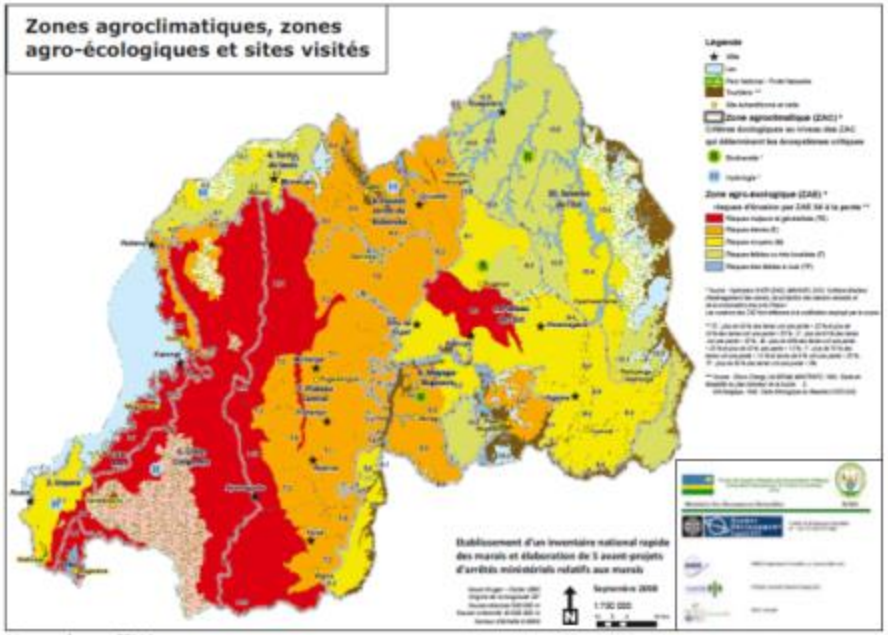
- Identify, analyse and map the overall potential and areas of opportunity for forest landscape restoration (FLR) on a national or sub-national level
- Support countries, organizations, communities and enterprises in defining and implementing pledges to the Bonn Challenge target to restore 150 million hectares worldwide by 2020
- Provide a basis for national policies like NAPAs, contribute to international programmes like UN-REDD, and catalyze innovative financing

# The ROAM process summarized



# The Restoration Opportunities Assessment Methodology aims to bridge these gaps with...

Figure 4: Agro-climatic zones and risk of soil erosion

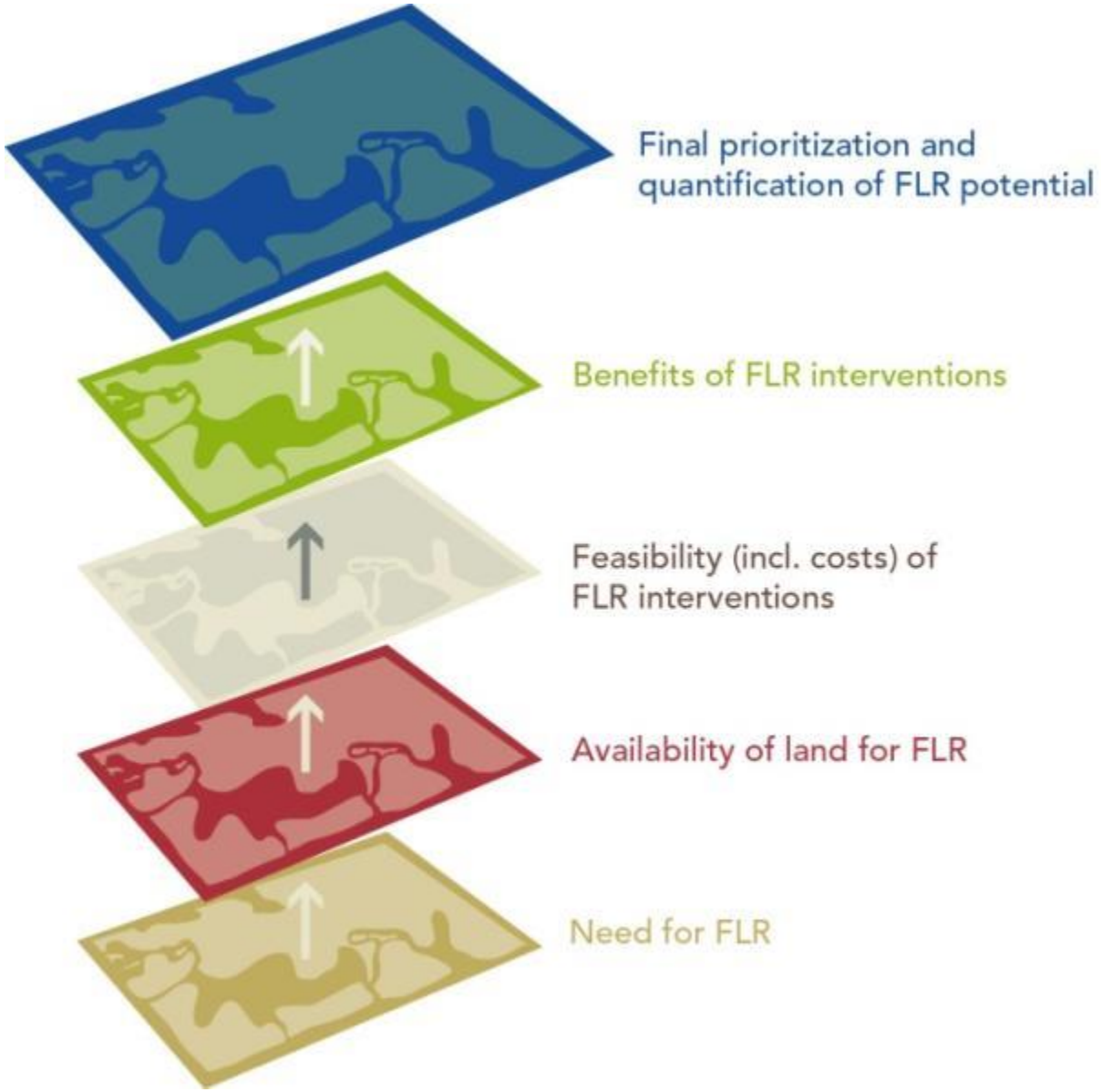


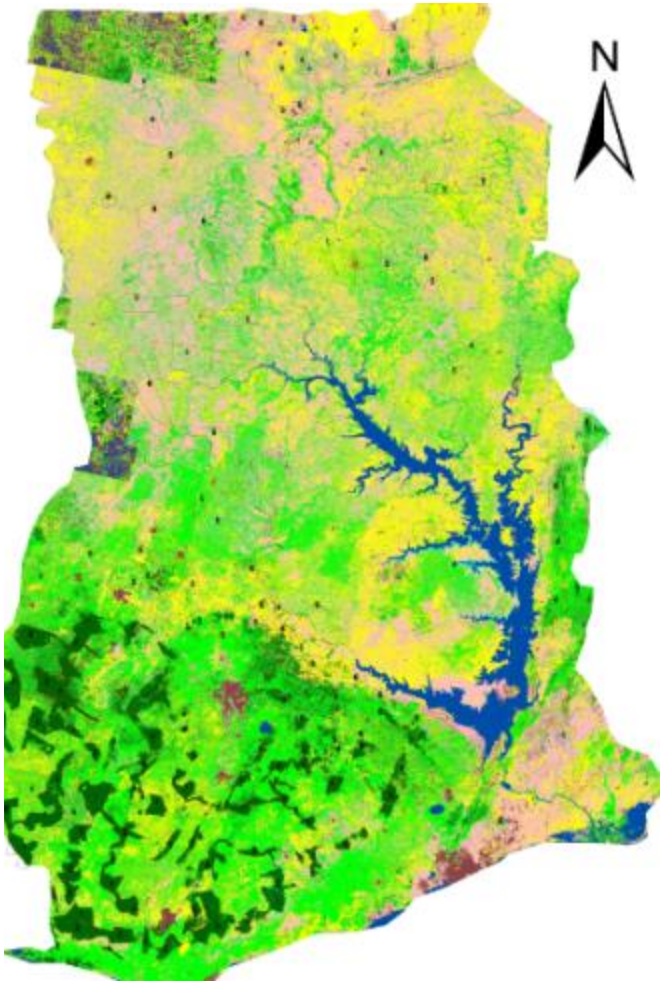

Map production: REMA

Best available science and data

Best informed knowledge & insights

# Analysis and Mapping



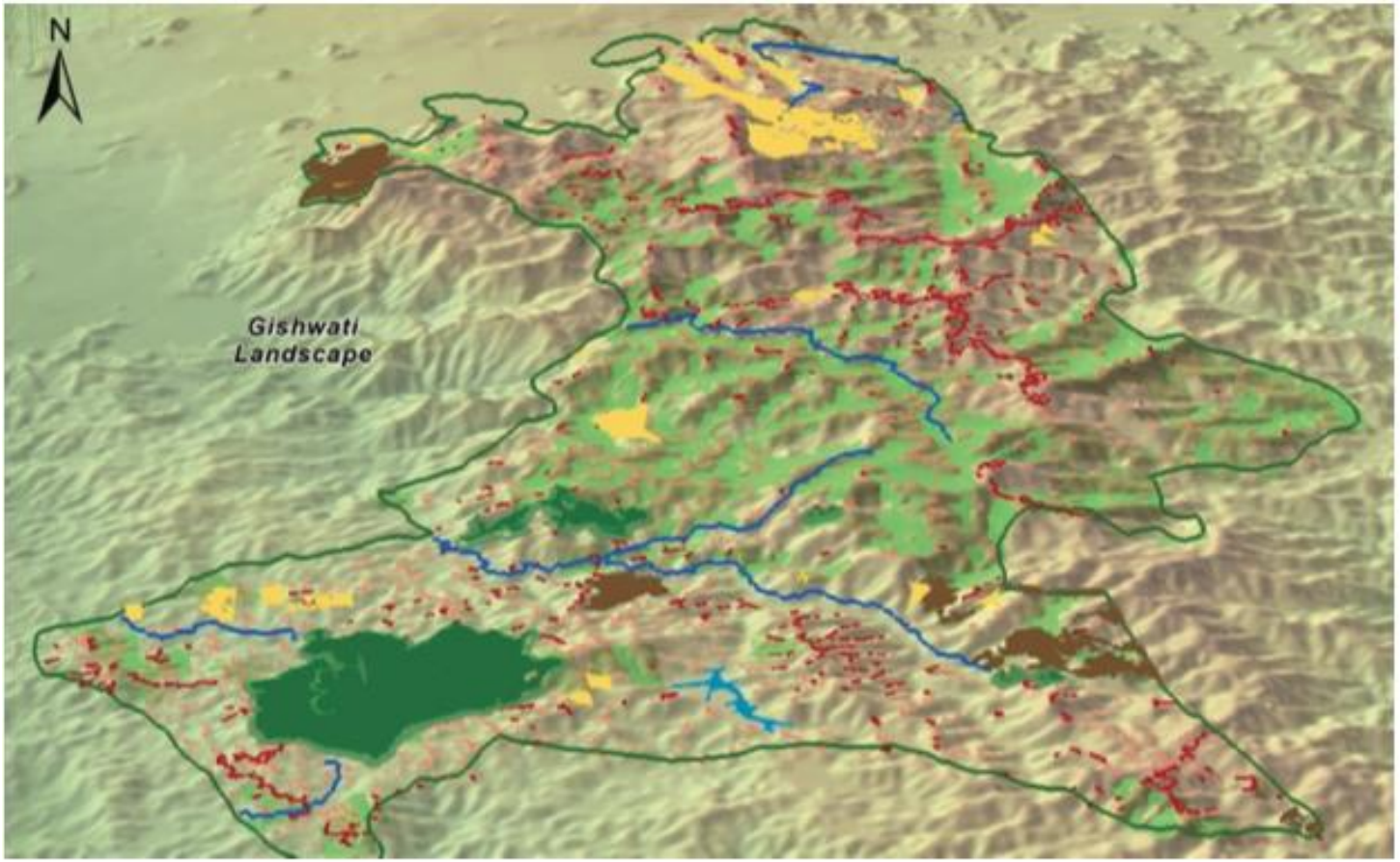
# Economic analysis can be a key step in restoration

**It allows you to:**

- Anticipate costs of interventions
- Understand net benefits – “what, when and to whom”
- Pick high priority / value landscapes – “where”

# What is the analysis process?

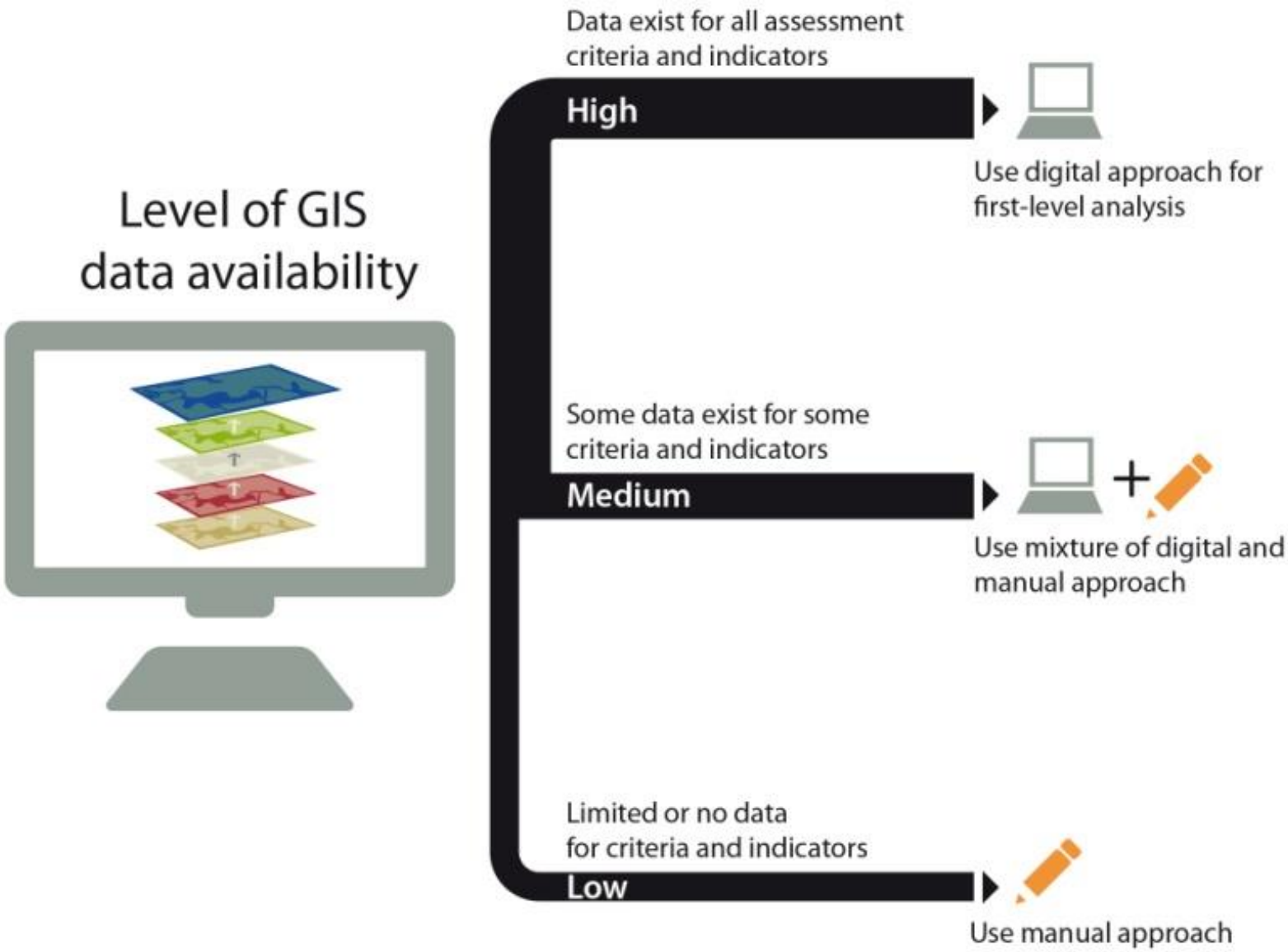
# 1. Conducting digital spatial analysis





- Deforested area in riparian corridors
- Existing natural forest
- Area for buffers around natural forest
- Degraded natural forest
- Deforested area surrounding wetlands
- Deforested area on steeply sloped ridges (>55%)
- Deforested area on moderately sloped ridges (20% < slope < 55%)
- Degraded agricultural land
- Silvopastoral areas
- Gishwati landscape

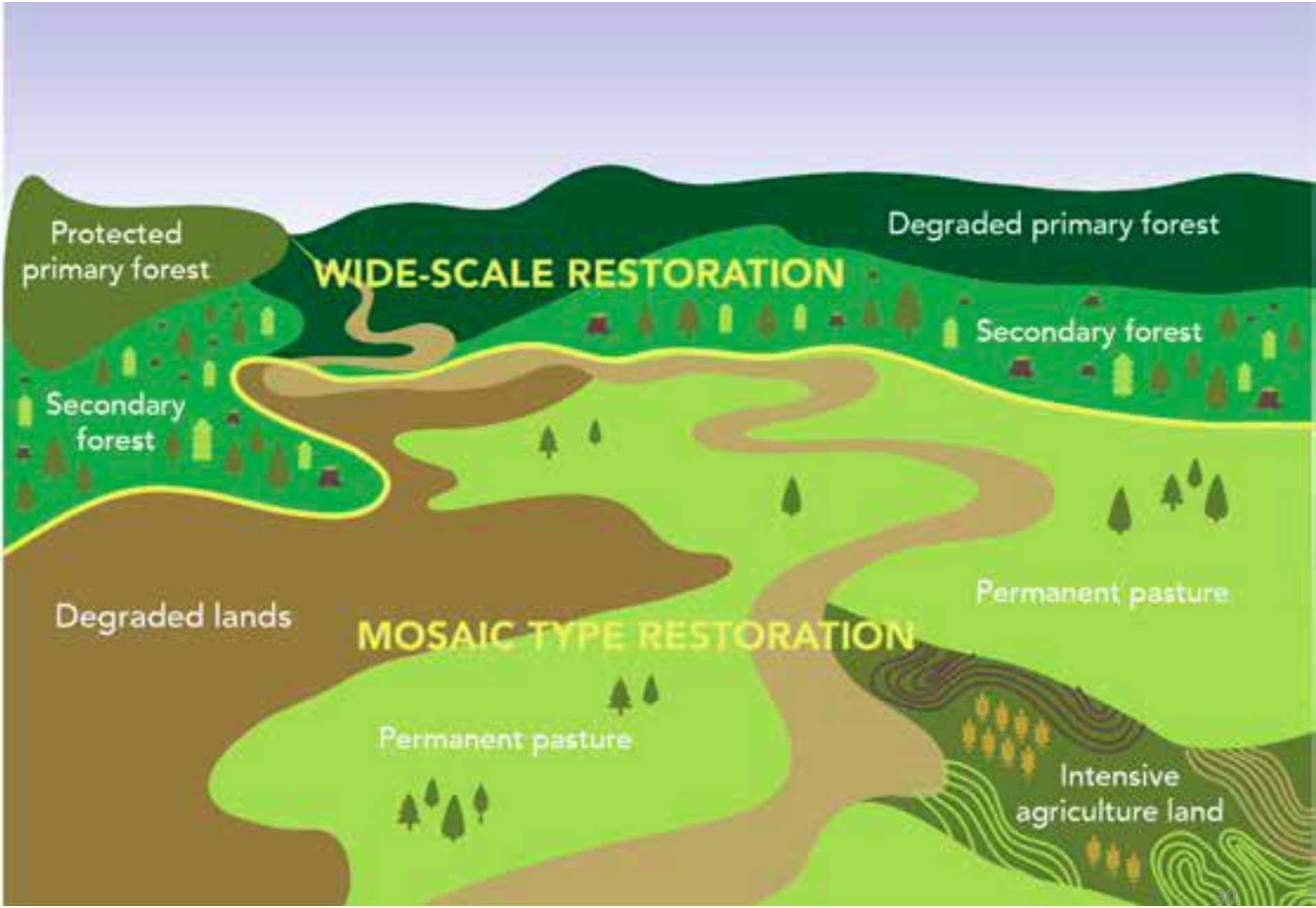
# Analysis and Mapping



# 2. Considering Restoration Transitions

- We consider degraded land uses in the project area:
  - E.g., degraded agriculture, poorly managed woodlots and plantations, deforested land, etc.
- And identify transitions to restored landscapes. E.g.:

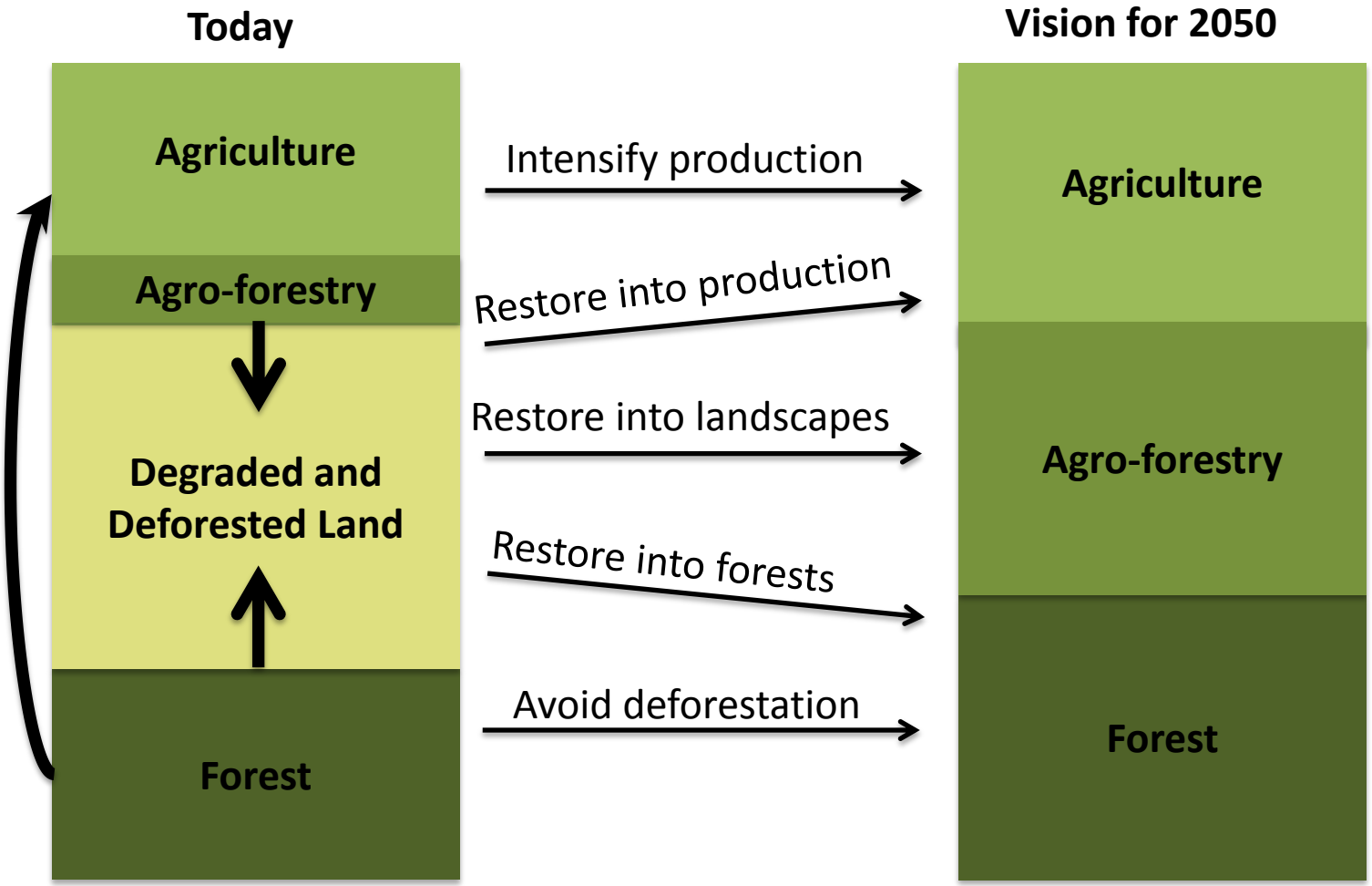
- Agriculture → Agroforestry
- Poorly managed woodlots and plantations → Well managed
- Degraded forest → Naturally regenerated secondary forest
- Deforested land → Protective forests (buffers and ridgetops)


Protected primary forest
WIDE-SCALE RESTORATION
Degraded primary forest
Secondary forest
Secondary forest
Degraded lands
Permanent pasture
MOSAIC TYPE RESTORATION
Permanent pasture
Intensive agriculture land

# Identifying potential FLR options

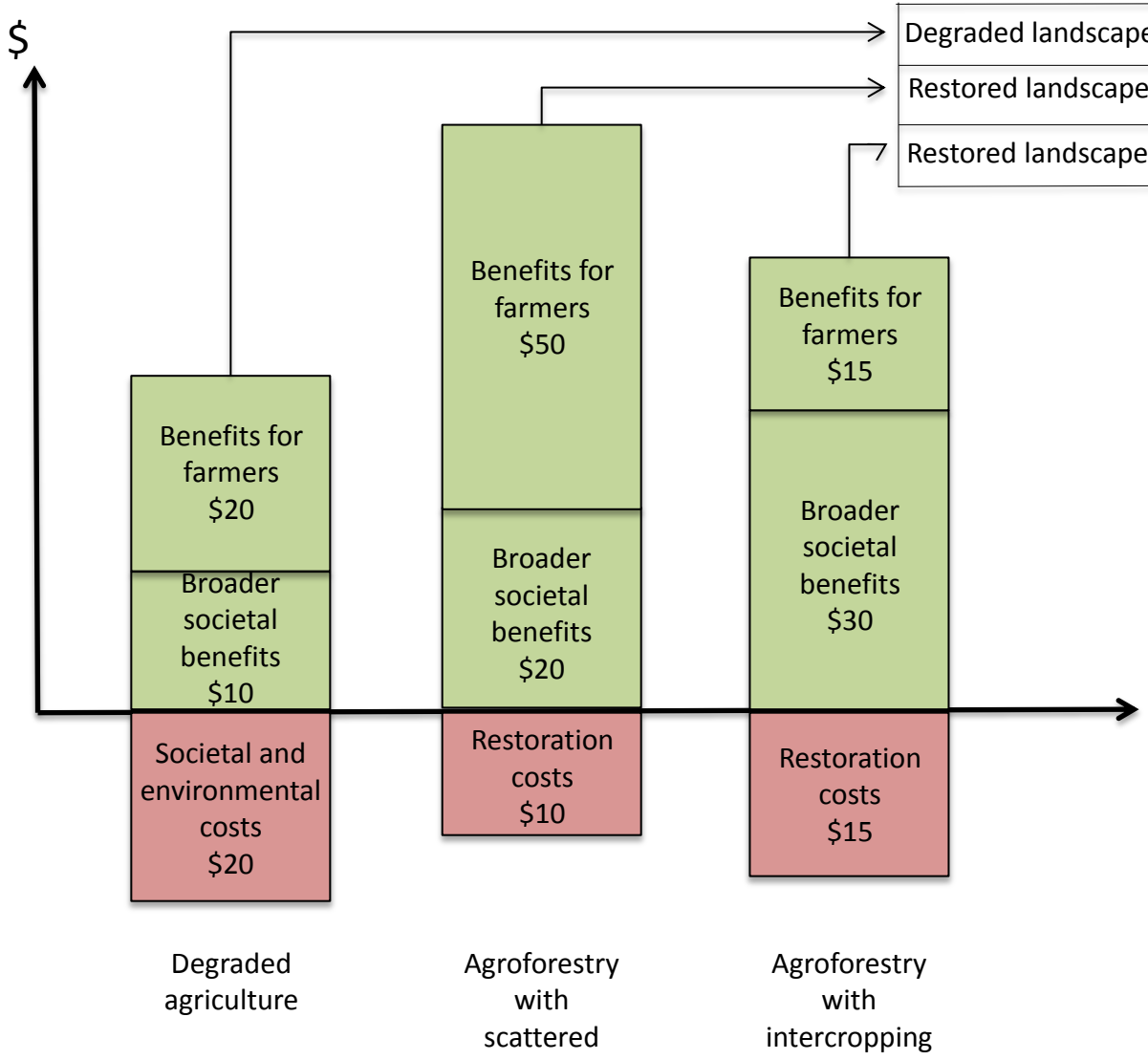
| Land Use | General category of FLR option |
|---|---|
| **Forest land**  | 1. Planted forests and woodlots |
| Suitable for wide scale restoration  | 2. Natural regeneration |
|  | 3. Silviculture |
| **Agricultural land**  | 4. Agroforestry |
| Suitable for mosaic restoration  | 5. Improved fallow |
| **Protective land and buffers**  | 6. Mangrove restoration |
| Suitable for mangrove restoration, watershed protection and erosion control  | 7. Watershed protection and erosion control |

# Restoration aims to empower stakeholders to restore productivity and function



# 3. Clarifying societal and individual costs and benefits of transitions

| | Benefits - costs | Net benefit | Marginal benefit |
|---|---|---|---|
| Degraded landscape | $30 - $20 | $10 | - |
| Restored landscape I | $70 - $10 | $60 | $50 |
| Restored landscape II | $45 - $15 | $30 | $20 |

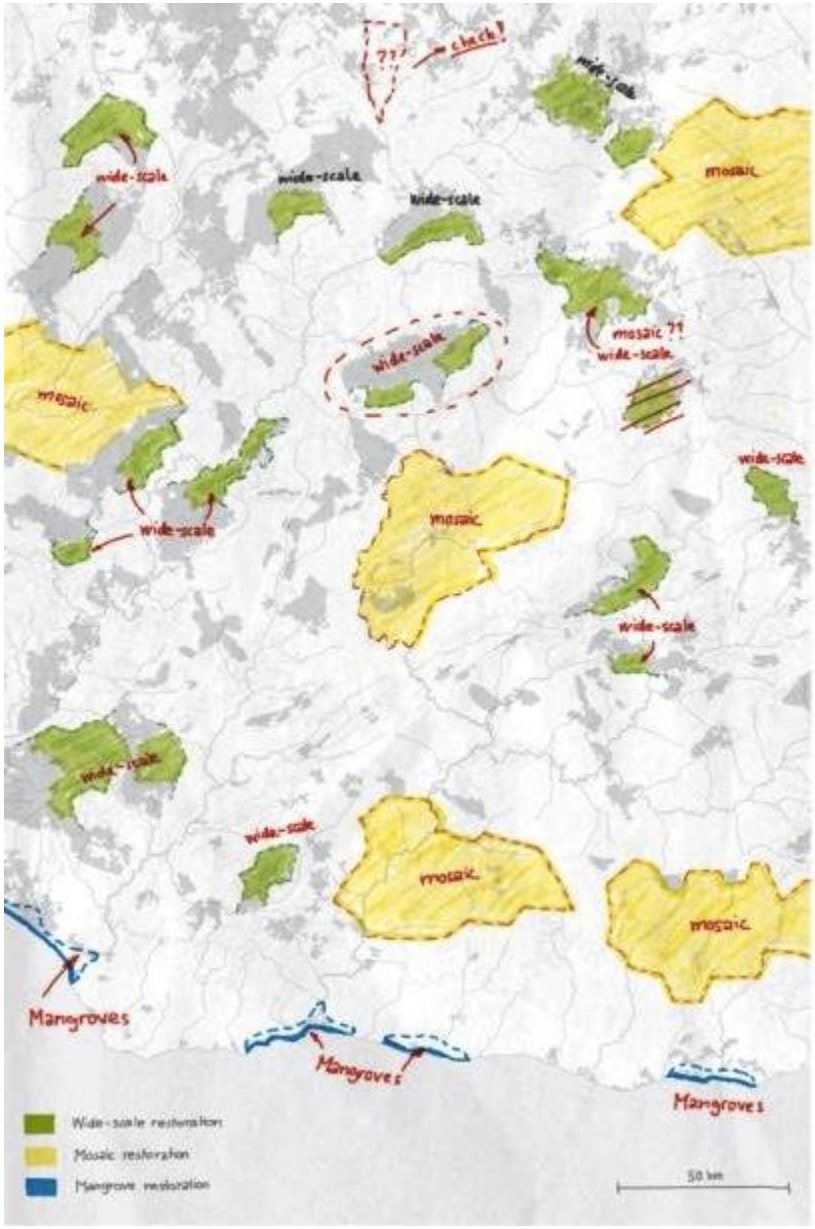


# This involves modeling of many values

- Ecosystems services such as:
  - Timber produced
  - Carbon sequestered
  - Erosion controlled
  - Crop yields improved or sustained
  - Other context dependent services, like water supply (varies by country)

- Revenues and costs estimated with market data and budgeting approach
- With repeated random sampling accounting for uncertainty

# Next step: Sharing the Results

# Some key products of ROAM assessments include

- Identification and engagement of stakeholders
- Defined national or sub-national goals for forest landscape restoration
- Geospatial estimate of total extent of restoration potential
- Types of socially and ecologically feasible restoration interventions by suitable area
- Quantification of the costs and benefits of each intervention type
- Estimated value of additional carbon by intervention type
- Identification of key success factors and strategies for addressing missing factors
- Identification of options and models for investment and financing

# Final step: strategizing for follow-up


**Some examples of uptake and impacts of assessment findings so far include:**

• Used as key source document in the design and submission of Ghana's investment plan for the Forest Investment Programme (FIP)

• Providing the basis of interagency development of a national strategy on FLR for Mexico and Guatemala

• Formed the basis of a Presidential/Cabinet briefing note and shaping the major GEF landscape restoration project in Rwanda

# 3

# Rapid Restoration Diagnostic

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# Look back to look ahead

# Case studies

# South Korea

Before 1960

**Impact**

- Forest cover increased from 35% to 64% of country (1952-2007)
- Forest density increased 14x, population grew 2x, and economy grew 300x (1953-2007)

**Motivate**

- Land slides, flooding, wood shortages
- President Chung-hee made reforestation a national priority
- Big tree planting campaigns

After 2000

**Enable**

- ↓ demand for fuel wood (90% of energy in 1950, 5% by 1980)
- Urbanization
- Strong coordination between government levels

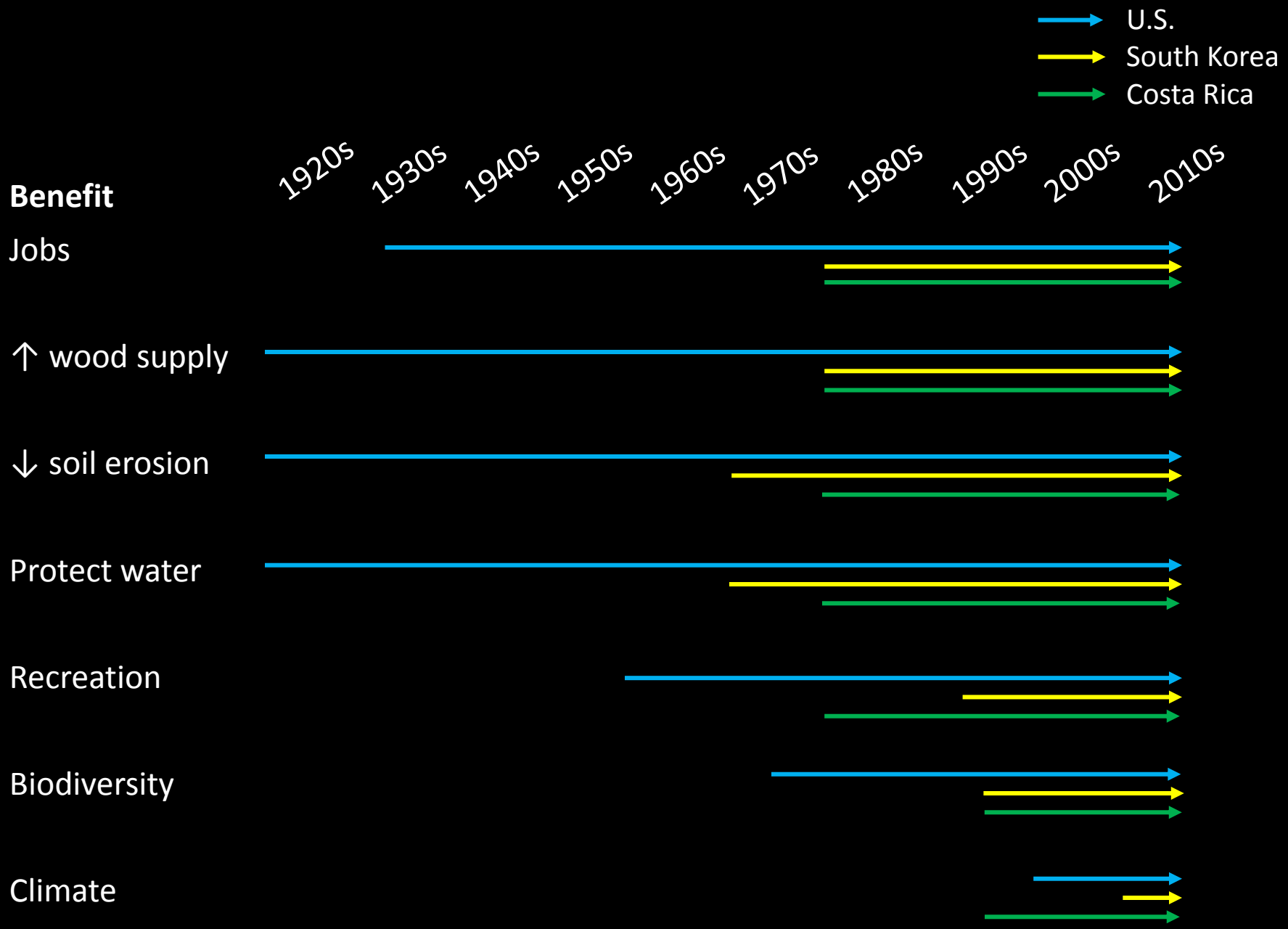
**Implement**

- Series of 10-year reforestation plans (1973-now) with targets, funds, extension, public outreach, and enforcement
- 460 well-paid nursery experts produced 500 million seedlings/year

# NIGER (ZINDER PROVINCE)

| | |
|---|---|
| Impact | • 5 million hectares restored into agroforestry<br>• Improved food security for 2.5 million people |
| Motivate | • Drought (1969-73) and famine (1984, 1988) |
| Enable | • Rural Code reformed to promise farmers “rights to benefits from trees” (1993) |
| Implement | • Regeneration “know how” spread by farmer to farmer |

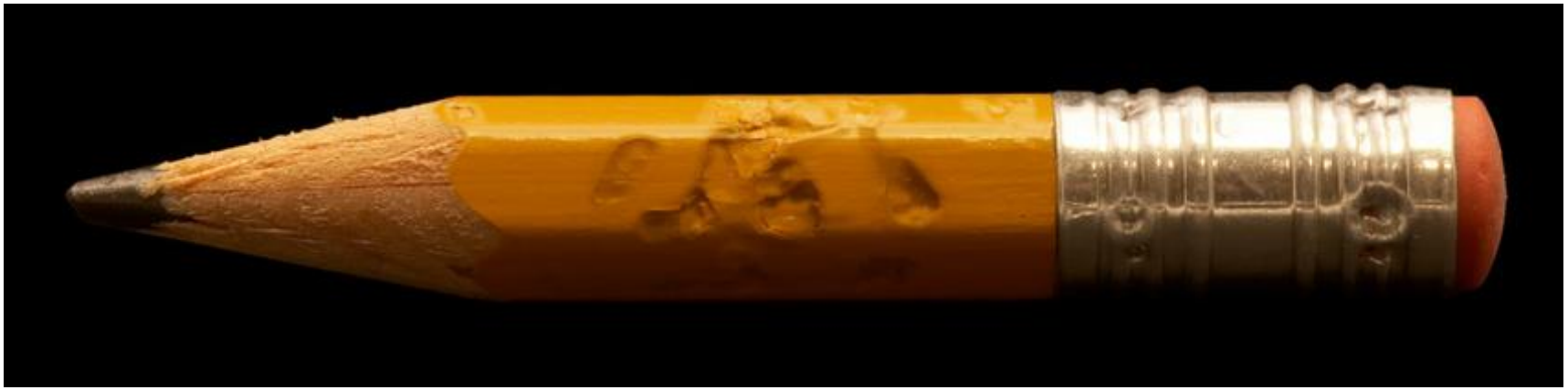
# OBSERVATION : DESIRED BENEFITS CAN EVOLVE



| | | | |
|---|---|---|---|
| Motivate | Benefits | • Restoration generates economic benefits | |
| | | • Restoration generates social benefits | |
| | | • Restoration generates environmental benefits | |
| | Awareness | • Benefits of restoration are publicly communicated | |
| | | • Opportunities for restoration are identified | |
| | Crisis events | • Crisis events are leveraged | |
| | Legal requirements | • Law requiring restoration exists | |
| | | • Law requiring restoration is broadly understood and enforced | |
| Enable | Ecological conditions | • Soil, water, climate, and fire conditions are suitable for restoration | |
| | | • Plants and animals that can impede restoration are absent | |
| | | • Native seeds, seedlings, or source populations are readily available | |
| | Market conditions | • Competing demands (e.g., food, fuel) for degraded forestlands are declining | |
| | | • Value chains for products from restored area exists | |
| | Policy conditions | • Land and natural resource tenure are secure | |
| | | • Policies affecting restoration are aligned and streamlined | |
| | | • Restrictions on clearing remaining natural forests exist | |
| | | • Forest clearing restrictions are enforced | |
| | Social conditions | • Local people are empowered to make decisions about restoration | |
| | | • Local people are able to benefit from restoration | |
| | Institutional conditions | • Roles and responsibilities for restoration are clearly defined | |
| | | • Effective institutional coordination is in place | |
| Implement | Leadership | • National and/or local restoration champions exist | |
| | | • Sustained political commitment exists | |
| | Knowledge | • Restoration “know how” relevant to candidate landscapes exists | |
| | | • Restoration “know how” transferred via peers or extension services | |
| | Technical design | • Restoration design is technically grounded and climate resilient | |
| | Finance and incentives | • Positive incentives and funds for restoration outweigh negative incentives | |
| | | • Incentives and funds are readily accessible | |
| | Feedback | • Effective performance monitoring and evaluation system is in place | |
| | | • Early wins are communicated | |

# CAVEATS

- Factors are inter-related
- Not every case example has everything
- The more factors in place, the greater likelihood of success



# Rapid Restoration Diagnostic: 3 Steps

1. **Select the scope.** Choose the "scope" or boundary within which to apply the Diagnostic. The selected scope will be the "candidate landscape."

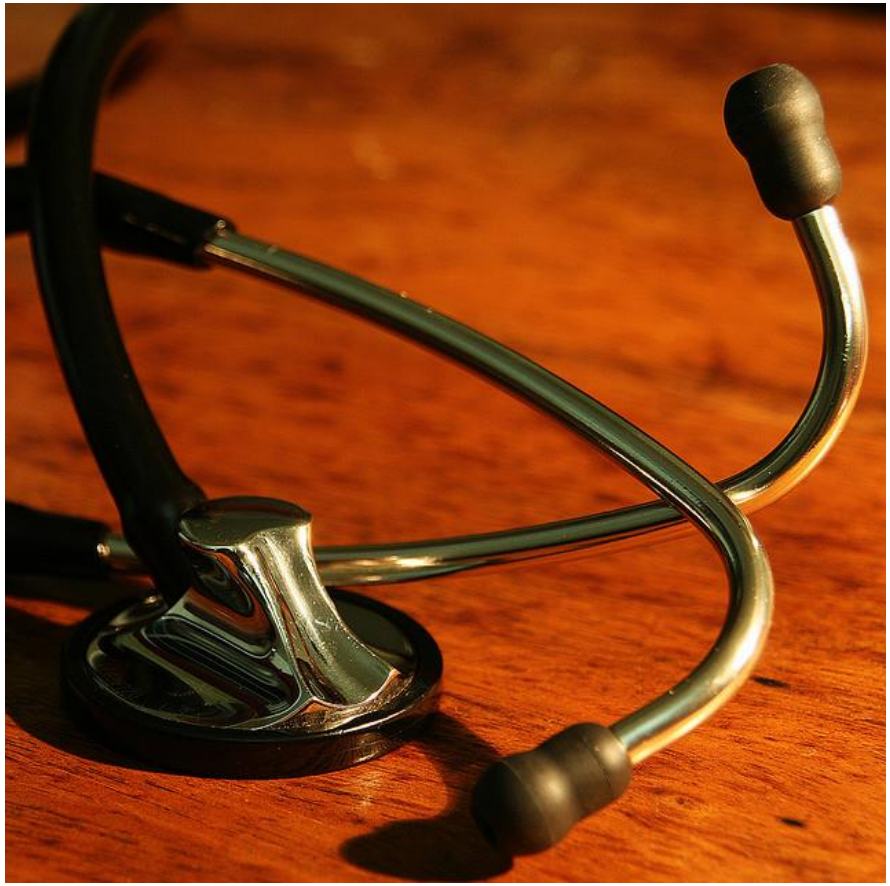
2. **Assess status of key success factors.** Systematically evaluate whether or not key success factors for forest landscape restoration are in place for the candidate landscape.

3. **Identify strategies to address missing factors.** Identify strategies to close gaps in those key success factors that are currently not in place or only partly in place in the candidate landscape.

# 1. Select the scope

- What geographical space?
  - Landscape (country, region, watershed, etc.)
- What time period?
  - Many decades
- What goals?
  - Food, biodiversity, timber, erosion, water, etc

# 2. Assess key success factors



| Theme | Feature | Key success factor |
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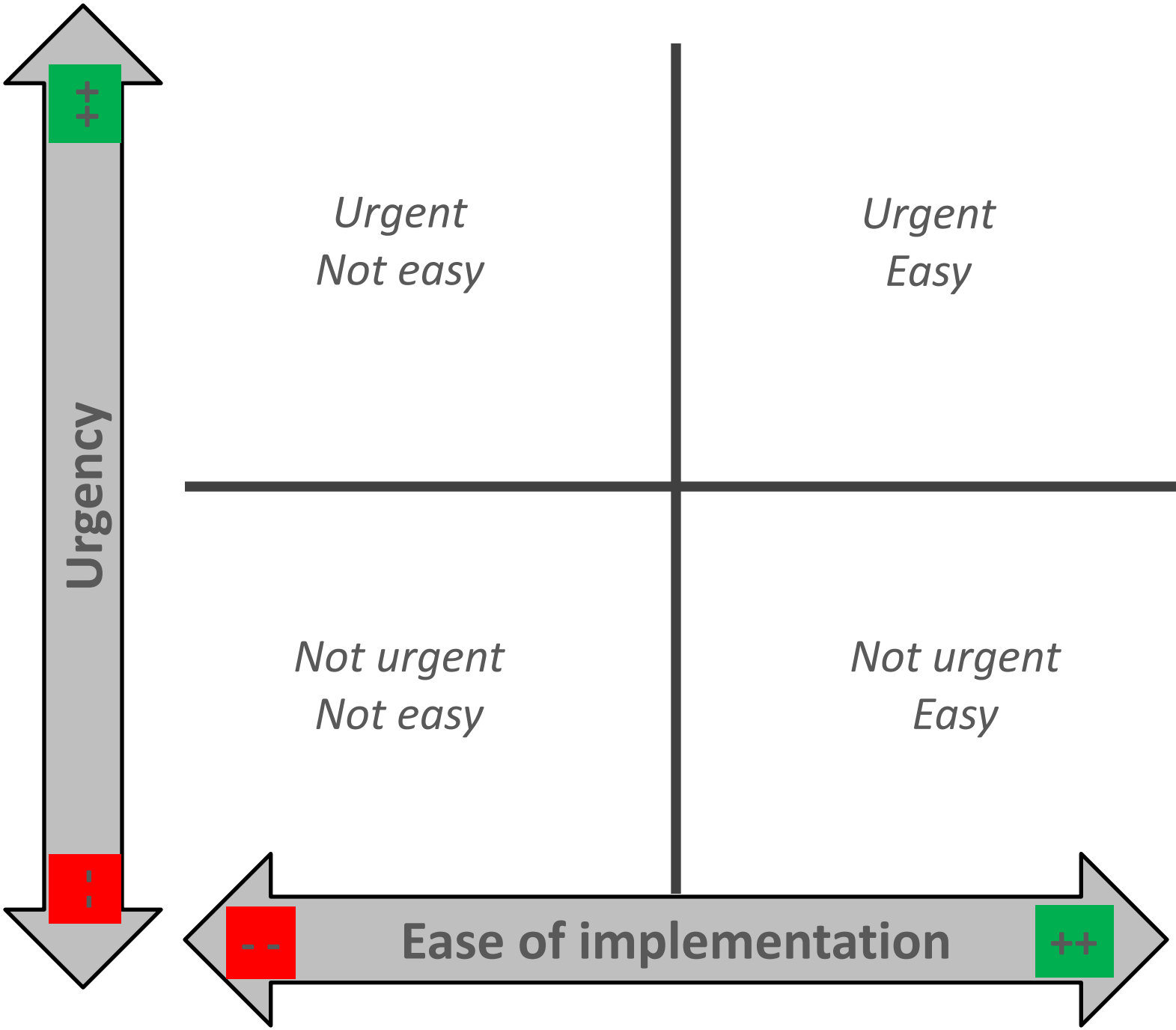
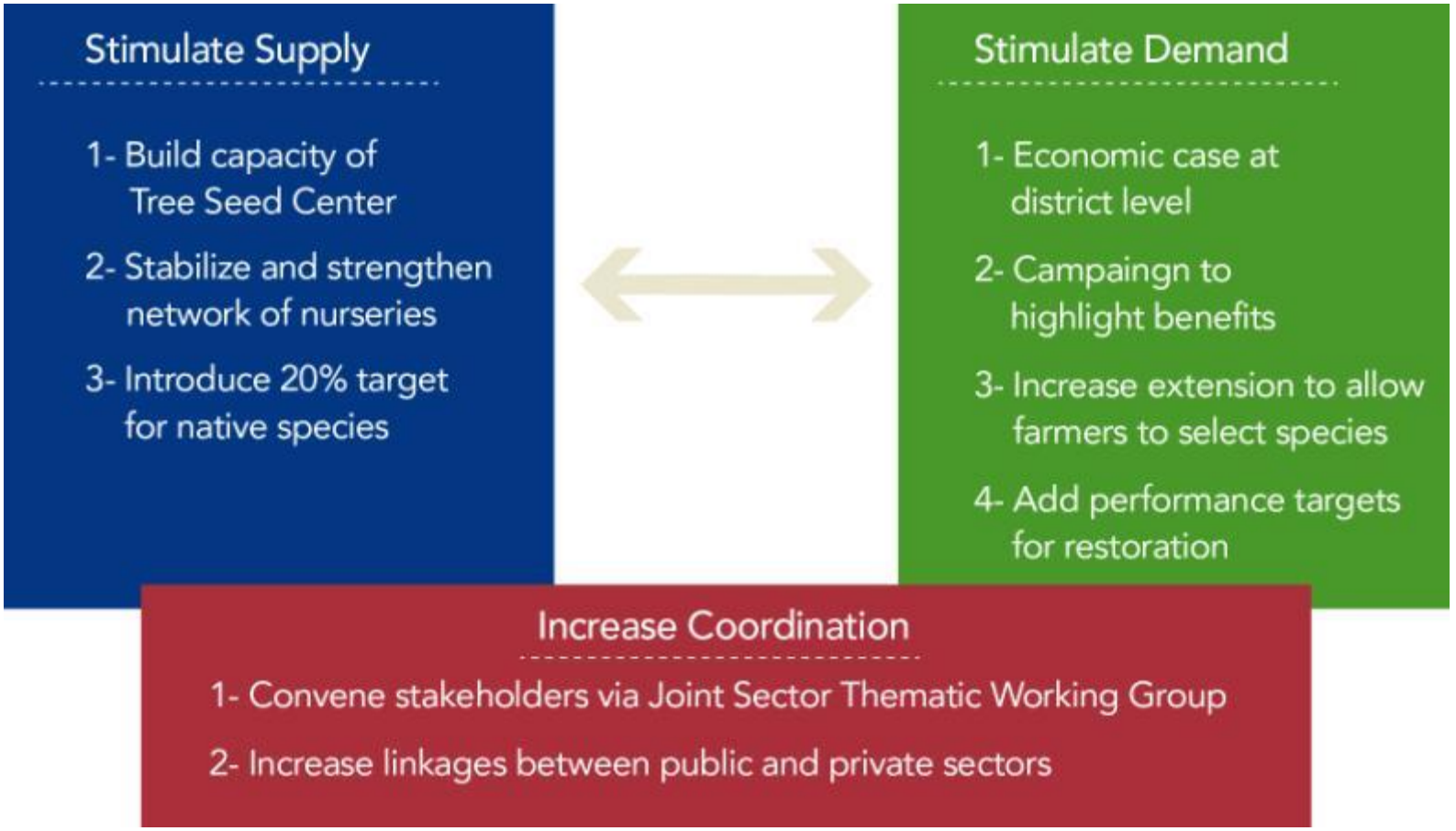
# 3. Identify strategies to address missing factors


++
Urgency
- -
Urgent
Not easy
Urgent
Easy
Not urgent
Not easy
Not urgent
Easy
- -
Ease of implementation
++

# IUCN/WRI Enabling Conditions Diagnostic e.g. Rwanda



# DISCUSSION

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