Restoring Forests and Landscapes

Creating Nature Based Solutions to Human Problems

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Outline

1. There are reasons to be concerned

2. Restoration can help
   - Forests and trees provide nature based solutions
   - The land base of opportunity is large
   - The benefits are many

3. Bright spots abound—how can they be scaled up?
Climate change is affecting the planet

- Average temperatures are increasing
- Sea levels are rising
- Precipitation patterns are changing
- Storm intensity and frequency are increasing
Causes for concern:

Food insecurity

Drought – Indonesia – failed rice crop. Photo: D. Mahendra
Causes for concern: **Food insecurity**

Source: UNEP/Grid-Arendal Vital Water Graphics 2
Causes for concern:

Floods
Causes for concern:
Coastal damage

Typhoon Durian, Philippines. Photo: Oxfam
Causes for concern:
Increased erosion

Yellow River, Shaanxi, China. Photo: Silandi
Causes for concern:

Sea level rise and salinization

Coastal rice paddies, Indonesia  Photo: Flickr/Mangiwau
Causes for concern: Pest outbreaks

Damaged maize field, Kenya.
Photo: CIMMYT.
Causes for concern:
Increasing aridity

Sahel. Photo: J. Brouwer
Nature based solutions:
Restoration is possible!

A resilient landscape
A source of income …
A source of bioenergy …
And more …

Southern Sweden: today and 150 years ago
Deforestation and restoration is nothing new: Forest cover in the U.S. (1620 - today)
How much has been lost?
Area of assessment—the boreal is not included
Potential forest extent—where forests might grow
Current forest extent—where forests grow today
Deforested or degraded lands:
Half of the original forest and woodlands
Forest loss . . .

"Original" forest extent: 5.5 billion ha

Deforested or degraded: 3.0 billion ha

Deforested: 1.5 billion ha
Human pressure on forest landscapes

- Low intensity ag; low population
- Intensive land-use; high population
- Built-up and industrial areas
Wide-scale restoration

sparsely populated areas

lower land-use pressure
Mosaic-type restoration

Population density is higher

Mix of agriculture and other land uses.
Degraded forests and lands: A resource for development and climate
Forest loss . . . and opportunities for restoration

Deforested or degraded: 3.0 billion ha
Deforested: 1.5 billion ha

"Original" forest extent: 5.5 billion ha

- Irrigated crop lands (0.3 billion ha)
- Rainfed crop lands (1.3 billion ha)
- Restoration opportunities – mosaic type (1.2 billion ha)
- Restoration opportunities – wide scale (0.3 billion ha)
Restoration Opportunities by Continent (million hectares)

- Africa
- Asia
- South America
- Oceania
- North America
- Europe

- Total mosaic
- Total widescale
A landscape is a dynamic mosaic in search of balance
Nature based solutions: Restoring for drinking water

West Bengal, India
Photo: M. Aubry
Nature based solutions:
Restoring for power generation
Nature based solutions:
Restoring for shoreline protection

Mangrove planting, Kiribati  Photo: S. Baba
Nature based solutions:
Restoring for food security

Maize farming in a *Faidherbia* agroforest in Mbarali District, Southern Highlands, Tanzania. 2008
Photo: Saidi Mkumbwa
Nature based solutions:
Restoring for food security

*Faidherbia* triples the yield of maize
Zambia, zero fertilizer

<table>
<thead>
<tr>
<th>Year</th>
<th>With Faidherbia</th>
<th>Without Faidherbia</th>
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<tbody>
<tr>
<td>2008</td>
<td>4.1</td>
<td>1.3</td>
</tr>
<tr>
<td>2009</td>
<td>5.1</td>
<td>2.6</td>
</tr>
<tr>
<td>2010</td>
<td>5.6</td>
<td>2.6</td>
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</tbody>
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Number of trials:
- 2008: 15
- 2009: 40
- 2010: 40

Source: World Agroforestry Center
Nature based solutions:
Restoration has other benefits too

- Directly benefits the poor
- Creates rural jobs
- Helps mitigate climate change, (e.g., increases carbon storage in landscapes)
- Sustains biodiversity (and research shows that more diverse ecosystems are more resilient)
- Can be cost effective
Restoration is more than tree planting (illustrative)

- **High**
  - Plantations

- **Low**
  - Managed natural regeneration
  - Spontaneous regrowth

 Restoration opportunity lands, cumulative area
Degraded forests and lands: A resource for development and climate

Shift ag/grazing away from forest

Restore for livelihoods, climate and more