



Integrated land use planning for REDD+ - using workflows and other supporting tools

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Outline

1. Recap: integrated land use planning and REDD+
2. Role of spatial analysis in REDD+ planning
3. Planning workflows
4. Tools to support this process





1. Recap – Integrated land-use planning & REDD+

Integrated land use planning

- Integrated land use planning can help us to plan for multiple objectives in a landscape and meet the Sustainable Development Goals.
- Planners consider a range of economic, environmental and social development goals and land-use activities, aiming to achieve a 'triple bottom line'. Stakeholders from multiple sectors and backgrounds are engaged in the process.

Spatial analysis

- The process of examining the locations/attributes/ relationships of features in spatial data; using overlay and other techniques to address a question
- Extracts/creates new information from spatial data (e.g. analysis of changes in forest cover between two periods).

REDD+

- International initiative to combat climate change by reducing deforestation and changing how forests are used and managed.
- Main aim to reduce GHG emissions and increase carbon sequestration, and can be implemented through a range of actions



2. Role of spatial analysis in REDD+ planning

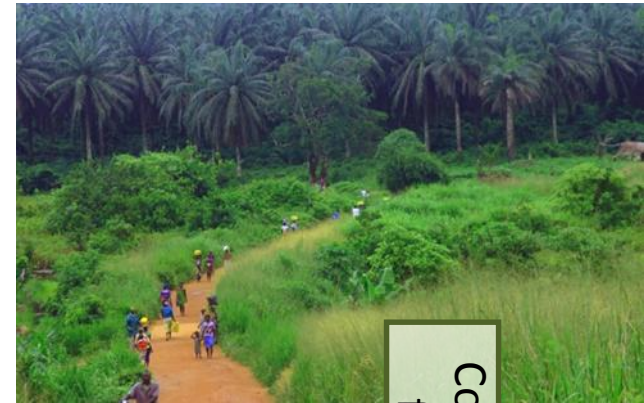
Spatial analysis to support REDD+ planning

- The extent to which REDD+ can contribute to multiple goals in a landscape varies substantially, depending on:
 - Where the activities are located?
 - How they are designed and implemented?
 - What are the alternative land-uses?

Different REDD+ actions may be implemented in different areas



forest patrolling



Community forestry



reforestation



Food and Agriculture Organization of the United Nations



Empowered lives. Resilient nations.



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



Food and Agriculture Organization of the United Nations



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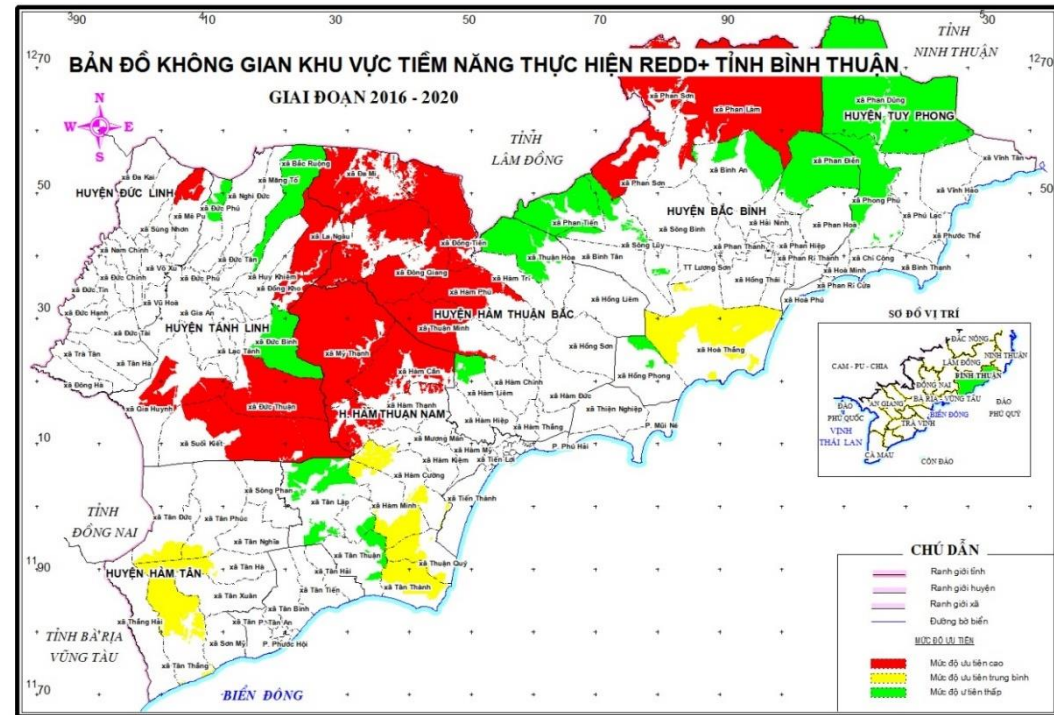


Maps can be **decision-support tools** for REDD+, helping to:

- Understand extent and distribution of forest and landcover types, as well as pressures, and visualize overlap between factors
- Identify feasible actions and priority locations for actions
- Identify opportunities to enhance benefits from actions, reduce risks and minimize costs
- Negotiate land- and forest-use solutions among stakeholders/sectors
- Inform development of implementation/action plans

Combining spatial information can help planners to identify priority areas for actions

- Based on existing conditions, where can actions/initiatives be **feasibly** implemented?
- Which areas are under **pressure** from drivers of change?
- In which areas can we secure multiple goals, e.g. **enhance benefits, mitigate risks**?
- Are there particular areas that should be **included or excluded**?



Cơ quan xây dựng bản đồ: Phân viện Điều tra Quy hoạch Rừng Nam Bộ
Hoàn thành tháng 1 năm 2016

Important considerations

- Decisions are taken by end-users, by planners & stakeholders; decisions are not made by maps
- Spatial analysis needs to be integrated into participatory processes where stakeholders are engaged and involved in planning
- A clear planning questions helps to inform spatial analysis
- Types and detail of spatial analysis depends on data availability/accessibility and accuracy
- Not all data and planning factors can be mapped or should be mapped
- Capacity building for technical staff, planners and stakeholders in creating and using maps is beneficial



3. Planning workflows

Planning workflows

- A robust and participatory planning process is vital for integrated land use planning, including for REDD+



So how to plan where to implement REDD+ and other forest-related actions?

Key questions: Where **can** the action be undertaken? Where **can't** the action be undertaken?

Criteria to consider:

- What is the driver/problem you want to address?
- Is forest management category is relevant? If so, which one should be prioritised?
- Is forest/land condition relevant? E.g. poor/degraded forest, rich forest, deforested areas
- Is forest type relevant? E.g. evergreen, mixed, bamboo, etc

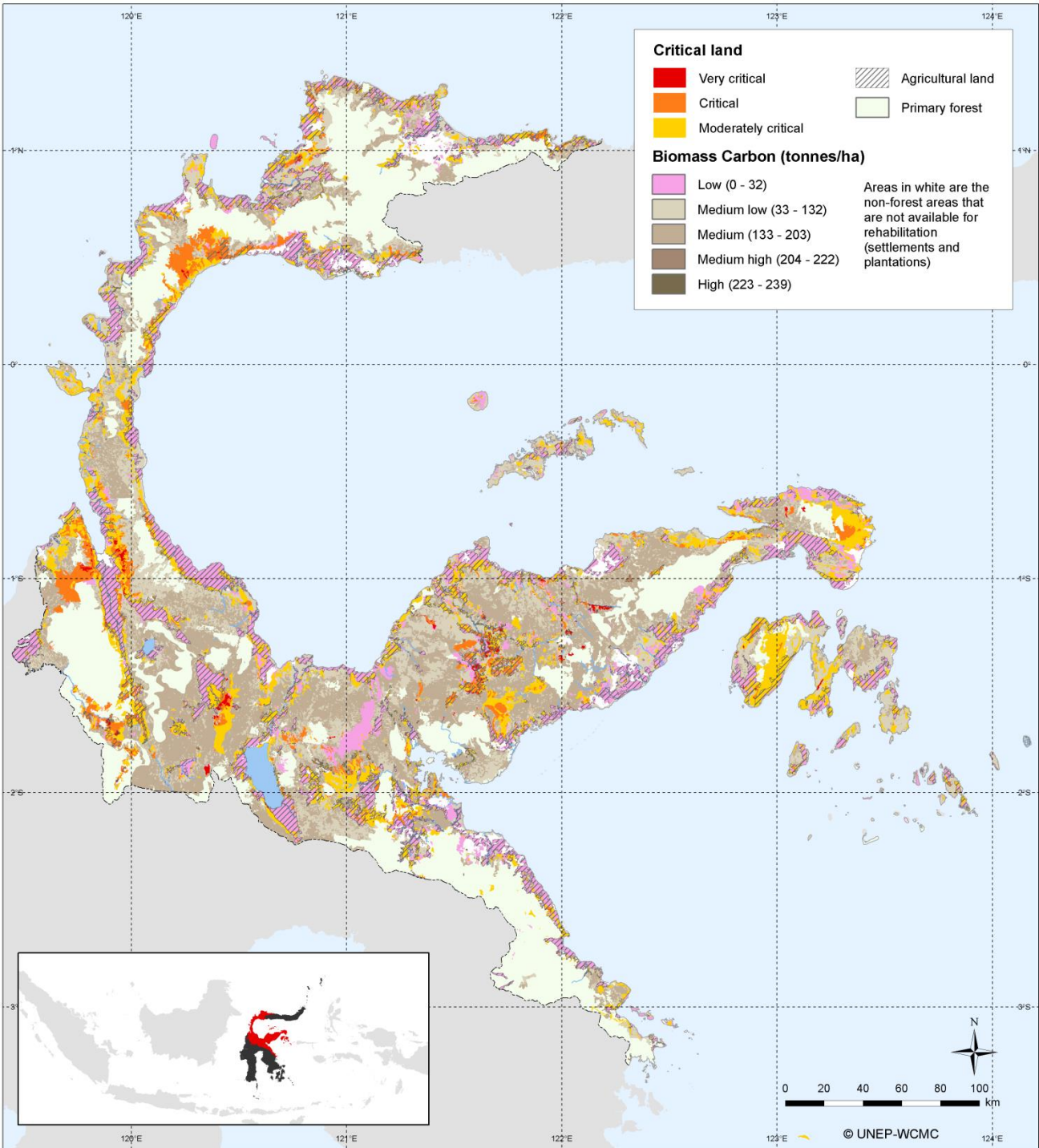
Criteria to consider, cont:

- What about other land uses? E.g. should agricultural areas be excluded? Should planned infrastructure areas be excluded?
- Are there other geophysical aspects to consider? E.g. slope, soil type
- What about social and environmental benefits? E.g. should biodiversity areas and/or poverty areas be prioritised?
- Are there risks from the action that should be considered? E.g. risks to communities? Risks from fires, steep slopes?



What is a workflow?

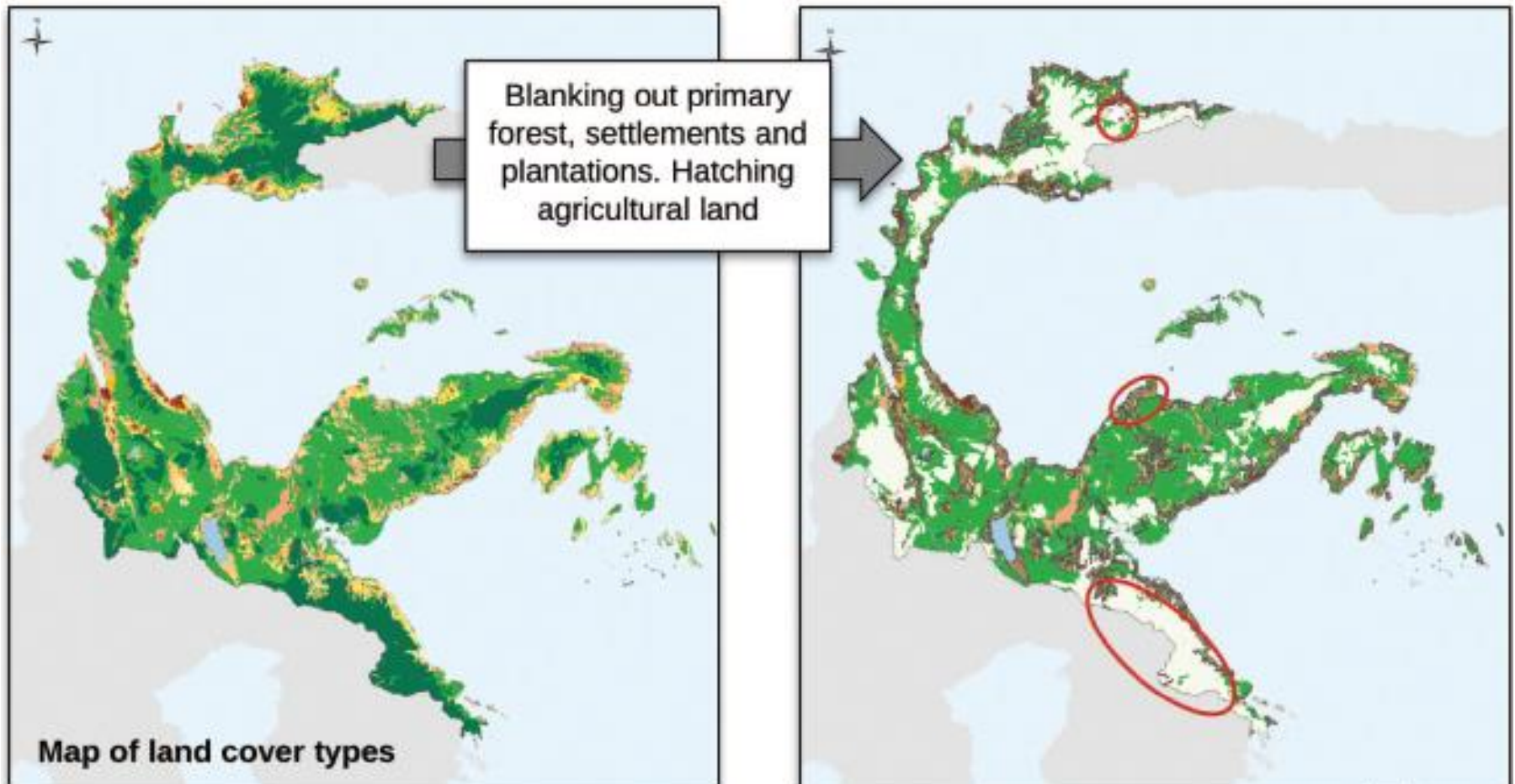
- A workflow defines the **flow of steps** in order to carry out a task or piece of work.
- A **planning workflow** helps to define the criteria and information to be considered in the planning process.
- A **spatial workflow** helps you to decide how to undertake a piece of spatial analysis:
 - the spatial logic you will use to answer a question
 - the input layers / data needed
 - the technical GIS processes / tools
 - and the sequence or order of steps



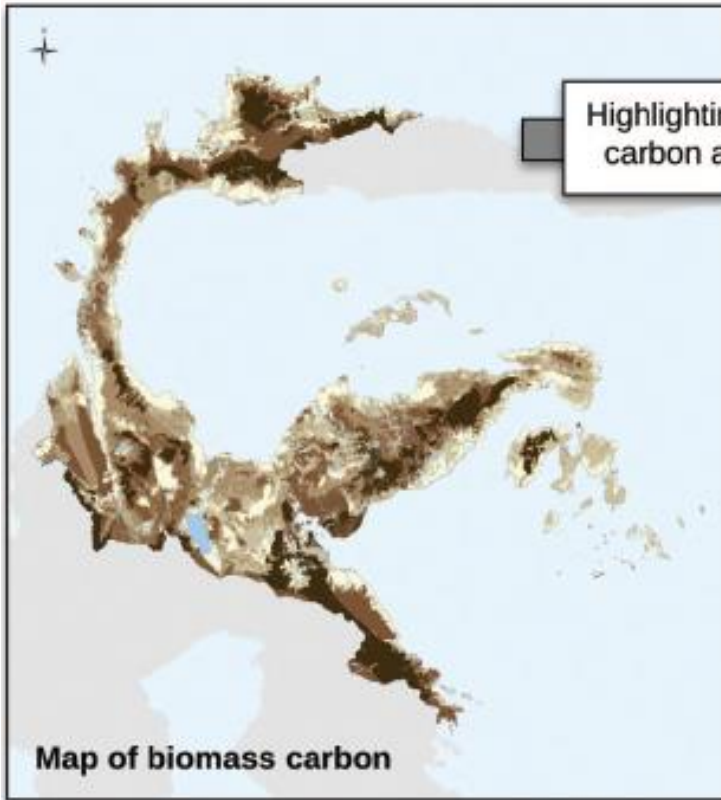
**For example,
a map of
potential
areas for
REDD+
actions to
rehabilitate
forests in
Central
Sulawesi,
Indonesia**

How was this map created? There is a spatial logic or workflow behind it

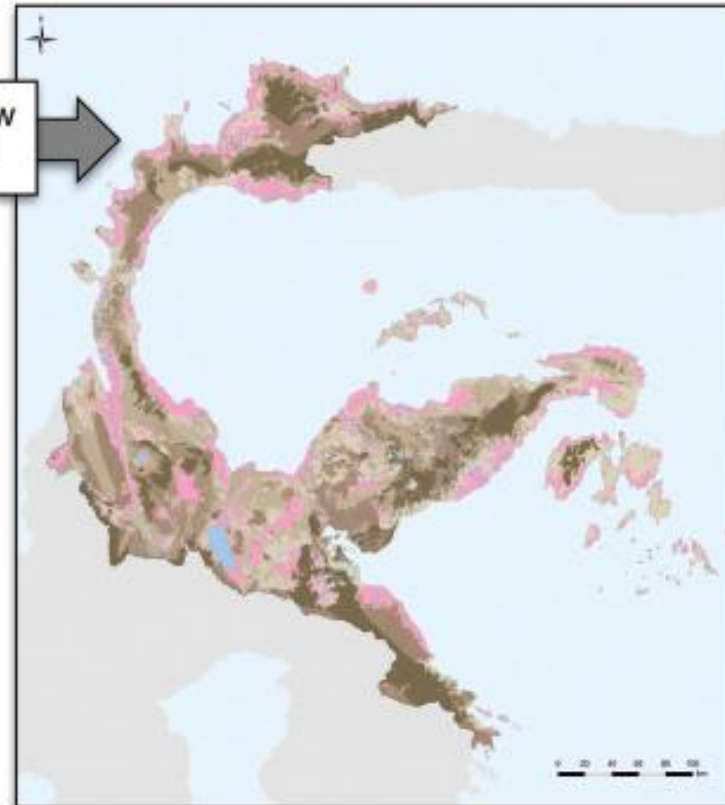
1. Land cover types: where are areas suitable for rehabilitation?



2. Biomass carbon: what are the carbon stocks in those areas?

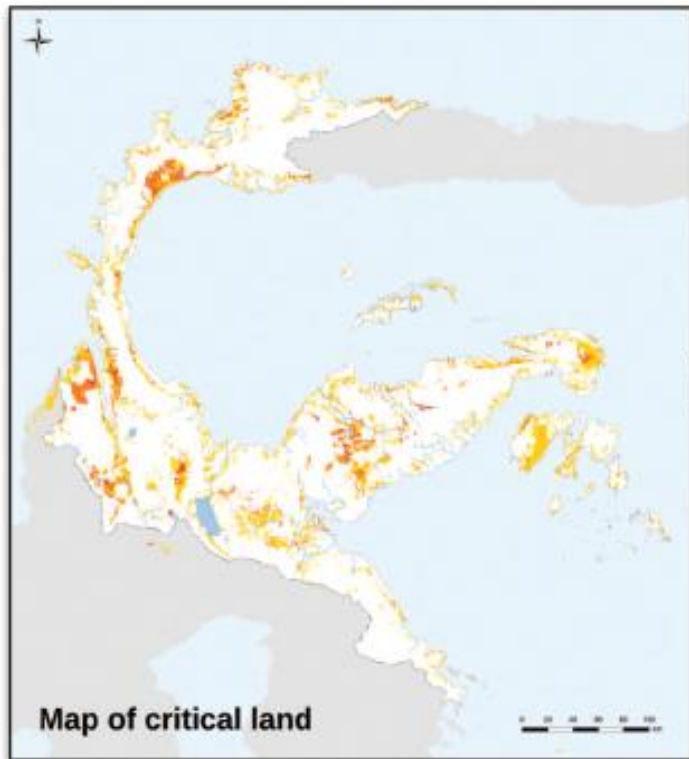


Highlighting low carbon areas

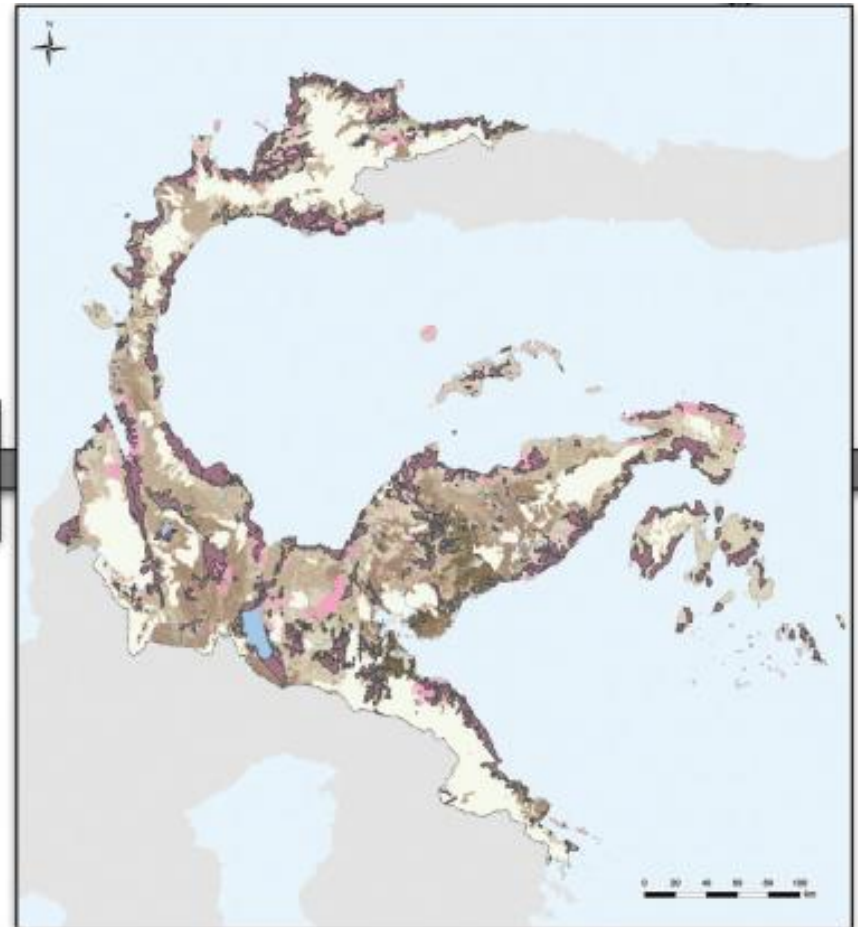


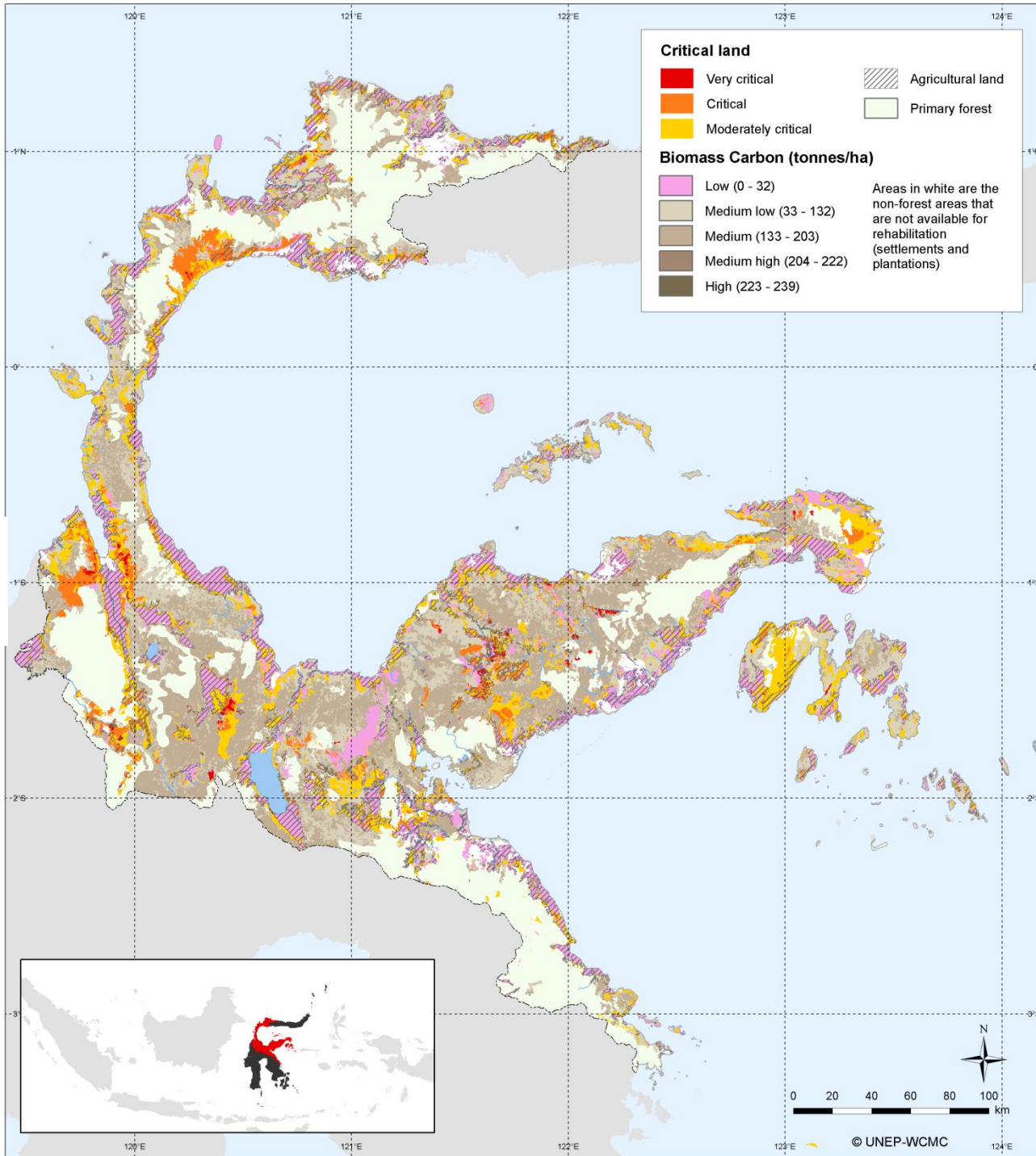
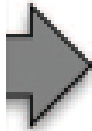
Displaying information on carbon stocks in areas that are not blanked out

3. Overlay: which are the important areas?



Highlighting
critical
land areas





4. Final map: potential areas for REDD+ actions to rehabilitate forests

A workflow should help clarify the following:

- What is the question that we are trying to help answer?
 - *E.g. Which areas in a landscape should be priorities for sustainable forest management certification?*
- What is the output map that we will create to help answer this question?
 - *E.g. Priority Forest Areas for Expansion of SFM Certification Program*
- What input layers / data needed to develop an output map?
 - *E.g. forest status, forest management units, areas already certified, High Conservation Value Forests*

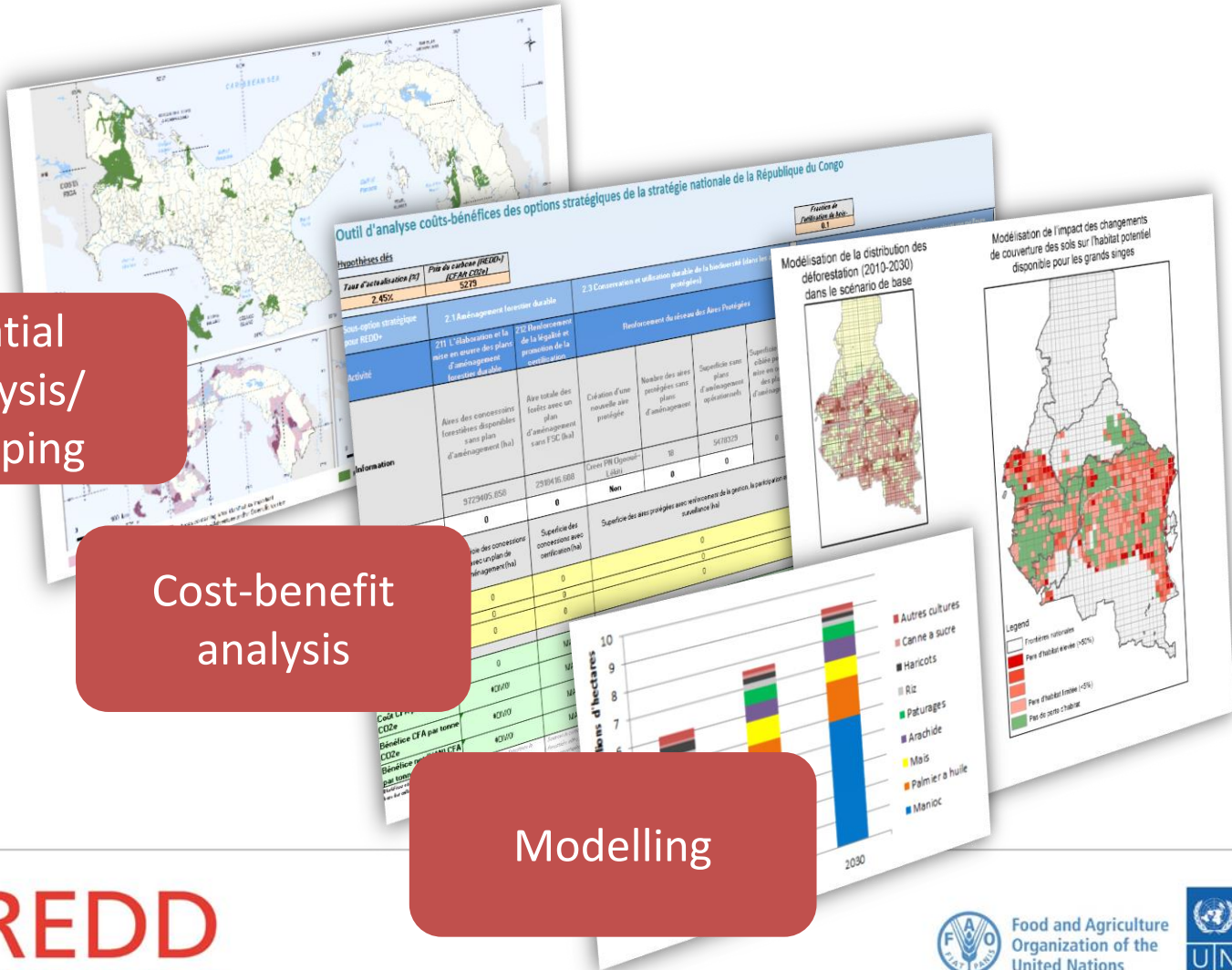
- What other goals are priorities for the action?
 - *E.g. protecting biodiversity as well as carbon, contributing to socio-economic development*
- What assumptions / thresholds do we need to define?
 - *E.g. What kind of SFM certification program is it? Are there eligibility criteria? What counts as high biodiversity?*
- What GIS processes or tools will we use to process and combine the input layers?
 - *E.g. overlay, raster analysis, buffers....*
- How will we validate or check the output map?
 - *E.g. consultation with experts / stakeholders*

4. Tools to support

Spatial analysis/mapping

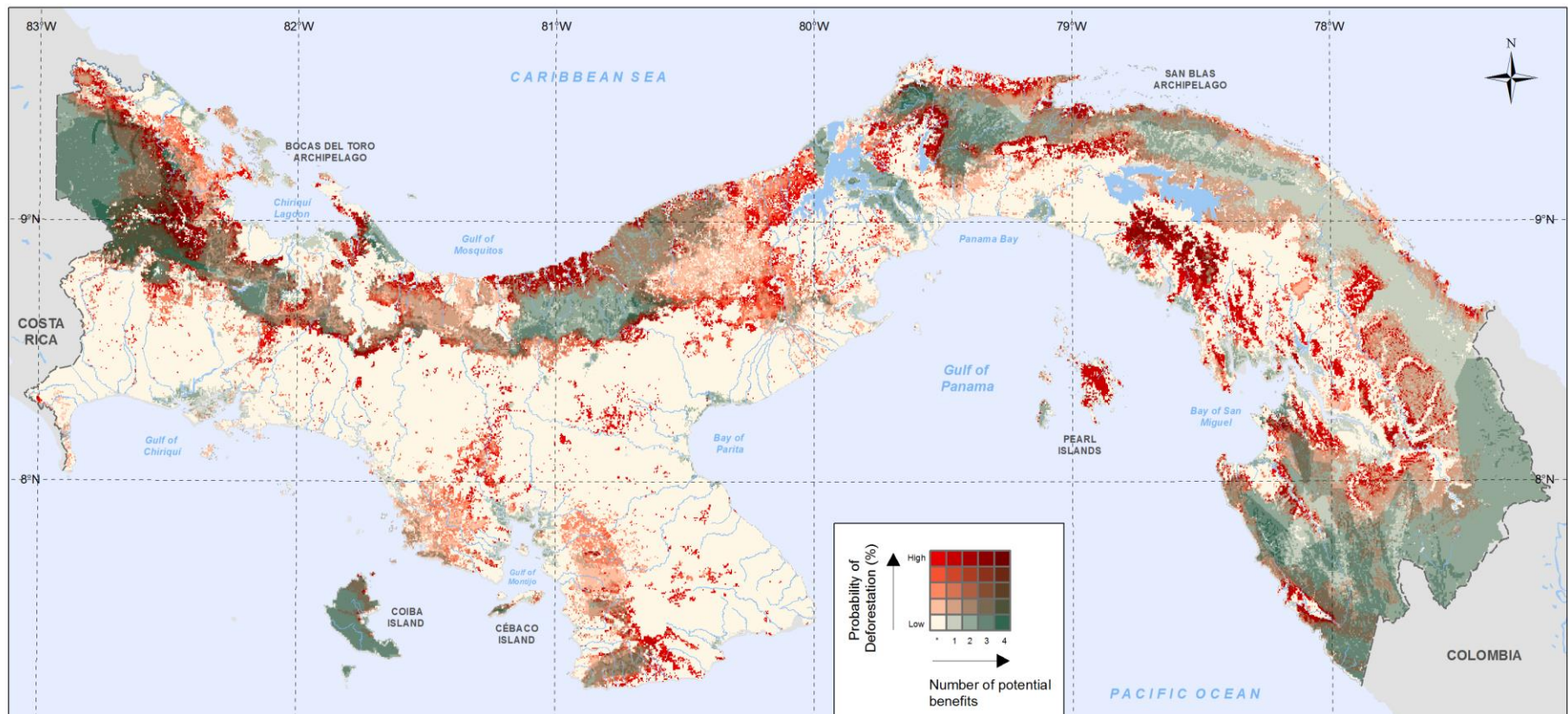
Cost-benefit analysis

Modelling



Spatial analysis / mapping

....the use of geographic information to inform planning, e.g. help to identify priority areas for implementation of REDD+



Map of Panama identifying forested areas of potential importance for multiple benefits, which are also at risk of deforestation

Cost-benefit analysis

...the use of economic information to quantify costs and benefits associated with REDD+, and to compare different options

Costs of REDD+

- Opportunity costs (foregone profits from alternative land-use)
- Implementation costs
- Transaction costs

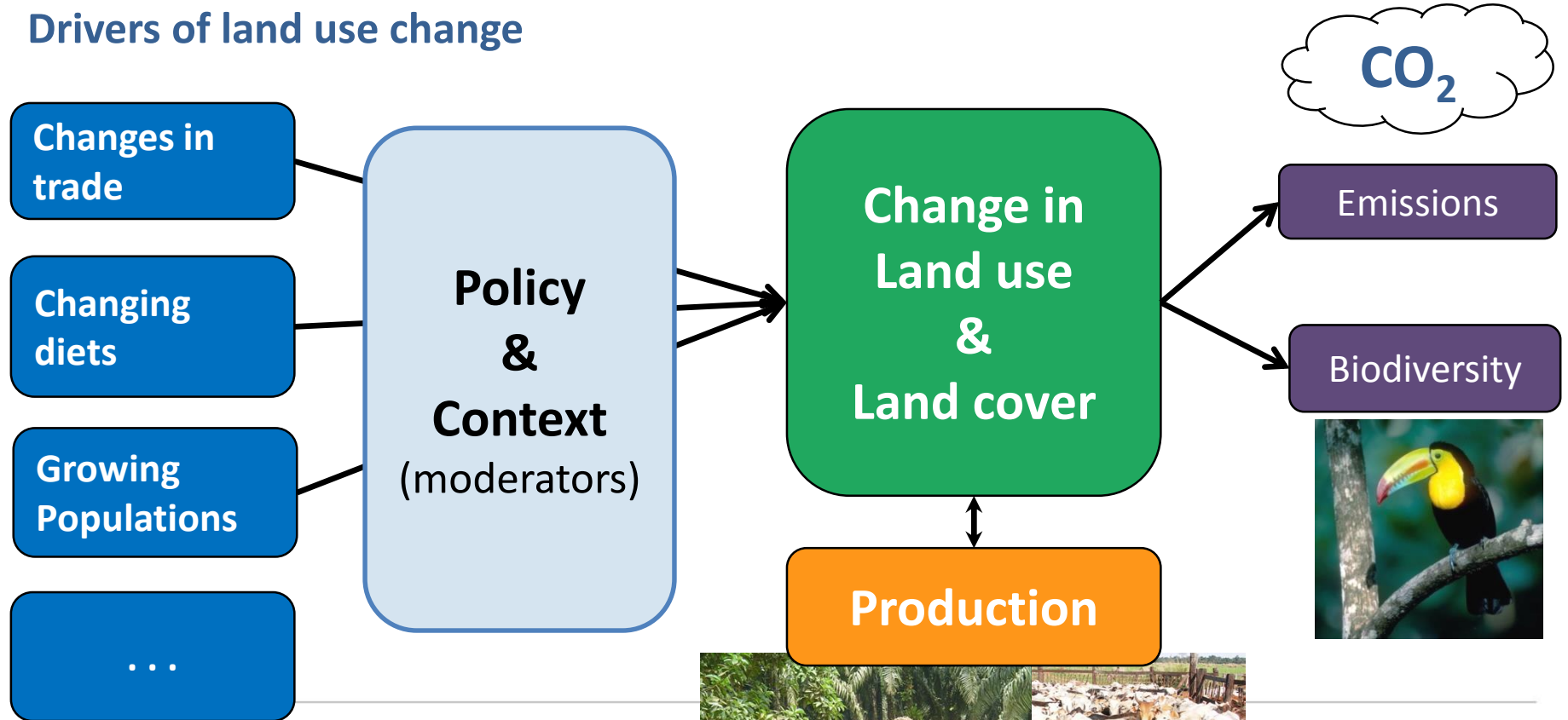
Benefits of REDD+

- REDD+ income
- Forest benefits (e.g. ecotourism, timber, NTFPs)
- Ecosystem services (e.g. water regulation)

Modelling land use change

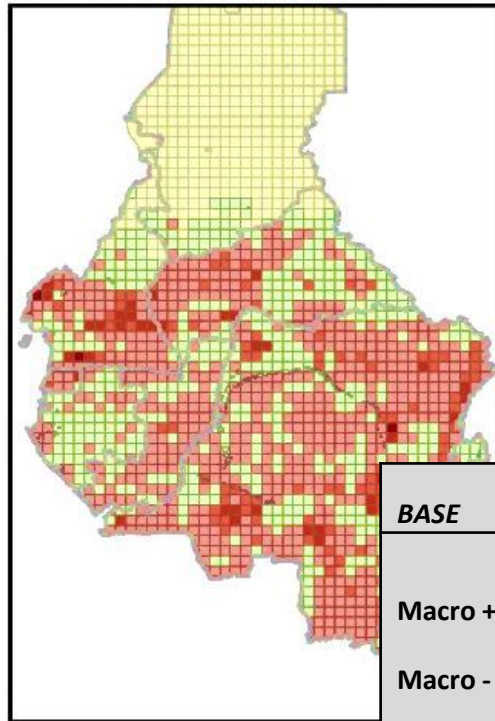
...to simulate future changes in land-use, and implications for forests, carbon, biodiversity and other factors

Drivers of land use change



REDDpac modelling of future land-use change in Congo Basin

Modélisation de la distribution des déforestation (2010-2030) dans le scénario de base



Some Congo Basin results

	Economic development and food security		Climate change mitigation		Biodiversity conservation and sustainable use	
	Calories produced per capita	Net agricultural imports	Total emissions	Emissions from deforestation	Loss of habitat for great apes	Number of species losing >10% of their habitat
BASE	2303	-8009	11893	10095.0	4.8%	371
Macro +	-2.7%	14.9%	12.8%	13.8%	13.1%	9.4%
Macro -	-0.5%	-23.9%	-14.8%	-14.6%	-13.3%	-8.6%
NoPA	0.2%	-0.8%	4.3%	2.9%	10.5%	13.5%
NoFC	0.1%	-0.2%	12.3%	14.0%	11.7%	3.5%
PA +	-3.2%	4.9%	9.4%	8.9%	-3.0%	-71.2%
Yields +	19.6%	-25.8%	-30.6%	-32.1%	-26.1%	-15.1%
Palm +	2.6%	0.3%	1.9%	0.9%	2.1%	1.6%

Summary: role of spatial analysis in REDD+ and integrated land use planning

- How actions can contribute to **multiple goals** in a landscape varies depending on where and how they are implemented.
- Spatial analysis provides **decision support** for REDD+ planning, among other tools/approaches.
- It can help plan for actions that are **feasible**, can enhance **potential benefits** and reduce **potential risks**.
- It is vital to have a robust planning process that **integrates stakeholder knowledge and priorities** with spatial analysis.



Thank you! Any questions?

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