

Presentation

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WORLD
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WEEK

Adapting to Climate Change in Madagascar

Integrating climate information into long term planning for conservation and livelihoods



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Overview

Two Phases:

1. Vulnerability Assessment & Recommendations for Action (2007-2008)
2. 2 year project focused on pilot field implementation of recommendations and policy development (Ongoing)

Goal: Develop an adaptation action plan that facilitates both ecosystem and human adaptation in climate sensitive regions and sectors of the country.

Context

Madagascar – 20 million people, HDI rank 143/177

Over 80% population is rural
Subsistence: Rice, cassava, fisheries

Economic base – Vanilla, Shrimp
Aquaculture, Nature Tourism

Biodiversity Hotspot – 90% of forest cover is already lost

...nonetheless, *Madagascar's unique biodiversity provides multiple ecosystem services like climate regulation and water provision that sustain life on the island*



Integrating Climate Change Information into Land Use Planning & Decision Making Processes

- Durban Vision goal to triple Madagascar's PA network (planning process initiated 2004 to identify new sites)
- Conservation measures such as PA networks need to consider the potential range of species' responses to climate change to ensure continued relevance and effectiveness
- More cost effective to integrate projected future species' ranges now within PAs vs later (Hannah et al, 2007)



Vulnerability Assessment Workshop

- Partnership between CI, Government of Madagascar, WWF, several national and international organizations => broad participation

Objective

- Generate & share relevant climate impacts information
- Identify vulnerability of biodiversity and natural resources-based livelihoods
- Recommend technical and policy actions to enhance resilience and facilitate adaptation for an *integrated biological-human system*

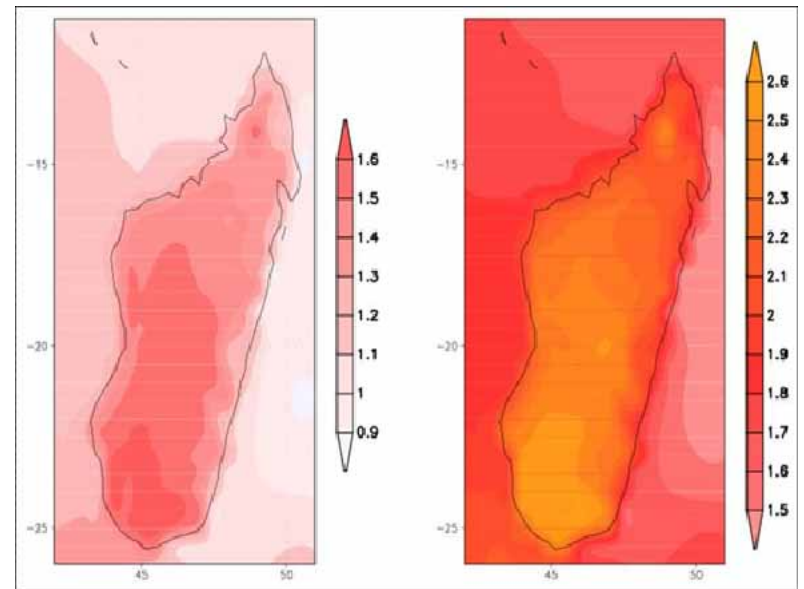


Vulnerability Assessment Process

- **Preparatory work included:**
 - Downscale climate scenarios for Madagascar
 - Community consultations to assess human impacts.
 - Analysis of potential species' range shifts through distribution modeling (2030-2060-2080)
 - Review of long term (>20 years) species' population data to id any trends associated with observed climate
 - Literature Review to consolidate state of published knowledge

Results: Projected Climate Change and Species' Response

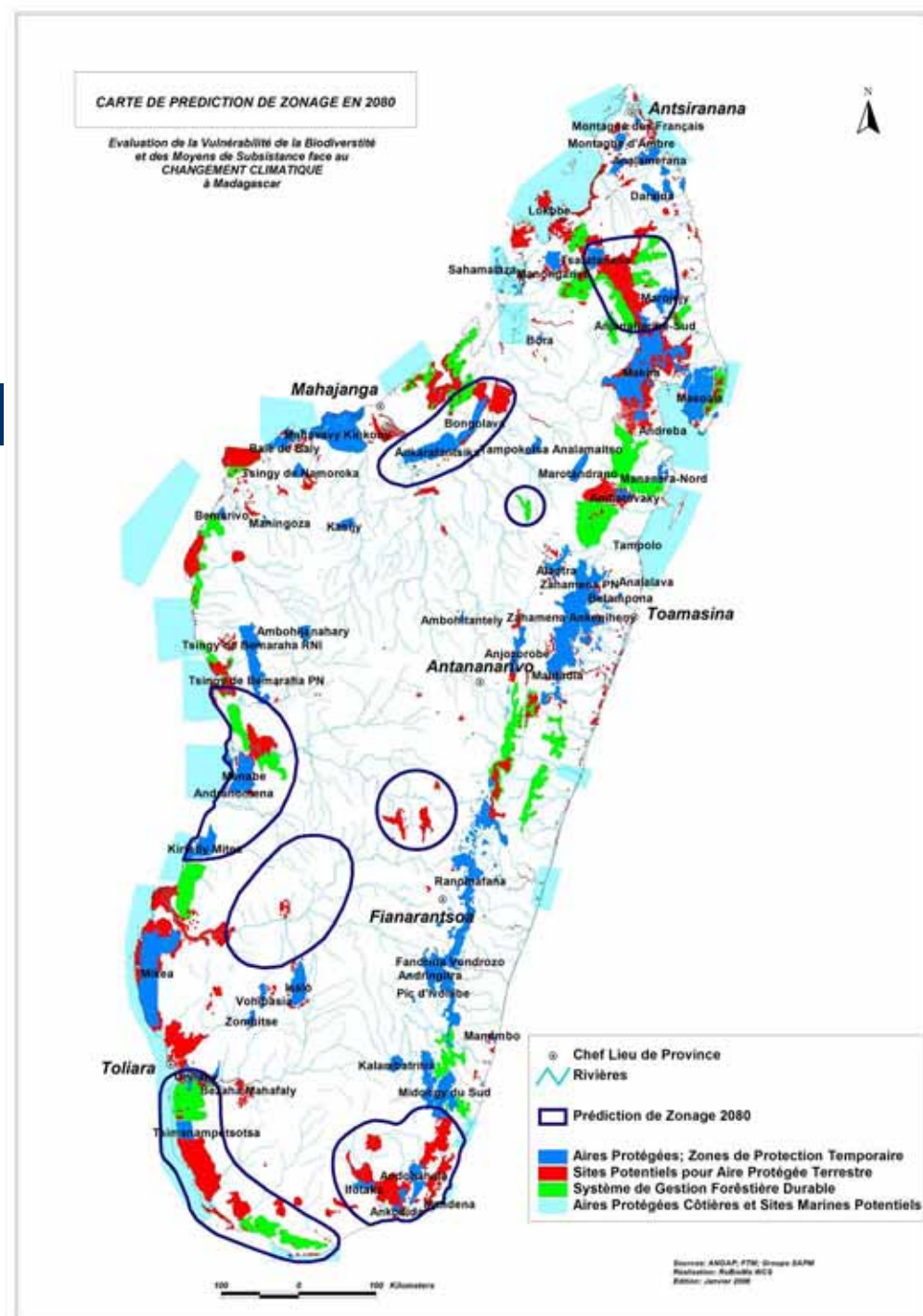
- Humid, fragmented eastern forests to become dryer, with species range losses, especially in south
- Hot, dry south to become much hotter, but low to moderate species range losses
- Hot, dry northwest to become wetter; pronounced range displacement, with upslope regions gaining in richness, depending on forest connectivity



Projected Temperature Changes
(minimum and maximum 2046-2060)

Areas of highest priority

- Some areas were identified as high priorities for protection, either because of their **vulnerability** or **resiliency**
- *Resilient coral reef area: Ambodivahibe Bay in NE Madagascar*



Areas of high importance for livelihoods

- Areas identified with high ecosystem service values
- Areas of potential conflict as climate change increases pressures on people and natural habitats



Recommended Actions to Reduce Ecological Impact of Climate Change

- **Protect** all remaining natural habitats (only about 5 million hectares of 9.3 million hectares of forests will be protected within PAs)
- **Restore** connectivity in fragmented forests
- Restore and **protect riverine forest corridors**
- Manage remaining natural forest for species' response to climate change

Actions to Reduce Ecological Impact of Climate Change

- Identify resilient areas to include in the marine protected area network (e.g. Ambodivahibe)
- Adopt integrated coastal zone management
- Creation of a network of marine protected areas including all habitats



Livelihood recommendations

- Clarify land tenure in areas around high biodiversity areas
- Ecologically-sensitive agricultural intensification
- Micro-credit mechanisms
- Regular risk assessments
- Identification of triggers for climate stress-induced migration
- Climate resilient infrastructure



Ongoing – Feasibility Studies and Pilot Implementation

- Scale up ecological restoration activities in critical areas including important riverine forests
- Understand climate impact on staple crops and consequential impact on biodiversity and ecosystem services (e.g. potential for increase threat of deforestation)
- Identify sustainable livelihood strategies that enhance community resilience
- Identify marine resilient areas for inclusion within marine protected area network planning and creation

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Thank you!

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