

Opportunities and challenges on the application of REDD+ and similar funds to tropical forest conservation

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The tropical deforestation crisis

Driven by:

- Expanding populations
- Expanding wealth
- Improving accessibility
- Development of new products



The tropical deforestation crisis

- 13 million hectares lost per annum
- About 15% of CO₂ emissions from deforestation
- Biodiversity loss
- Ecosystem services lost
- Cultural damage
- **A sustainable solution is needed!**



Limited global-scale action taken in the last 40 years...

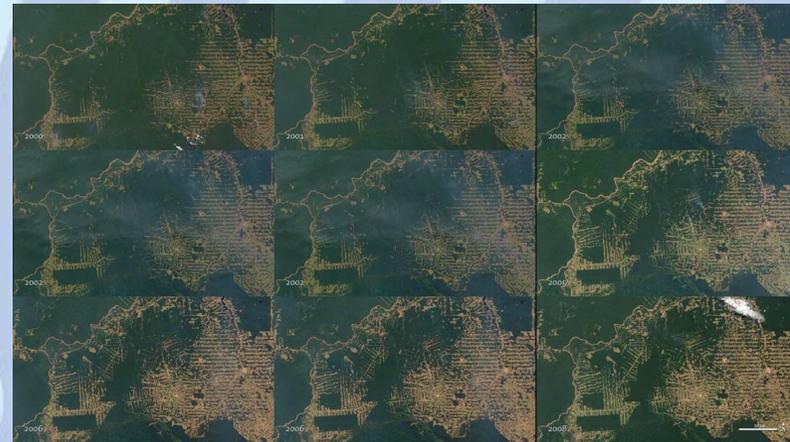
Deforestation crisis acknowledged since the advent of satellite imagery in the 1970s

Consequences have been studied extensively and are widely known.

A global problem with highly diffuse sources; responses have thus largely been localized.

This is largely due to a lack of conservation funding in developing countries where most tropical forests occur.

Many forests not protected, and many that are can be considered 'Paper Parks'



An emerging opportunity from the voluntary carbon trading market?

Funds sufficient to address forest loss on a global scale may be becoming available for the first time!

Through REDD+, tropical forests are being theoretically designated as financial resources in their own right.

Makes forest more valuable if it remains than if its converted to agriculture or other land uses!

REDD+ forests more competitive than gold mining and timber extraction in Guyana

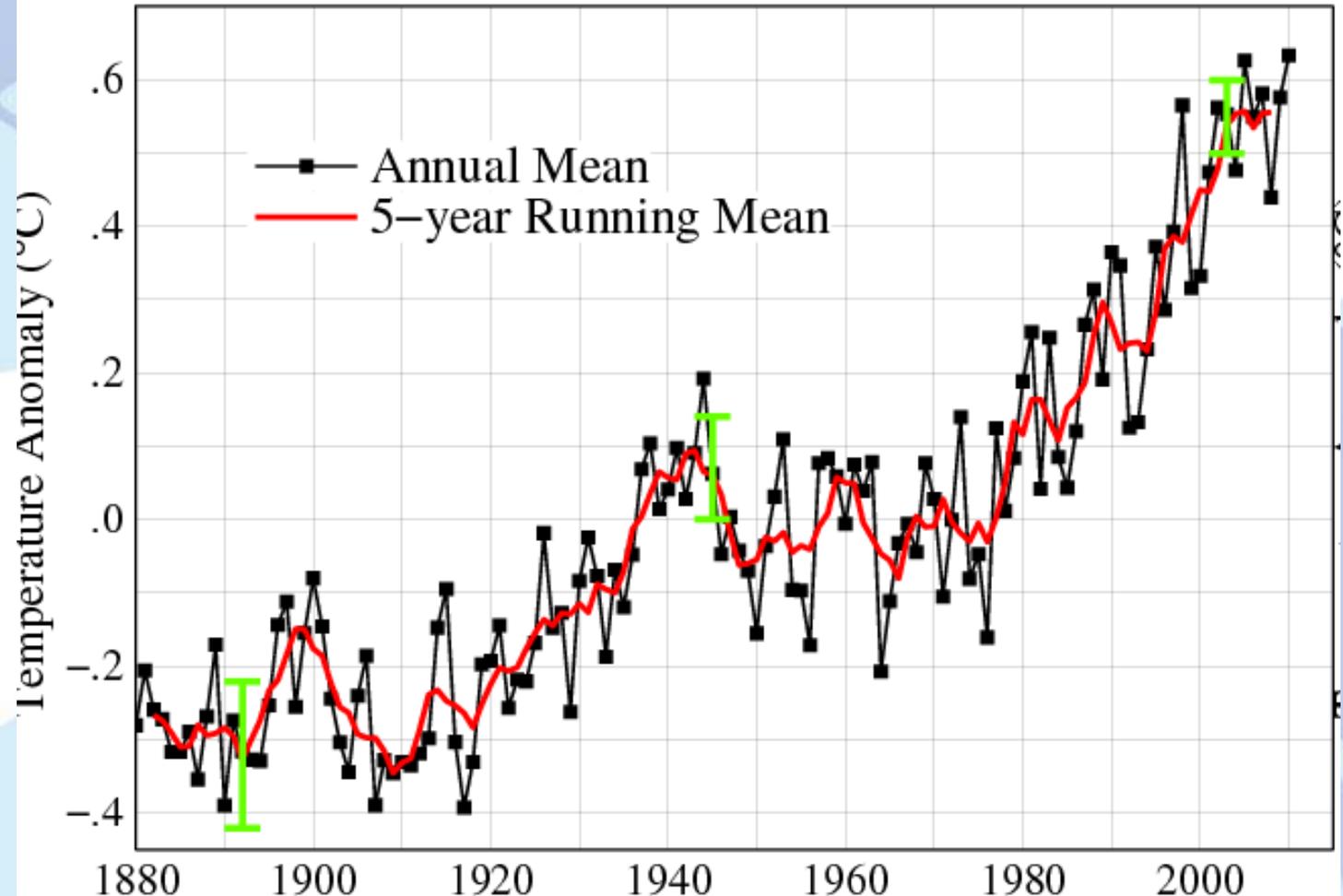


Greenhouse gas emissions



- Greenhouse gas emissions contribute to global warming
- Current emissions would cause a temperature rise of 1.1 - 6.4°C by 2100
- Many adverse effects

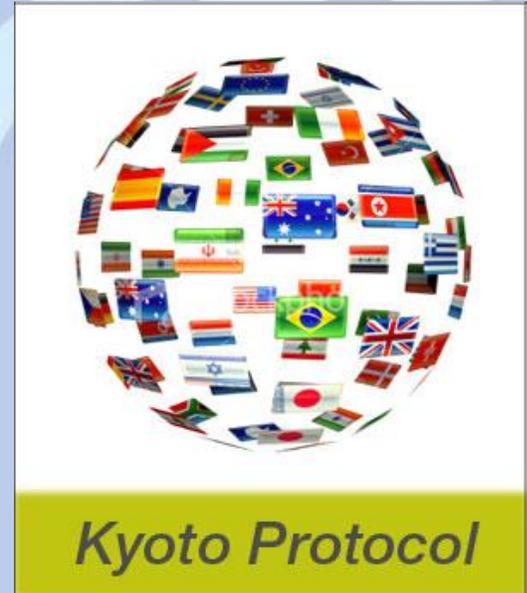
Global Land–Ocean Temperature Index



Global efforts to address climate change risks



- 1997 the UNFCCC developed the Kyoto Protocol
- Followed in 2016 by the Paris agreement
- Goal of keeping temperature rise $<2^{\circ}\text{C}$
- Made reduction of GHG emissions a binding requirement
- Reductions can be by cap or by offset.



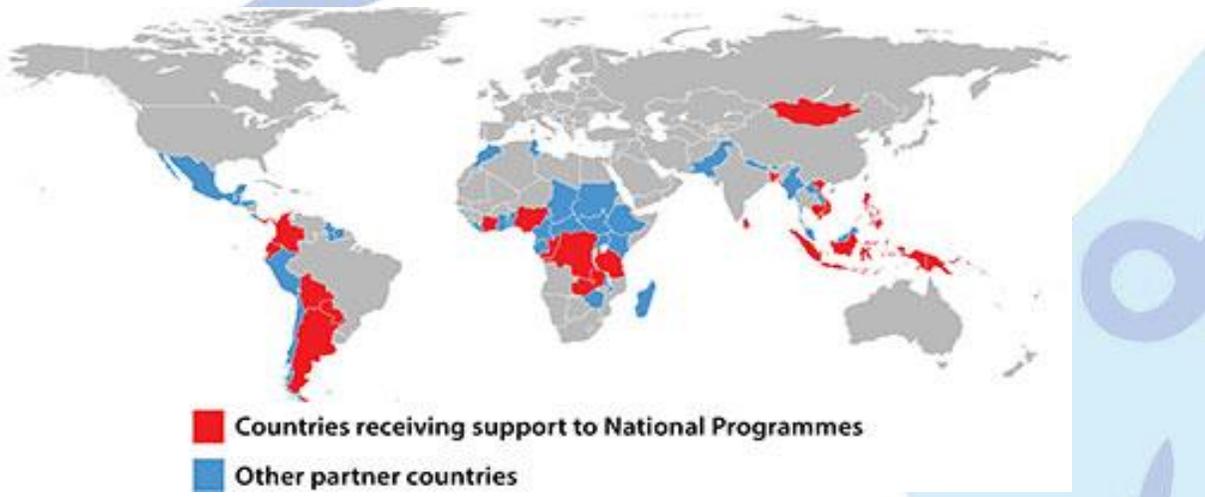
REDD+



REDD+ (Reducing Emissions from Deforestation and forest Degradation) - the most prominent of several bodies aiming to regulate carbon offset trading.

Aims to identify forests that have not only high carbon content, but also high biodiversity, ecosystem services, and social value. Forests must also be proven to be at risk.

Accredit carbon stocks in projects within REDD+ countries, which can then be sold on the global voluntary carbon market as carbon offsets. Funds also come as bilateral aid



REDD+



- Significant funds for stopping tropical deforestation suddenly available from businesses and governments all over the world!
- \$1 billion REDD+ pledge to Indonesia from Norwegian government
- Multiple other national donations (\$1.5 billion from US, \$200 million from UK etc).
- \$379 million from carbon investment projects by end of 2014 (ultimately much more projected)
- Projects must retain carbon stocks over long project periods for all project funds to be released, so theoretically sustainable.



Other carbon-based funding platforms also exist

These are allied to REDD+ guidelines to greater or lesser extents

Can be funded by bilateral aid, private enterprise, or both



Challenges



Theoretically a great way of keeping forests standing.

However, key challenges remain to ensure the overall sustainability of these schemes:

- 1) Accessibility - Setting up REDD+ projects in a tropical data vacuum**
- 2) Ensuring frameworks are in place to see carbon credits and disseminate funds**
- 3) Stability of the carbon offset market**
- 4) Providing adequate protection for different forests**
- 5) Underlying ethics**



Setting up REDD+ projects in a tropical data vacuum



REDD+ projects have to be very carefully audited to protect investors.

Data is also required for regular project monitoring.

Insufficient data = no project!!!

Can be difficult to achieve data requirements as requires funding, labour, and expertise that is impossible to source in most tropical ecosystems.

Therefore accessibility of REDD+ projects is currently low



Case study – Operation Wallacea’s REDD+ project on Buton Island, SE Sulawesi



Operation Wallacea has been operating since 1998 and now coordinates research programmes in 14 global locations



OpWall's global research reach



The OpWall model

- Fee-paying students come to field sites to conduct their own research or gain practical experience
- Fees support academic research at these sites
- Large student groups provide significant manpower to produce big ecological datasets in poorly-studied tropical regions
- No. of volunteers steadily growing – 4,800 individuals across all sites in 2014 (934 in Indonesia)

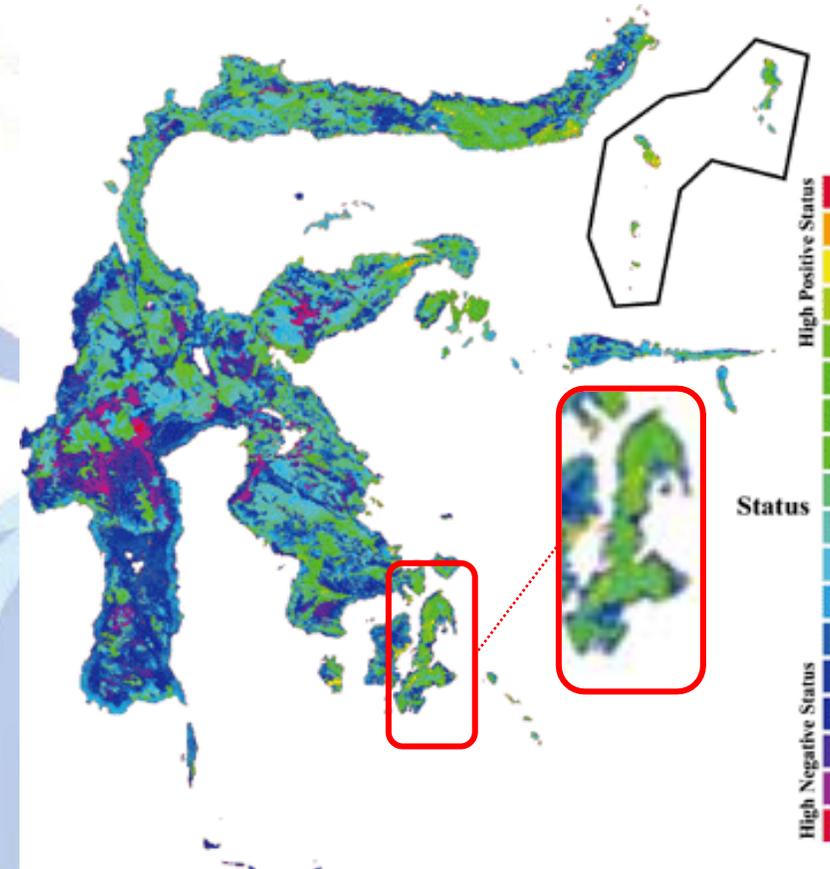
Buton Island and the REDD+ application: Describing the biodiversity of Buton



Biodiversity overview

- Buton holds 62% of the terrestrial bird species, 54% of the snake species and 33% of the butterfly species known from Sulawesi
- Several important regional flagship species occur on the island including the Knobbed Hornbill, Booted Macaque and Lowland Anoa
- 26 species found on the island are considered threatened or near-threatened with extinction (IUCN 2014)
- Buton is still largely forested with ~80% of its forest possessing higher than average quality for the region
- Despite this, Buton's forest is being lost at ~1% per annum

Taxon	N° species	N° Wallacean endemics	% endemism
Mammals (all)	40	12	30%
Mammals (non-volant)	13	10	77%
Bats	27	2	7.5%
Birds	87	42	48.30%
Herpetofauna	49	17	34.70%
Freshwater fish	29	1	3.45%
Butterflies	101	54	53.5%



The forest status of Sulawesi, with Buton shown in the call-out box (Cannon et al, 2007)

- Buton island Area: 4,400km²
- Forest: ~ 3,500km²

Buton Island and the REDD+ application: Calculating carbon stocks

Forest category	Average metric tonnes of carbon per hectare	Financial value of carbon stocks per hectare (US \$)	Total hectares of stratification type	Total financial valuation of stratification type (US \$)
Unprotected forest and production forest	221.54	1,552	159,884	248,201,264
Strict reserve	323.27	2,265	149,231	338,043,896
Limited production forest	461.59	3,234	40,461	130,870,319
Total value of carbon stocks in project area				717,124,474

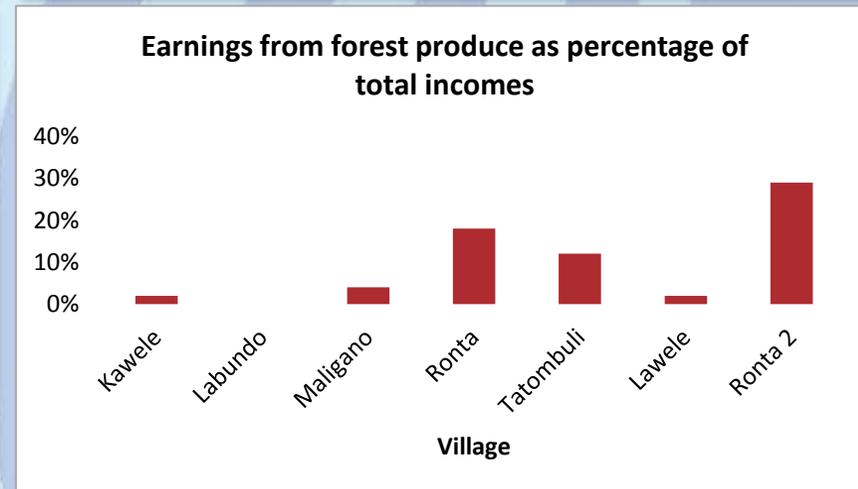
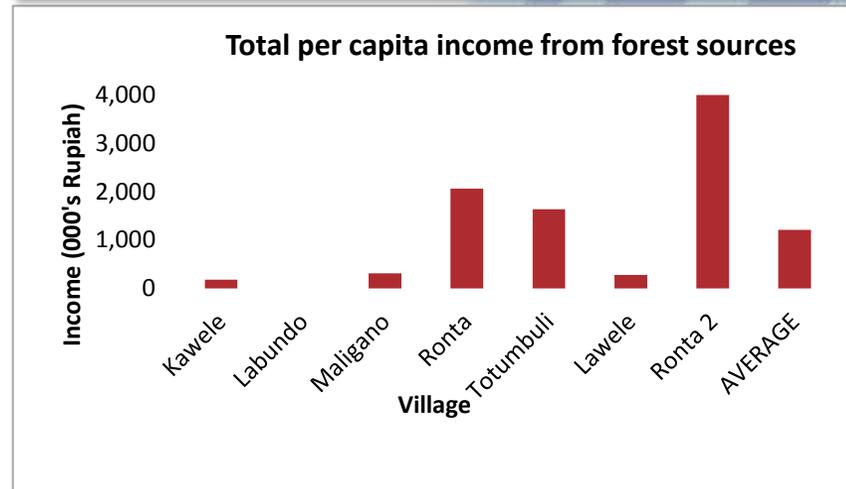
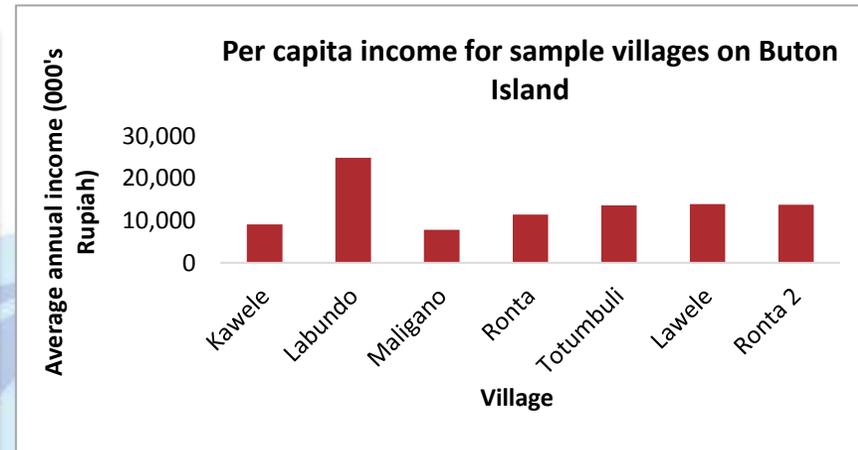


An overview of the carbon stocks on Buton
Figures calculated by methodologies provided by Brown et al. (1997)

Socio-economic data obtained by a developmental organisation (CARE International) and funded through our partner Trust



- Dependence upon forest resources is variable but much higher in villages in the North of Buton
- Sustainable alternative incomes required to replace forest-dependent incomes across the whole study area are ~\$297k per annum



CARE also consulted communities to draw up sustainable livelihood projects in the study area



Project Type	Project Descriptions
Agricultural	1. Using agricultural expertise from elsewhere in Indonesia and potentially mobile technologies to demonstrate to and inform smallholders regarding how to grow new crops or to improve yields of currently grown crops
	2. Providing seeds for new crop types (including high-yield varieties) to accompany the expertise described above
	3. Creating shaded plantations of Rattan within existing Teak plantations to provide an additional revenue from a secondary crop
	4. Establishing links with Fairtrade organisations to open up new routes to market for Butonese products such as Papaya chips, cacao, rice, cashews, honey, etc
	5. Investing in processing facilities (e.g. cashew drying factory / copra processing plants, etc) to increase the value of locally grown crops
	6. Bringing expertise and materials to improve irrigation and increase yields of rice (and potentially other) crops
	7. Providing solar or battery-powered electric fencing (including 'roofing') for smallholders to reduce loss of crops to pests (including pigs and monkeys)
	8. Providing means to develop new incomes from livestock (e.g. via introduction of cattle to villages which are currently strictly arable by possibly using a 'cow-loan' scheme where pregnant cattle are loaned to villages until they give birth, after which the cow is returned to its place of origin and the calf stays in the village)
Enforcement	9. Hiring community rangers to improve conservation enforcement within protected areas
	10. Investing in better facilities and equipment for rangers (transport, computers for administration, etc)
	11. Provision of specialist training for rangers and wider BKSDA staff
Other	12. Investing in carrageenan processing facilities in coastal communities to improve revenue from seaweed sources
	13. Investing in fishing equipment and bringing fishing expertise to improve yields from fish stocks in coastal communities
	14. Strengthening rural distribution networks using mobile technologies such as the Cherie Blair Foundation and Vodafone's RSV system
	15. Making micro finance loans and other financial services such as insurance and healthcare financing, etc available (via services such as CARE's micro loans / mobile systems such as Vodafone's MPesa service)

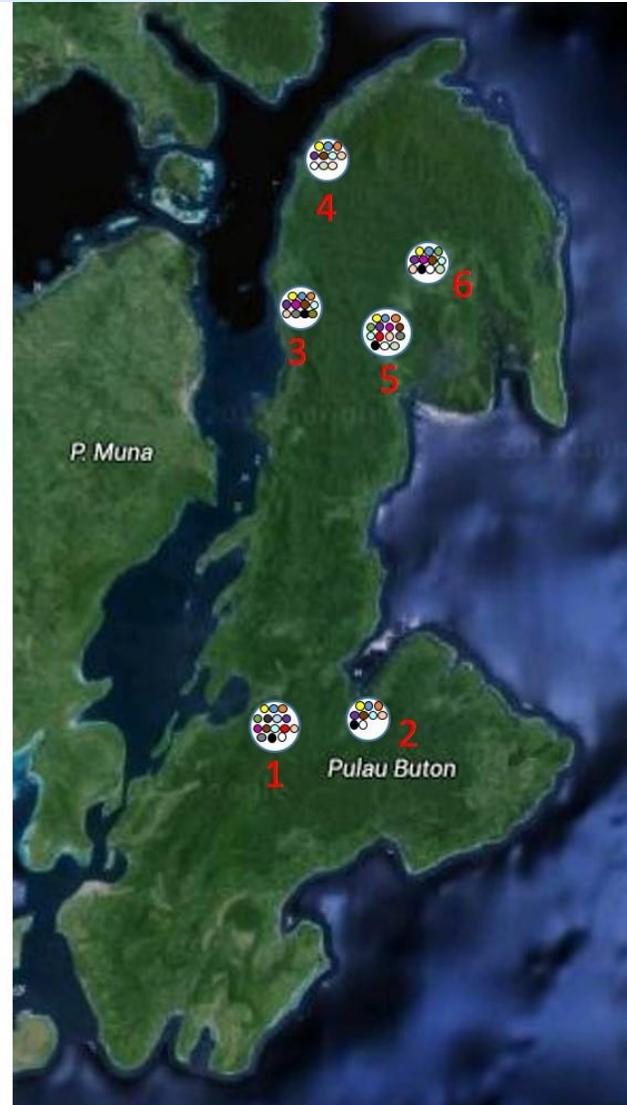


Buton project map



Village codes:

- 1) Kaweli
- 2) Lawele
- 3) Maligano
- 4) Tatombuli
- 5) Rante-gola
- 6) Ronta



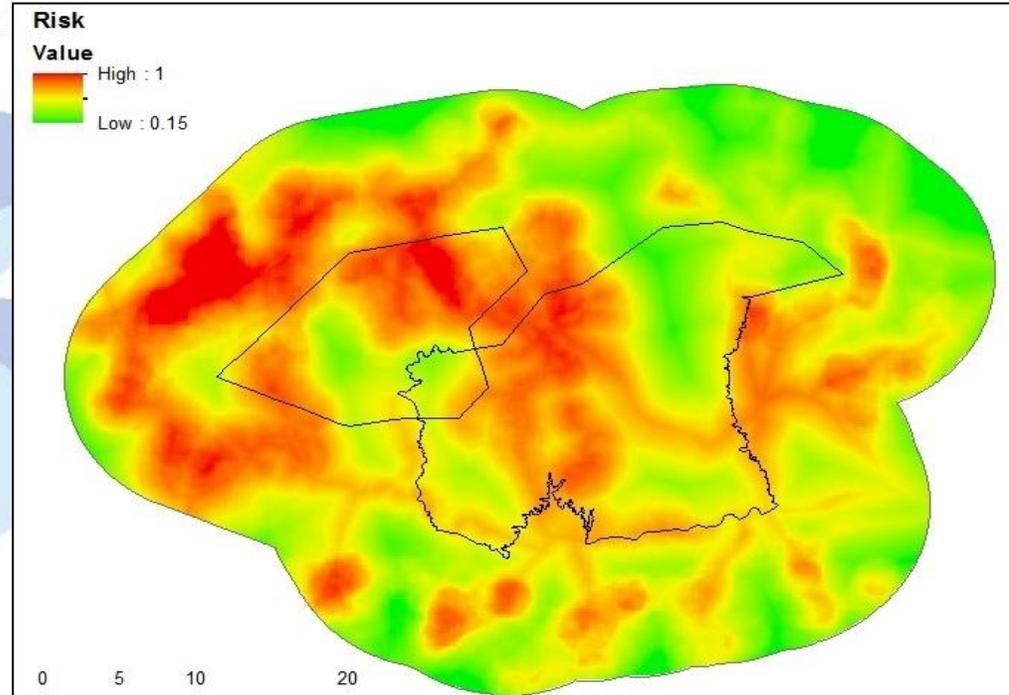
Project codes:

- Improve farming practices by providing trainings to farmers
- Improve community awareness on the forest/Funding for environmental education for children and youth
- Improve access to water and sanitation facilities
- Irrigation systems for paddy fields
- Irrigation through new wells and water hose systems
- Assistance for home industry start-up of farm products
- Supply of pest control equipment such as electric fencing and nets
- Venture capital for business start-up
- Assistance from government and agriculture extension staff to improve farmers' knowledge and skills
- Introduction and/or extension of economic value type commodities (crops and livestock)
- Facilitate establishment of women cooperative
- Training and awareness programs on flood and drought mitigation
- Income generating activities for women
- Provide training for youth on specific skills relating to how to start up a business
- Supply of farm product processing facilities for copra, cashew and cacao
- Seaweed cultivation
- Supply of fishing equipment

Similar projects in other sites...



NFS project in Cusuco National Park



Risk Category	Risk Index	Area (Ha)	Carbon Stock	Carbon density	Carbon st. dev	Vc	Credit potential (tCO ₂ /yr)
Very Low	0	0	0	101	46	76.82	0
Low	0.2	621	62721	101	46	76.82	1,749
Medium	0.4	20202	2040402	101	46	76.82	113,804
High	0.6	32177	3249877	101	46	76.82	271,893
Very High	0.8	2600	262600	101	46	76.82	29,293
Total		55,600	5615600				416,739



Data accessibility and REDD+



We obtained the required data, but only with the help of dozens of taxonomic specialists, hundreds of volunteers, academic back-up for technical aspects like remote-sensing analysis, and a partnership with a Trust who raised funds for a socio-economic evaluation

This still took us a decade to put together & much forest was lost in this time period.

Hundreds of hours of report writing and data analysis support from volunteers

Most local organisations interested in protecting local forest ecosystems cannot replicate this model.



Data accessibility and REDD+



- REDD+ projects may be being directly simply to areas which have data, not places where carbon stocks are most extensive or most threatened
- If private trading platforms grow as expected, supply of projects might not be able to meet demand
- Some private companies take 'shortcuts', but these end up under-valuing their projects



Ensuring frameworks are in place to see carbon credits and disseminate funds



Even with all our data, we have not overcome this issue on Buton Island...

Major bureaucratic issues holding up delivery of funds in Indonesia.

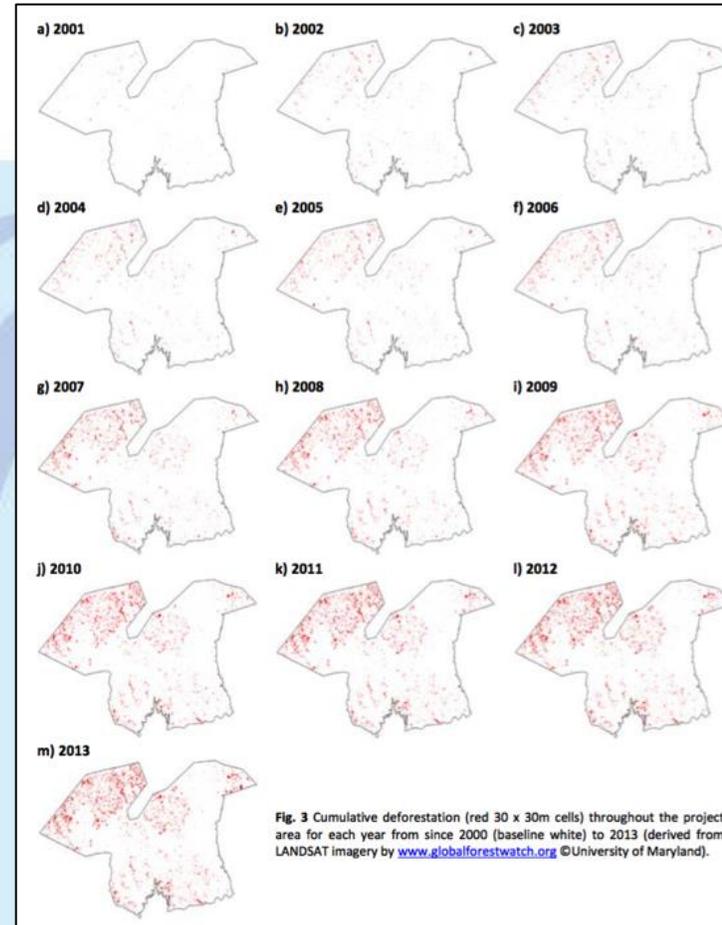
This is symptomatic of REDD+ programs elsewhere (i.e Honduras).

Little to no help with project set-up periods in REDD+

Priorities often given by frameworks to existing projects rather than new projects

Most REDD+ projects to date funded by bi-lateral aid, rather than carbon investors, which is supposed to be the mechanism of making this system sustainable!

So in many ways the REDD+ system isn't ready yet, even though tropical forests need help immediately.



Maybe some breaking news on this though...



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Mongabay Series: [Indonesian Forests, Jokowi Commitments](#)

Indonesia to get first payment from Norway under \$1b REDD+ scheme

by Hans Nicholas Jong on 20 February 2019





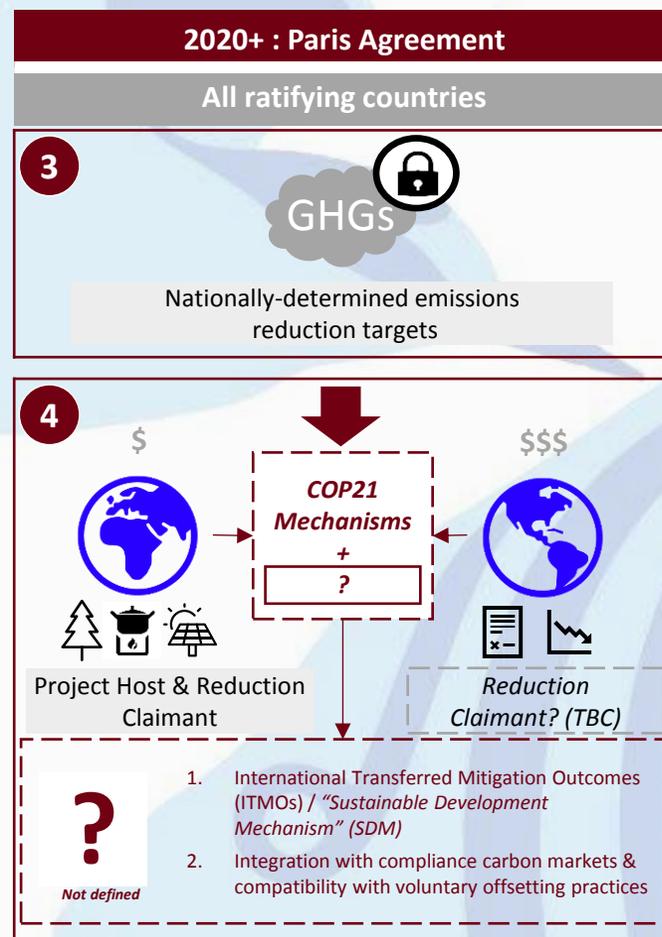
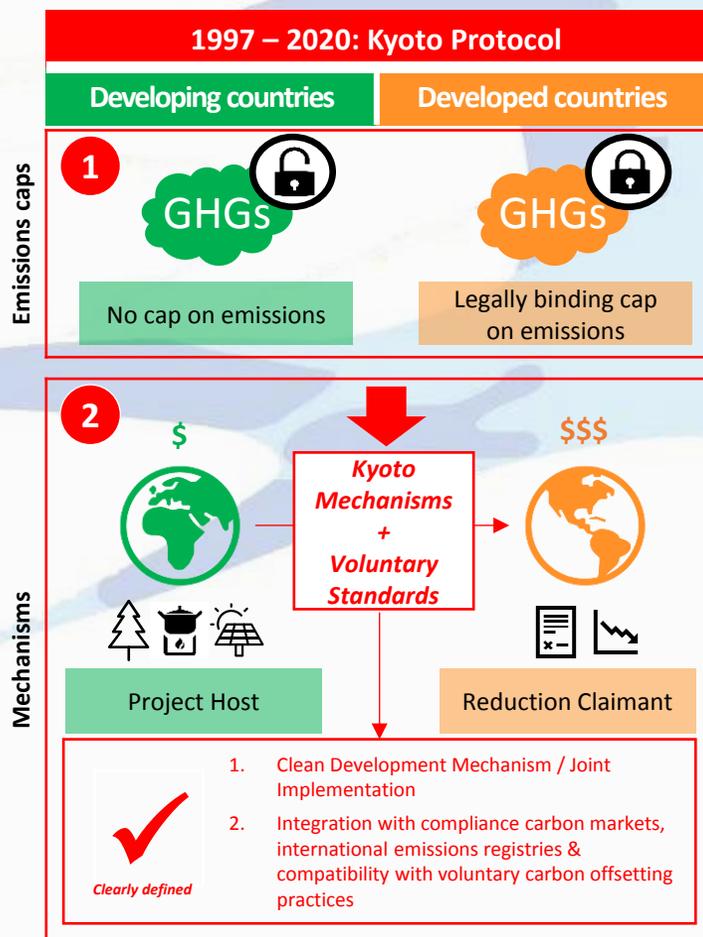
Uncertainty in the Carbon Market

Summary: Carbon offset market outlook

- ❑ **FUTURE UNCERTAINTY:** The future of the global carbon offsets market is uncertain
 - The offsets market today relies on the rules and policies created under the Kyoto protocol
 - From 2020, a new international climate policy regime will be active, which may or may not accommodate current approaches and methodologies to offsetting
 - Whilst this uncertainty has unnerved the carbon offset markets in the short term, it is possible that an invigorated, sustained, and potentially entirely new set of offset demand drivers emerge post-2020
- ❑ **POST 2020 REGIME:** The new international system – first outlined under Article 6 of the 2015 Paris Agreement – strengthens the overall approach to combatting climate change, but creates challenges for offsetting:
 - Post 2020 all signatory countries will have emissions targets (set via their own nationally defined contribution plans)
 - Since all emissions will now be subject to national control, the ability to create project related reductions (offsets) is more complex than in the past. International trading of offsets will likely be possible, but will require corresponding changes in national emissions targets to avoid double-counting of carbon reductions. The question of ownership rights to any emissions reduction is particularly critical for the voluntary offsets market
- ❑ **LOCAL-FOR-LOCAL:** There is likely to be increased focus on locally-sourced offset markets in certain countries to support local carbon pricing rules and regulations
- ❑ **AMBITION FOR POST-2020 MARKET MECHANISMS:** The post-2020 climate agreements are in principle supportive of market-based mechanisms (under Article 6), and solutions may be found to support the continuation of the carbon offset market. Industry bodies (e.g. IETA, ICROA) are pushing for resolution to these challenges through 2018/19.
- ❑ **MARKET PERSPECTIVE:** Players in the voluntary market view regulatory policy uncertainty as the most significant challenge facing their sector
- ❑ **VOLUNTARY DEMAND:** For now, offset demand appears healthy amongst voluntary purchasers, however many companies are increasingly focusing on alternative routes to emissions reduction (e.g. use of renewables)

Global policies that underpin carbon offset markets will change substantially from 2020, with uncertainty on how it will work alongside national carbon targets

Past and future regulatory foundations for carbon offsetting



1 Under **Kyoto**, only a select **few developed countries** were **subject to caps on their emissions** and it was this divide between **capped and uncapped-nations** that helped pave the way for the formation of international carbon markets as they exist today

2 The Kyoto Mechanisms, paired with **an international emissions registry**, enabled **international transfers of emissions credits** from Project Hosts to Project Claimants without double-claiming issues arising

3 The 2015 **Paris Agreement** involves (almost) **all countries** setting their own **nationally-determined targets** to reduce GHG emissions. This **complicates the international transfers of emission reduction credits** and will require new rules, which are being developed

4 Article 6 of the Paris Agreement laid out plans for **two new mechanisms** for international, market-based cooperation on emissions reduction. These have not yet been defined and it is still unclear how thorny issues concerning **double claiming will be avoided**

Ensuring all forests can benefit from REDD+ style projects



There are many kinds of tropical forests in the world

REDD+ does take into account biodiversity and ecosystem services of a project area, but ultimately carbon stocks underscore whether a project is viable or not

However, not all forests have high carbon, and many low-carbon forests have high biodiversity and/or endemism

Endemism and carbon stocks in tropical forests often negatively correlated –
le: Mariarano Forest, Madagascar.

So creating a model that is capable of protecting all kinds of tropical forests is a challenge yet to be resolved!



The underlying ethics of these platforms

- Offsets may not reduce overall carbon emissions!!
- Pay here, pollute there, but pollute nevertheless?
- Are offsets like this really in the spirit of agreements like Paris, and are they helpful in forcing the cultural changes needed to address climate change?





Conclusions

- REDD+ and similar models represent a huge opportunity for reducing global deforestation rates.
- However, major issues remain to be resolved regarding funding accessibility, data requirements, and global 'reach' before they have a chance of being truly sustainable. **These are matter that need to be solved with a sense of urgency**
- **Timely implementation!**
- Underlying concerns also remain regarding whether carbon offsets can ever be considered truly sustainable with respect to climate change projections



Any Questions?