REDD+ and spatial planning:
Using maps to exploring benefits and costs of REDD+

Charlotte Hicks, UNEP-WCMC

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Outline

This presentation will provide an overview of the project we are undertaking, and role of spatial in supporting REDD+ planning:

1. Background

2. Using spatial information to support REDD+ planning

1. Background

REDD+

REDD+

= Reducing emissions from
Deforestation and forest Degradation

+

Conservation of forest carbon stocks
Sustainable management of forests
Enhancement of forest carbon stocks

- REDD+ is an international initiative to combat climate change by changing the ways in which forests are used and managed, so that emissions of GHG from forests are reduced and carbon sequestration is increased.
- REDD+ may require different actions, such as protecting forests from fire or illegal logging or rehabilitating degraded forest areas.

REDD+ actions

Activity	Example actions
Reducing emissions from deforestation	Eg: reduce conversion pressure through improved land-use planning
Reducing emissions from forest degradation	Eg: sustainable NTFPs harvesting/production; fuelwood alternatives/efficient cookstoves
Conservation of forest carbon stocks	Eg: reinforcing existing protected areas
Sustainable management of forest	Eg: reduced impact logging; community forestry
Enhancement of forest carbon stocks	Eg: forest rehabilitation; afforestation

UN-REDD Programme

- UN-REDD = United Nations collaborative initiative on Reducing Emissions from Deforestation and forest Degradation (REDD) in developing countries.
- Started in 2008; joint programme of UNDP, FAO, UNEP
- Supports national REDD+ readiness efforts in 56 partner countries
- Cambodia started its UN-REDD National Programme in 2011; its goal:

> To support Cambodia to be ready for REDD+ implementation, including development of necessary institutions, policies and capacity.

Introduction to UNEP-WCMC

- United Nations Environment Programme World Conservation Monitoring Centre

- Provide support to UN-REDD partner countries on Safeguards & Multiple Benefits:
  - Planning for REDD+ that achieves multiple benefits, including using mapping and other tools, e.g. economic analyses
  - Developing country approaches to safeguards

- Close collaboration with in-country partners, FAO & UNDP; focus on capacity building & participatory approaches

UNEP-WCMC – Cambodia collaboration

- Previous work on mapping REDD+ co-benefits (2010)

- In 2014, started exploring REDD+ costs-benefits analysis

- Current collaboration will estimate costs & benefits of implementing REDD+ and to develop and trial for selected khaet a REDD+ economic & GIS tool.

- Involves:

  ➢ Develop costs-benefits analysis tool (Excel-based)

  ➢ Populate with data from two khaet (Koh Kong & Mondulkiri)

  ➢ Develop GIS tool to combine spatial & economic data for the two khaet

  ➢ Build capacity to develop and use the tools

 ➢ Provide information to inform REDD+ planning

2. Using spatial information to support REDD+ planning

Decision-support tools and analyses

Numerous tools, analyses and studies support planning for REDD+. For example:

- Analysis of drivers of deforestation and forest degradation

- Valuation studies

- Spatial analysis / mapping

- Stakeholder consultations and participatory approaches
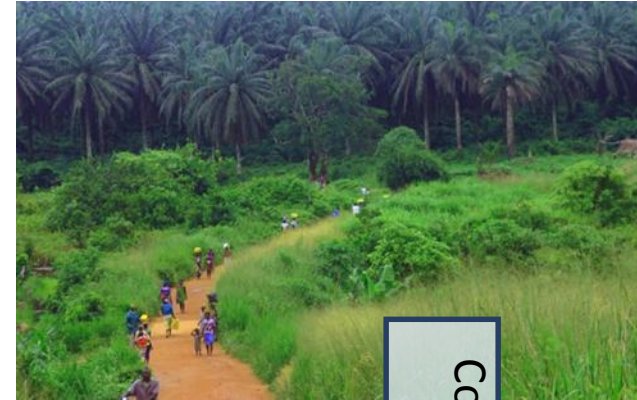
- Costs-benefits analysis
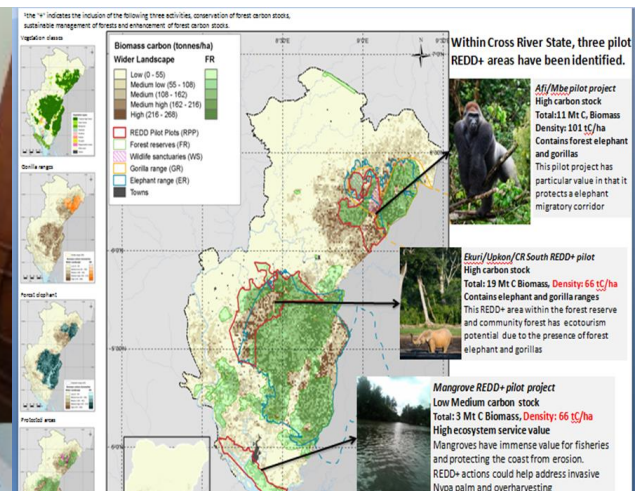
Maps as decision-support

- Map-making is not itself a planning process

- Maps can be used as **decision-support tools** for REDD+, helping planners and stakeholders to:
  - Understand context for REDD+ planning (e.g. maps of forest cover, land use, current/planned development, population distribution)
  - Analyze suitability of different areas for different types of REDD+ actions, and for competing land uses
  - Identify potential benefits and risks associated with REDD+ implementation

- Can and should be used together with other tools and approaches

Different REDD+ actions may be implemented in different areas

forest patrolling

Community foestry

reforestation

Forest cover/carbon stocks

Total Carbon (tonnes/ha)
- Low (0 - 130)
- Medium low (131 - 233)
- Medium (234 - 292)
- Medium high (293 - 331)
- High (332 - 410)

Recent Deforestation
- 2006 - 2009
- 2003 - 2006
- 2000 - 2003

For example: Carbon stocks and areas of recent deforestation (2000-2009) in Central Sulawesi
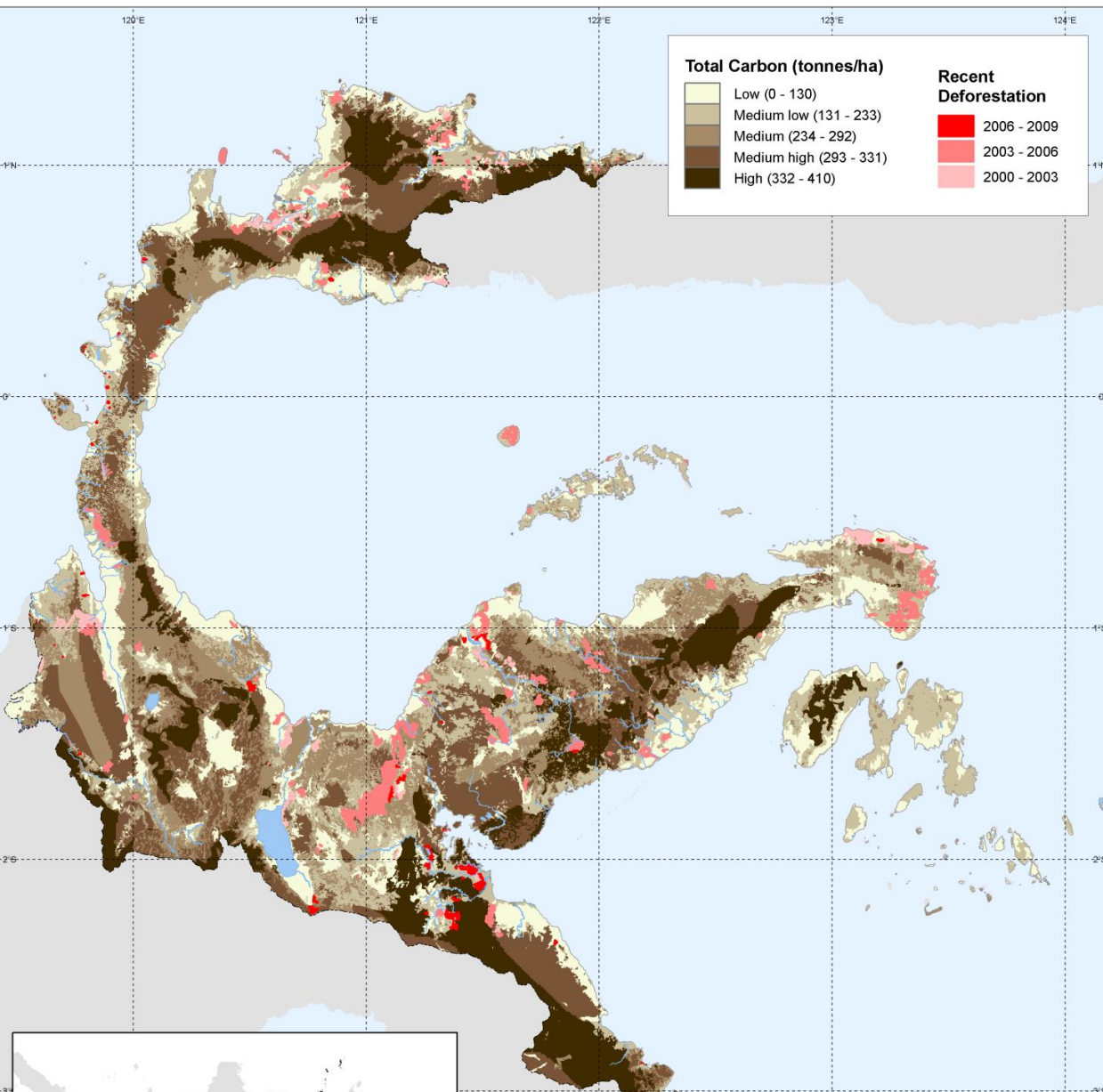
To **assess land-cover change (including forest cover loss)** quantitatively and identify possible priority areas for REDD+ actions to reduce emissions from deforestation

Pressures on forests

Woody above-ground biomass carbon
outside / within natural forest *

Gas and oil exploration

For example: Current oil and gas exploration licenses, applications and open acreage in Tanzania, with carbon and natural forests
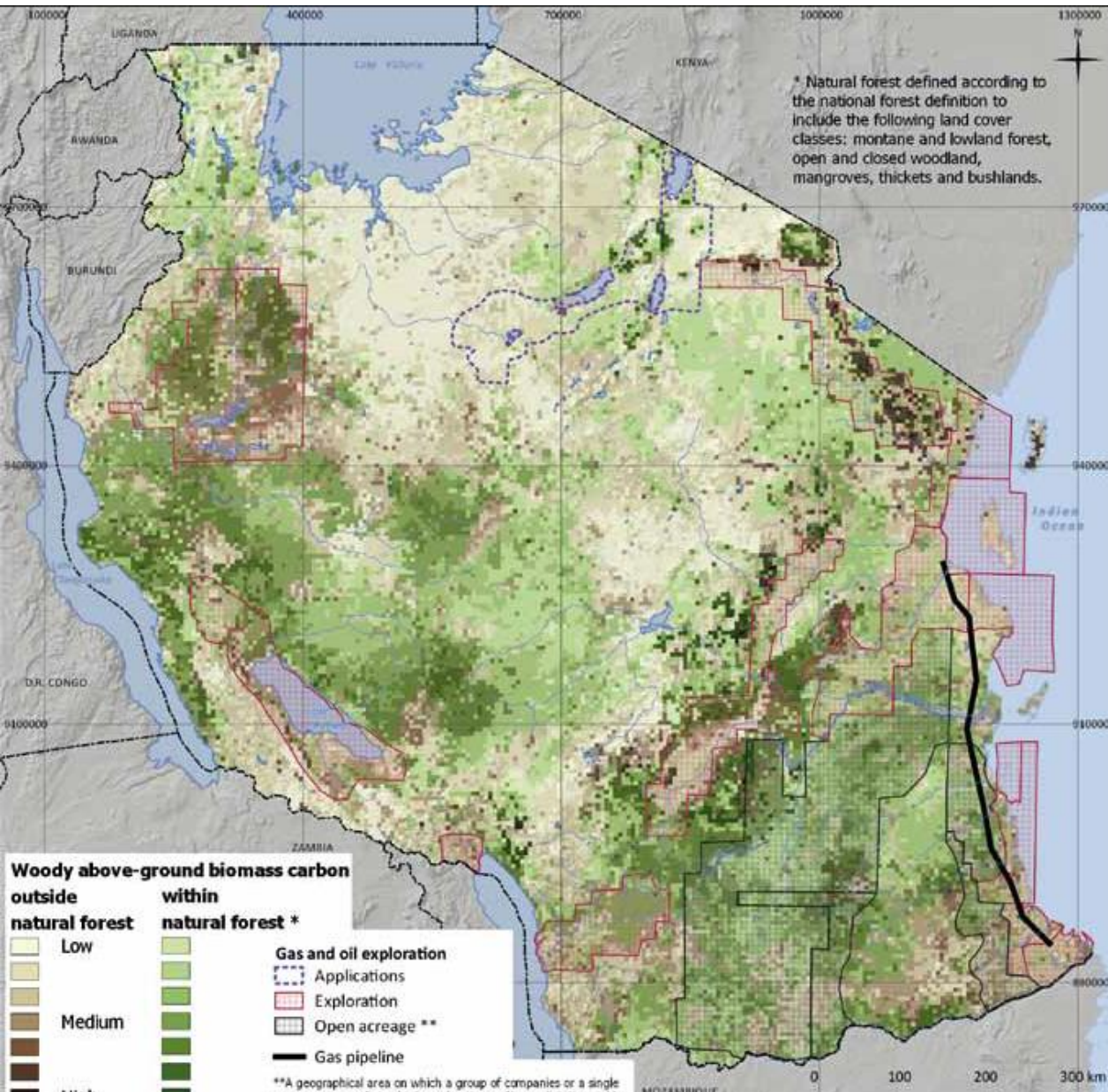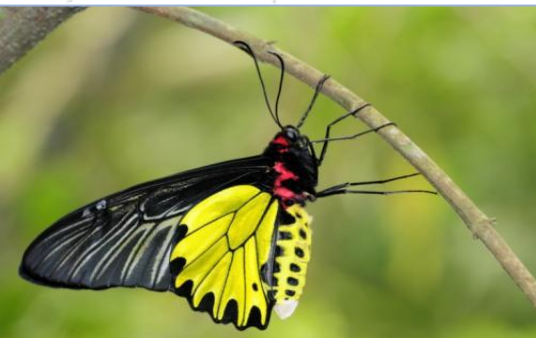
REDD+ planning should take account of **pressures**, which affect where REDD+ implementation is feasible and the type of actions.

Potential **benefits** and **risks** of REDD+ depend on where and how actions are implemented

forest patrolling

Community forestry

reforestation

Multiple benefits of REDD+

• While main aim of REDD+ is to reduce GHG emissions and increase CO_2 sequestration from the atmosphere, it has the potential to deliver additional benefits ('co-benefits')

• Multiple benefits of REDD+ are all of these benefits – social and environmental – that may result from the implementation of REDD+. For e.g.:

- Enhancement of ecosystem services
- Biodiversity conservation
- Livelihoods and social benefits
- Clarified tenure and improved governance of natural resources

Benefits vary geographically

Biodiversity and ecosystem services distributed unevenly across space; spatial data helps identify areas important for different benefits and combinations of benefits

Biomass carbon stocks

Importance for biodiversity

Importance for tourism

Importance for soil erosion control

Benefits can be overlaid
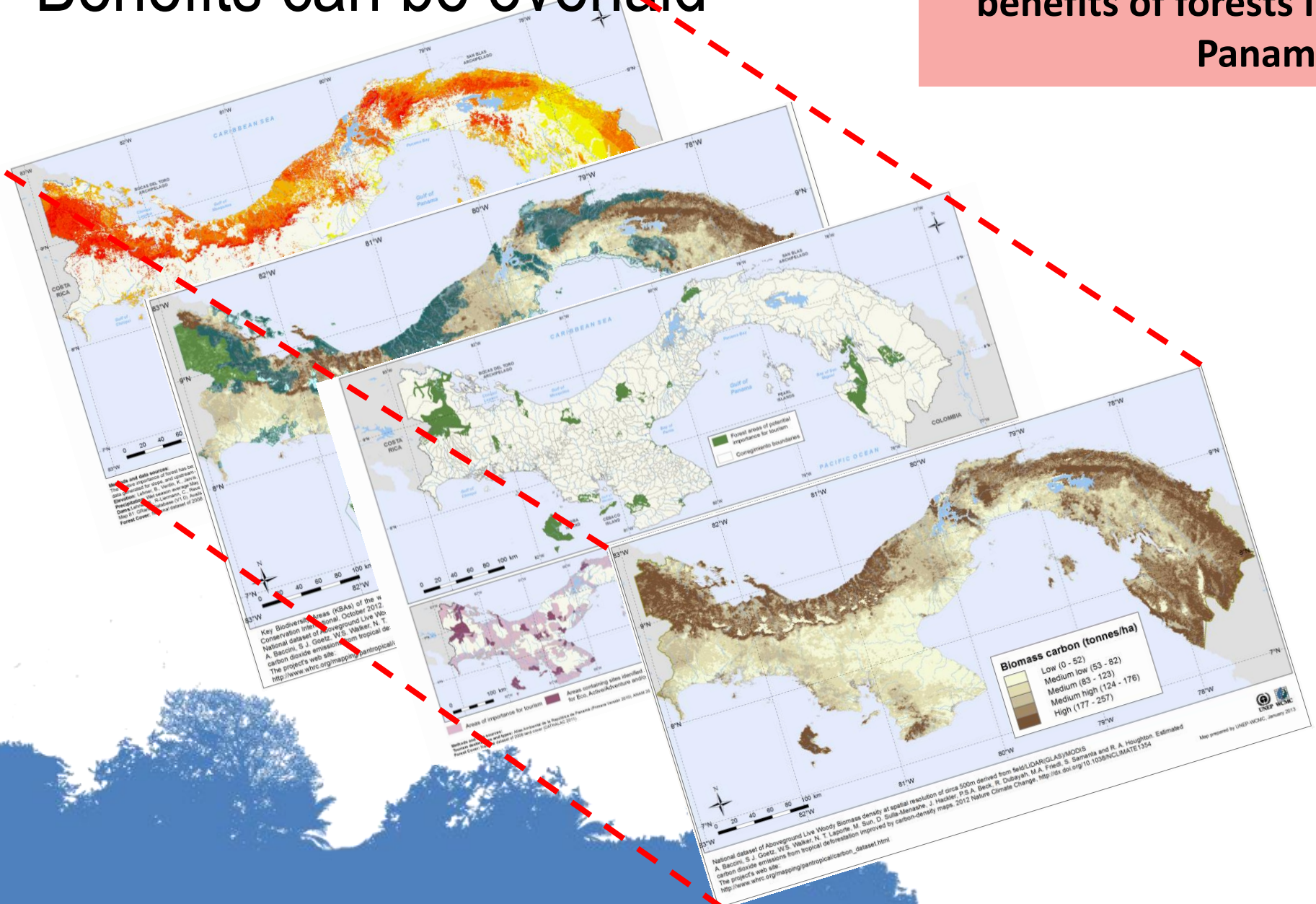
Potential risks of REDD+

- REDD+ also carries potential risks, which depend on specific actions, as well as national and local contexts:
  - Environmental risks could include:
    - Conversion of degraded natural forest or other ecosystems to plantations
    - Displacement of pressures to areas important for biodiversity or ecosystem services
  - Social risks could include:
    - Reduced access to resources for forest users
    - Inequitable sharing of REDD+ benefits
    - Conflicts over land
    - Displacement of forest dependent communities

For example: Important wildlife corridors, protected areas, natural forest and woody biomass carbon in Tanzania

- Safeguard (e) notes REDD+ activities are not to be used for the conversion of natural forests

- Distinguishing natural forest areas and areas important for biodiversity helps to reduce risk of conversion

* Defined according to the NAFORMA and FAO FRA classification system to include the following land cover classes: montane and lowland forest, open and closed woodland, and mangroves.

Burigi - Akagera
Kilimanjaro - Natron
Kilimanjaro - Amboseli
Burigi - Kigosi
Burigi - Moyowosi
Manyara - Natron
Manyara - Ngorongoro
Tarangire - Simanjiro
Tarangire - Manyara
Simanjiro - Tarangire
Gombe - Ugalla
Swagaswaga - Mkungureno
East Usambara - West Usambara
Nilo - Amani
Wamimbiki - Masai steppe
Muhezi - Swagaswaga
Mahale - Katavi
Wamimbiki - Saadani
Katavi - Rukwa
Wamimbiki - Mikumi
Wamimbiki - Saleous
Uluguru south - Uluguru north
Udzungwa - Ruaha
Lukwati - Rungwa
Udzungwa - Mikumi
Udzungwa - Kilombero
Udzungwa - Saleous
Kalambo - Loasi
Rungwe - Kitulo
Saleous - Niassa

Area under protection
Wildlife corridors

Biomass (tonnes/ha)

wider landscape	within natural forest *
0 - 10	0 - 10
10 - 20	10 - 20
20 - 30	20 - 30
30 - 40	30 - 40
40 - 50	40 - 50
50 - 80	50 - 80
80 - 366	80 - 366

Planning for costs of REDD+

In addition to benefits and risks, there are also economic costs associated with REDD+:

Costs of REDD+

Opportunity

Costs of potential income foregone from 'business as usual' land use

Implementation

Variable costs associated with implementing actions, e.g:

- Investment at the beginning ('up-front costs')
- Annual expenses

Transaction

Costs of starting and maintaining a REDD+ programme

- Development costs
- Costs of bureaucratic processes (e.g. procurement)

What types of spatially explicit economic information can be used to plan for REDD+?

- **Opportunity costs, implementation costs, transaction costs -** can vary across a landscape

- **Value of benefits lost/preserved -**
- Mitigation of soil erosion
- Production of NTFPs
- Nature-based tourism
- Pollination of crops

- **Potential carbon income**
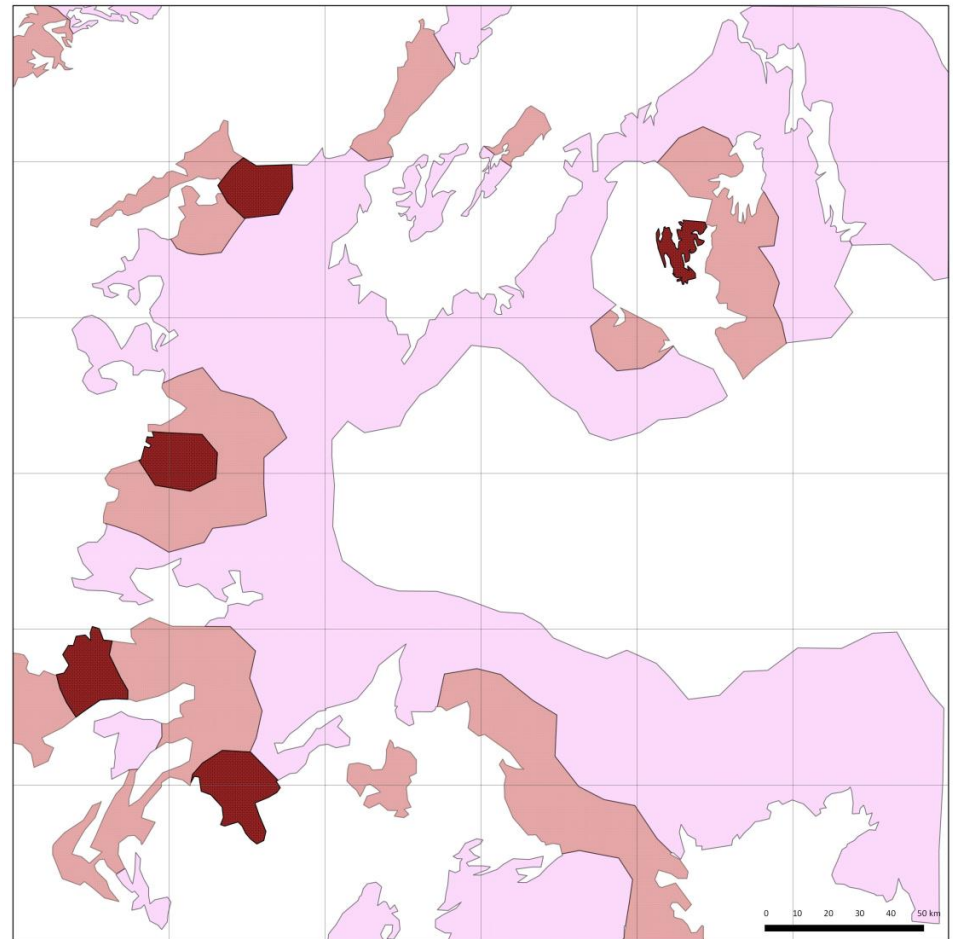
Map prepared by UNEP-WCMC. Date: July 2014.

Costos de implementación
- Alto ($20,155/km2)
- Medio ($13,440/km2)
- Bajo ($6,720/km2)

0 10 20 30 40 50 km

How can mapping help to identify priority areas for REDD+ actions?

- Based on existing conditions, where are the areas where REDD+ actions **can** be implemented?

- Which areas are under **pressure**?

- Which areas would **maximize benefits, mitigate risks and reduce costs**?

- Are there areas that should be **included or excluded**?
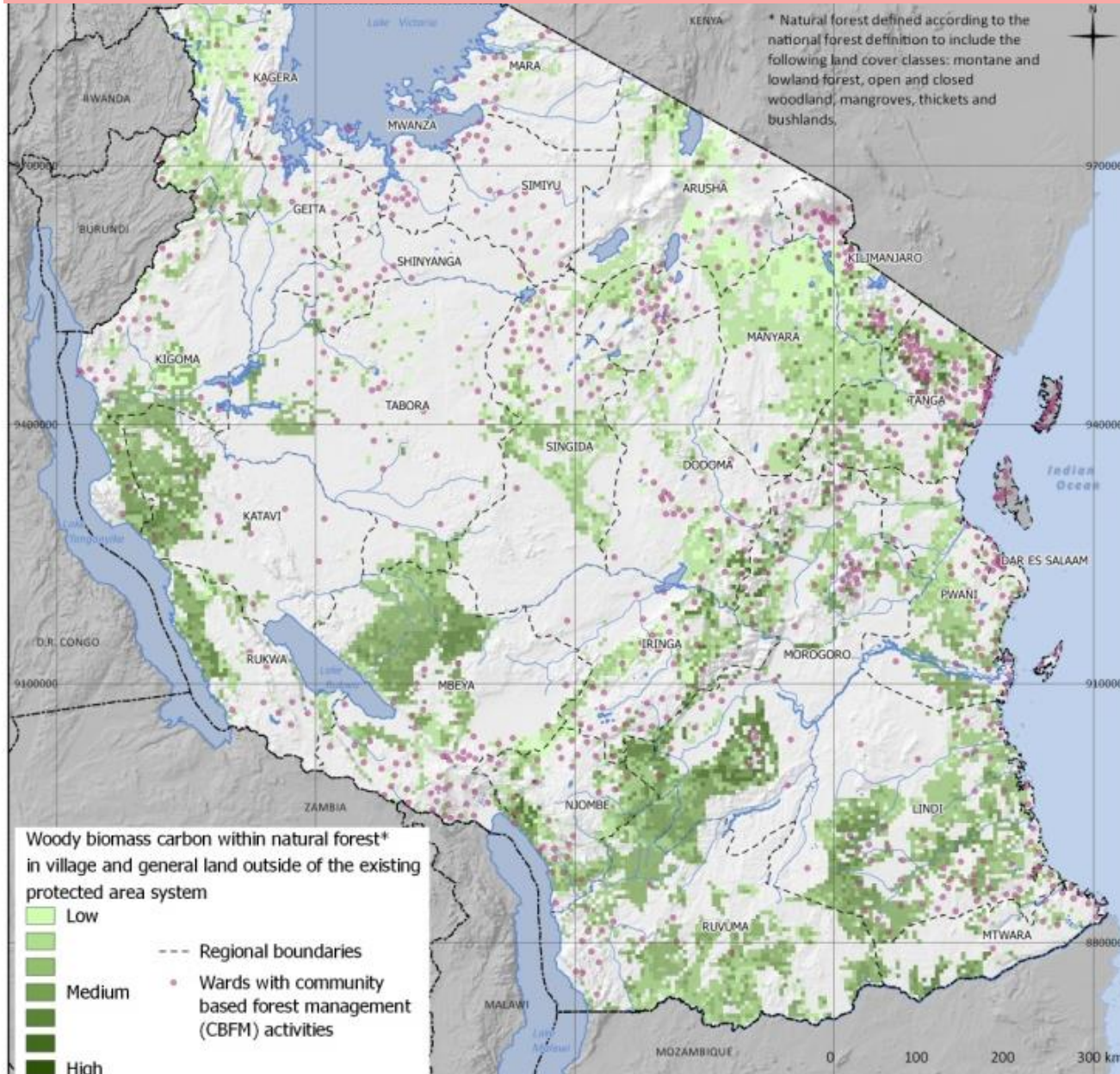
* Extending CBFM identified as important REDD+ action for **sustainable management of forests** in Tanzania

* Map shows natural forest and wards with existing CBFM

Summary: the role of spatial analysis in planning for REDD+

- Spatial analysis provides **decision support** for REDD+ planning, among other tools and approaches

- Spatial analysis can help plan for REDD+ that is **feasible, enhances potential benefits, reduces potential risks and minimizes costs**

- Spatial analysis can also help planners and stakeholders to **identify suitable REDD+ actions and priority zones** for those actions

- Important to **integrate stakeholder priorities and needs** into wider consultation and planning processes for REDD+, including spatial analysis processes

- UN-REDD Programme/other initiatives provide **guidance on tools, methodologies and other resources** for spatial planning, and case studies from countries/states designing and implementing REDD+

Thank you!

charlotte.hicks@unep-wcmc.org