



Spatial planning for multiple benefits from REDD+

¿Qué información se puede desprender de la MRV?

Lucy Goodman



Outline



- Spatial planning for enhancing multiple benefits from REDD+
- Información MRV
- Focus in on Marxan how can Marxan be applied for REDD+, and what are its drawbacks





UNEP

Map prepared by UNEP-WCMC March 2013

Multiple benefits are unevenly distributed in space

Panama Biomass Carbon and Potential Species Richness Based on species classified as threat status 'Critically Endangered', 'Endangered' and 'Vulnerable' by the IUCN Red List of Threatened Species (2010)

Version 2010.4.



Biomass Carbon: National dataset of Aboveground Live Woody Biomass density at spatial resolution of circa 500m derived from field/LDAR(GLAS)MODIS. A. Baccini, S.J. Goetz, W.S. Walker, N. T. Laporte, M. Sun, D. Sulla-Menashe, J. Hackler, P.S.A. Beck, R. Dubayah, M.A. Friedl, S. Samanta and R. A. Houghton. Estimated carbon dioxide emissions from tropical deforestation improved by carbon-density maps. 2012 Nature Climate Change, http://dx.doi.org/10.1038/NCLIMATE1354. The project's web site: http://www.whrc.org/mapping/pantropical/carbon_dataset.html





Different REDD+ interventions may be implemented in different regions



plantation



Where you implement different REDD+ interventions will have variable impacts on multiple







Where you implement different REDD+ interventions will also impact on the **potential risks**









<u>MRV information that could be used for spatial</u> <u>planning</u>

- Natural forest cover
- Degraded forest cover
- Biodiversity indicator species ranges





Información MRV que podría utilizarse en la planificación espacial

- cubierta de bosque natural
- cubierta de bosque degradado
- áreas de distribución de especies indicadores de biodiversidad





What tools are available to help countries address the complex spatial planning challenges that REDD+ creates?

- Spatial overlays
- Marxan
- Marxan with zones
- Zonation
- INVEST

Spatial overlay to highlight -UN-REDD PROGRAMME POTENTIAL areas for REDD+ actions to maintain forest in Central Sulawesi







- Marxan is a type of spatial decisionsupport software used for conservation planning
- It can consider multiple spatial targets set by decision makers



http://www.uq.edu.au/marxan/



- Marxan selects areas which meet the user defined targets, while minimising a constraint of interest (implementation cost, area)
- Output a REDD+ priority map and the "cost" (\$, km²) associated with this priority map



How Marxan works for conservation planning



- Which unit should a decision maker pick?
- Country target is to preserve at least 50% of rana arlequín
- Limited resources







How Marxan works for conservation planning













UN-REDDHow does Marxan work?





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Summed solution

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UN-REDD How does Marxan



work?



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Considerations when running Marxan



However - Marxan and other land-use planning exercises require:

- Multiple quantitative targets that may cover:
 - Carbon
 - Biodiversity
 - Ecosystem services





Considerations when running Marxan

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However - Marxan and other land-use planning exercises require:

- Multiple quantitative targets
- A multi-stakeholder
 group to be consulted

Gráfica 3. Amenazas para las 13 especies amenazadas de distribución restringida en Panamá (varias de estas especies también se encuentran en otros países, por lo tanto, no todas las amenazas necesariamente aplican a este país). Agricultura & Uso de Corredores de Desarrollo Modificación Cambio Contaminación Producción de acuicultura recursos transporte y residencial y dei sistema climático y energia y biológicos comercia mineriz natural climas extremos

Considerations when running Marxan



However - Marxan and other land-use planning exercises require:

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- Multiple quantitative targets
- A multi-stakeholder group to be consulted
- Time and resources





Considerations when running Marxan



However - Marxan and other land-use planning exercises require:

- Multiple quantitative targets
- A multi-stakeholder group to be consulted
- Time and resources
- Good datasets



UN-REDD Take home messages



- Multiple benefits from REDD+ are unevenly distributed in space, spatial planning can support capturing multiple benefits
- Tools are available to support spatial planning for REDD+
- UNEP-WCMC is demonstrating how the Marxan tool can be used for REDD+
- Sometimes the best part of using the tool is getting the right people to engage at the right time in REDD+ planning



UN-REDD Thank you for listening!

Find out more about Marxan:

http://www.uq.edu.au/marxan/

Find out more about UN-REDD:

http://www.un-redd.org/

Find out more about UNEP-WCMC:

http://www.unep-wcmc.org/



Decision support tools for conservation

http://www.uq.edu.au/marxan







How Marxan works for conservation planning



 Here a policy maker may wish to preserve 50% of rana arlequín





Software will not add value here

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How Marxan works for conservation planning



Which area should a decision maker choose to protect





How Marxan works for conservation planning





Course Station





Come Banking





Software will add value here where decision making is complex



- 10-5





How does Marxan choose?

- Produces hundreds of solutions
- Picks the best compromise answer at the lowest cost based on what your objectives are
- Stakeholder involvement is fundamental to setting appropriate objectives



Outline



- The challenge faced by REDD+ countries
- Lessons learned from other disciplines
- Simplifying the challenge Marxan for REDD+
- Key Marxan concepts and limitations
- Next steps







Key Marxan concepts

- Planning Units
- Targets
- Locking in and out
- Cost layer
- Best solution and summed solution
- Simulated annealing





Planning units













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Kang Bakan



Targets (objectives)



Have to be proportions of user defined spatial data layers

- 20% carbon stocks (5Gt)
- 50% great ape ranges







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Example question and related objectives

- Identify all forest that could be retained under RED, meeting the multiple objectives set – based on national target figure for RED:
 - **Objectives:**
 - X% carbon from forest
 - X% classified forests (CODE FORESTIER)
 - X% representative habitat types
 - X% key species ranges





Locking in and out



- Locking in protected areas to REDD priority zones
- Locking out mines from the REDD+ priority zones





Cost layer









Cost layer

• The cost of this solution would be 3









What number should you give a planning unit to represent cost?

- What do you want to minimise in your output?
 - Area
 - Opportunity cost
 - Implementation cost
 - Something else?







How does Marxan reach compromise?









Best solution



100,000 "USD"

A Braker



Summed solution





How does it find solutions? Simulated annealing

- Algorithm simulated annealing
 - Starts by selecting a set number of planning units
 - Adds/removes subsection planning units at random
 - Preserves/discards planning units based on cost and objectives
 - Thousands of times -> solution



Limitations



- Solution is as strong as the data available
- Can't deal with all 5 REDD+ activities at once
- Development objectives can only be considered through locking in and out
- Preparation of input files requires GIS expertise

Next steps



- Make the illustration nationally relevant
- Report on results
- Capacity building on tool
- Support on using tool

