UNFCCC Workshop
Reducing Emissions from Deforestation and Forest Degradation

Experiences of Papua New Guinea

Tokyo, Japan
24 June 2008

Office of Climate Change & Environmental Sustainability

OCC Overview

Leadership

Led by Prime Minister

Housed in PM's Department with technical support from DEC

Clear Objectives

Decouple Economic Growth from Carbon Emissions

50% Reductions by 2020 and Carbon Neutral by 2050

Integrated Approach

Coordination of Ministries, Departments, Donors, Agencies, NGOs, Private Sector

OCC Structure

OCC Initial Focus

Forestry	• Eco-system Services – REDD, watersheds, etc. • Commercial Logging (Extraction, plantations, SFM) • Conservation, Wildlife Areas, Regeneration
Agriculture	• Commercial – oil palm, sugar, coffee, cocoa, etc. • Rural / Shifting – traditional methods • Increased productivity / Fertilizers
Transportation	• Renewable Fuels -- Ethanol • Cleaner Burning – natural gas, electric, • Public Transportation Systems
Energy	• Renewable – hydro, geothermal, wind, solar • Fossil Fuel Resources – oil, gas, coal • Small Scale / Rural Energy Systems

REDD: Moving Forward

Phase 1

Readiness

Capacity

Analyze
Past, present, future

Evaluate
Drivers, Opp. Costs., Data and Methods.

Institutions
Policies & Instruments

Demonstration
Test Policies & Instruments vs. drivers

US$ 500 mil. - $2 B

Phase 2

Early Action

Scale Up Funding

National / Reg. Markets
IPCC Methods
Early Action: Credits transferable to future.

Linking Sectors
Airlines / Shipping
Tax: $15/ton = $6-$12 B/Y

Tax
Oil: $0.39/b ($10 B/Y)
AAU: $0.90/u ($10 B/Y)
Energy Subs: ($250 B/Y)

US$ 2 – US$ 5 B/Y

Phase 3

Post 2012

Future Regimes

Voluntary & Fair
Positive Incentives
Cut Process Hurdles

Proportional
20% of Resources

Fungible
Equal Value for Credits

Balanced
Supply = Demand

US$ 10–US$ 25 B/Y

2008 — 2010 — 2012+

REDD: Strategic Alliances

SUCCESS

UNFCCC

REDD: Joint Readiness

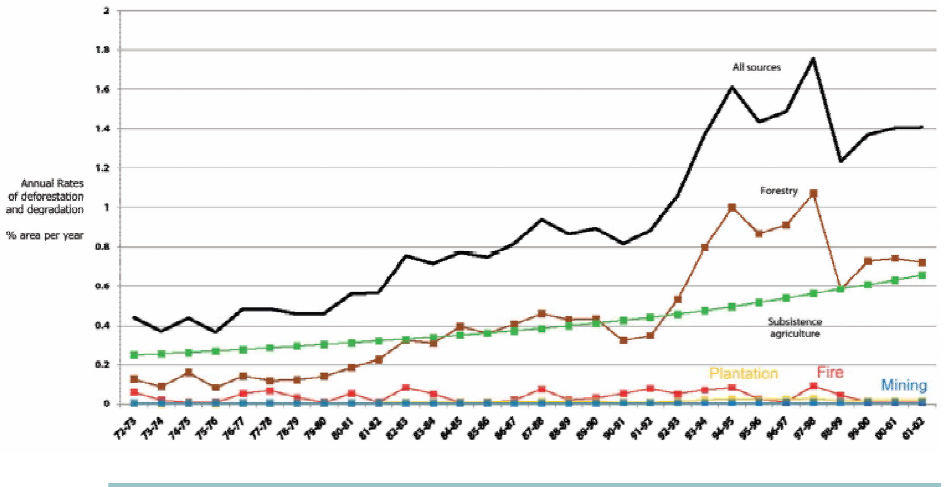
Forestry: UPNG Report

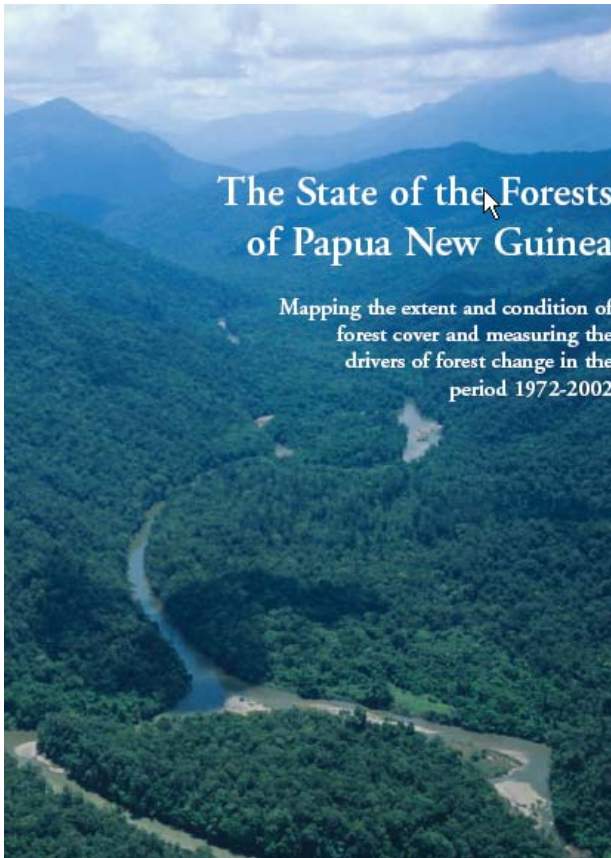
- **Data:** Two datasets: 1972 land-cover map and the land-cover map for approximately the year 2002. The lost of forest cover over 30 years estimated at 15% (0.5% per year).

- **Projections:** A progressive and increasing deforestation trend based on a socio-economic model. Carbon data defaults.

- **Results:** Deforestation rate for 2002 is estimated at 1.41% and that 83% of all the commercially accessible forest area cleared or degraded by 2021.

Conclusions: Important PNG internal policy tool, but even if could be favorable for PNG, can not yet be used to assess emission reference scenario -- as not IPCC compliant. Refinement necessary.





Reference Scenario

- **Historical data:** *activity data and emission factors*

- **Adjustment for development:** *based on national circumstances, environmental, social and economic factor*

- **Economic sustainability of REDD:** *e.g. in future the reference scenario or incentives may be adjusted in order to guarantee the permanence of REDD positive effects*

Forest Carbon Stocks

PNG plans to assess & evaluate 5 IPCC Carbon Pools

Above-ground biomass

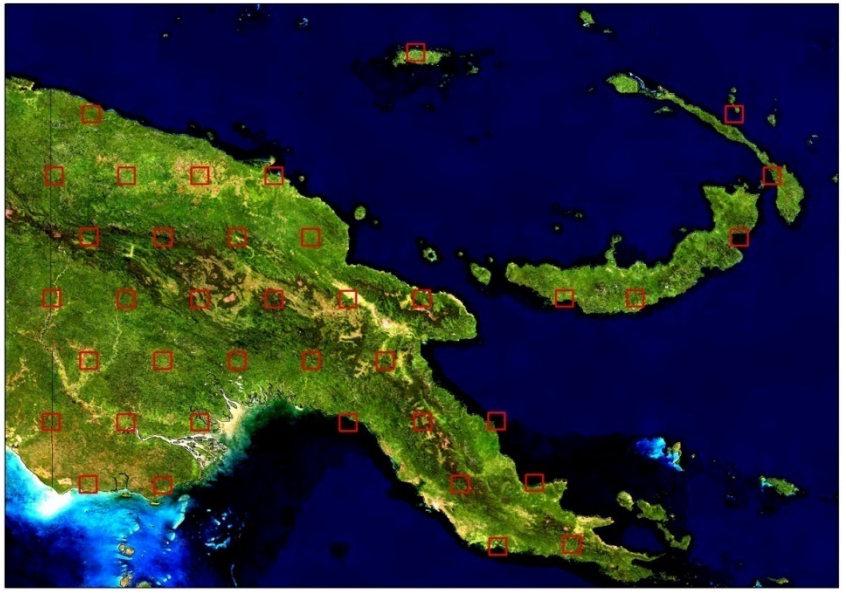
Litter, deadwood, soil & organic matter.

Below-ground biomass

Historical data: activity data and emission factors

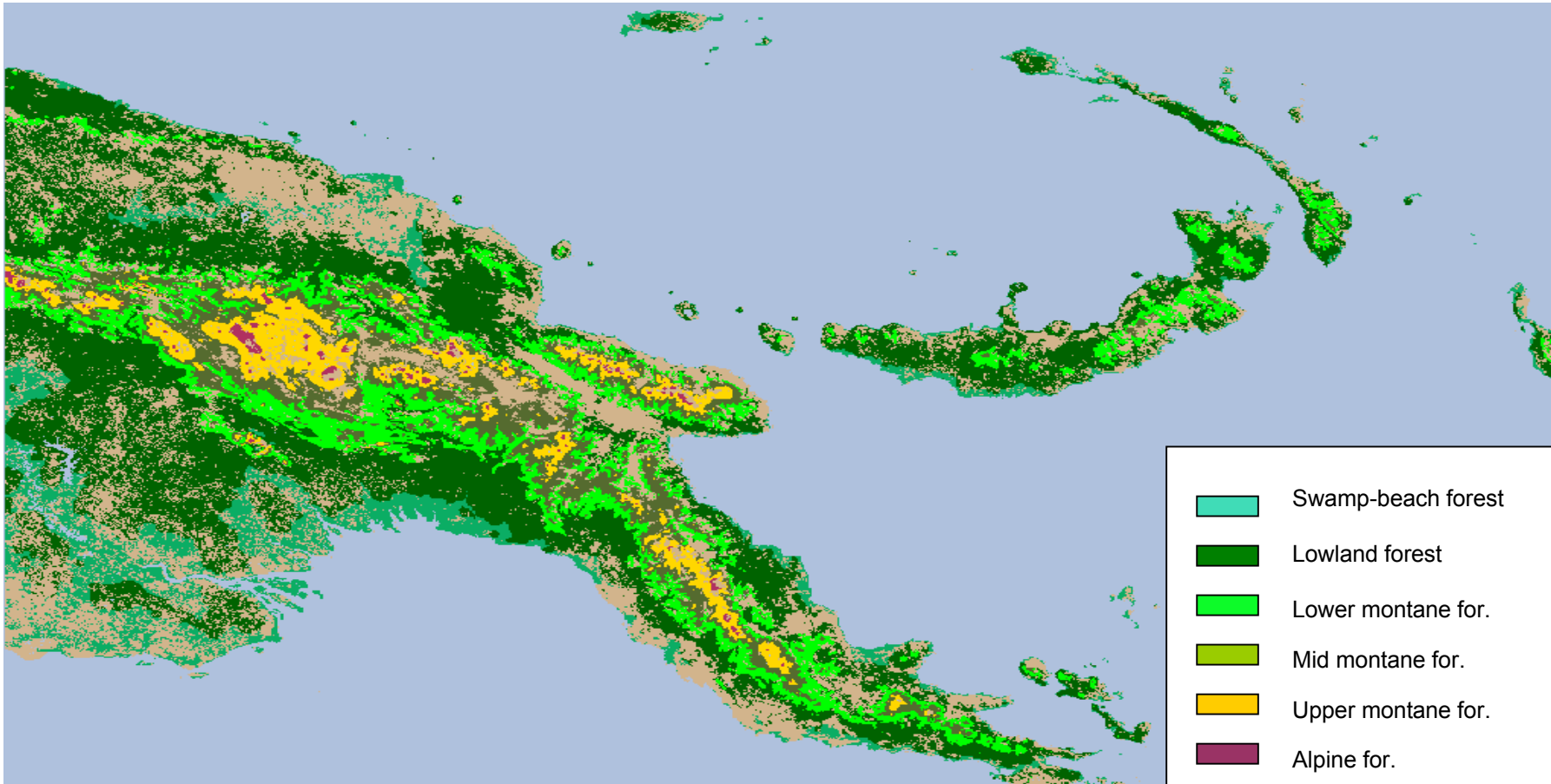
PNG, through a scientific cooperation with the European Commission Joint Research Centre and the Max Planck Institute for Biogeochemistry, has already successfully evaluated the feasibility to assess historical emission rates in forest land according to IPCC LULUCF Good Practice Guidance reporting requirements.

Different methodologies have been tested to track land uses and land use changes and to assess changes in forest carbon stocks.



Historical data: activity data and emission factors

To assess and report forest area and carbon stock changes, PNG forest land has been stratified in 6 strata which represent different levels of carbon content. Thus each strata will be a reporting “activity data subdivision” and the relative emission factors will be assessed independently.



Historical data: activity data on deforestation

- To assess historical forest area changes three NASA satellite datasets will be used:
  - 1990 circa Landsat TM
  - 2000 circa Landsat ETM+
  - 2005 circa Landsat TM and ETM+

- These datasets represent the only useful data that are available for PNG to assess changes in forest land use consistently.

- To assess changes in forest land use a revised version of the methodology developed by the Brazilian “Prodes Analogico” project will be evaluated.

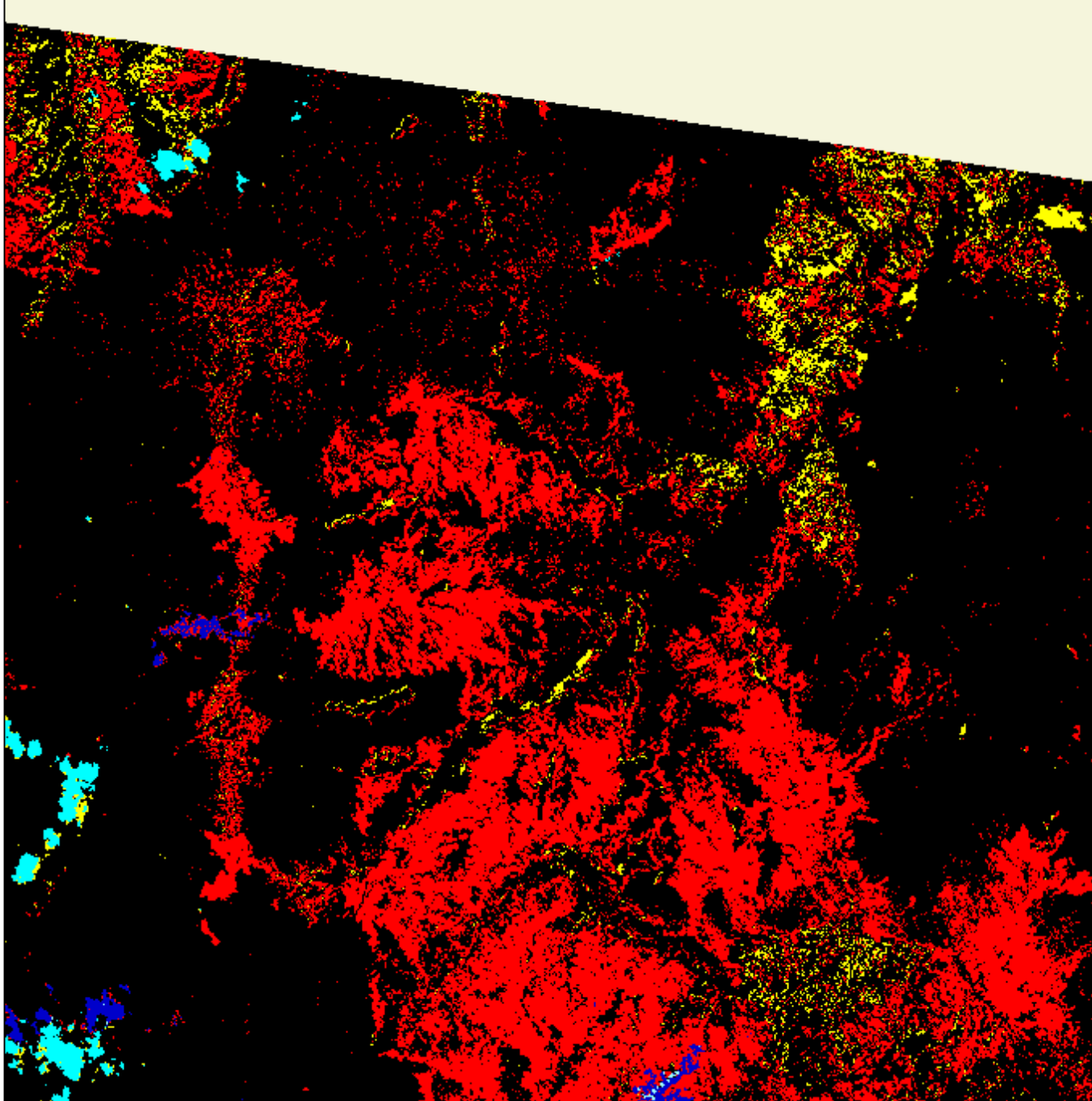
- A systematic sampling approach have been used to monitor forest area changes between 1990 and 2000, later changes will be assessed through a wall-to-wall approach.

- With this methodological approach PNG will have two periodical data on deforestation rates: from 1990 to 2000 and from 2000 to 2005.

EXAMPLE 1

eforestation due to
nsustainable land
se

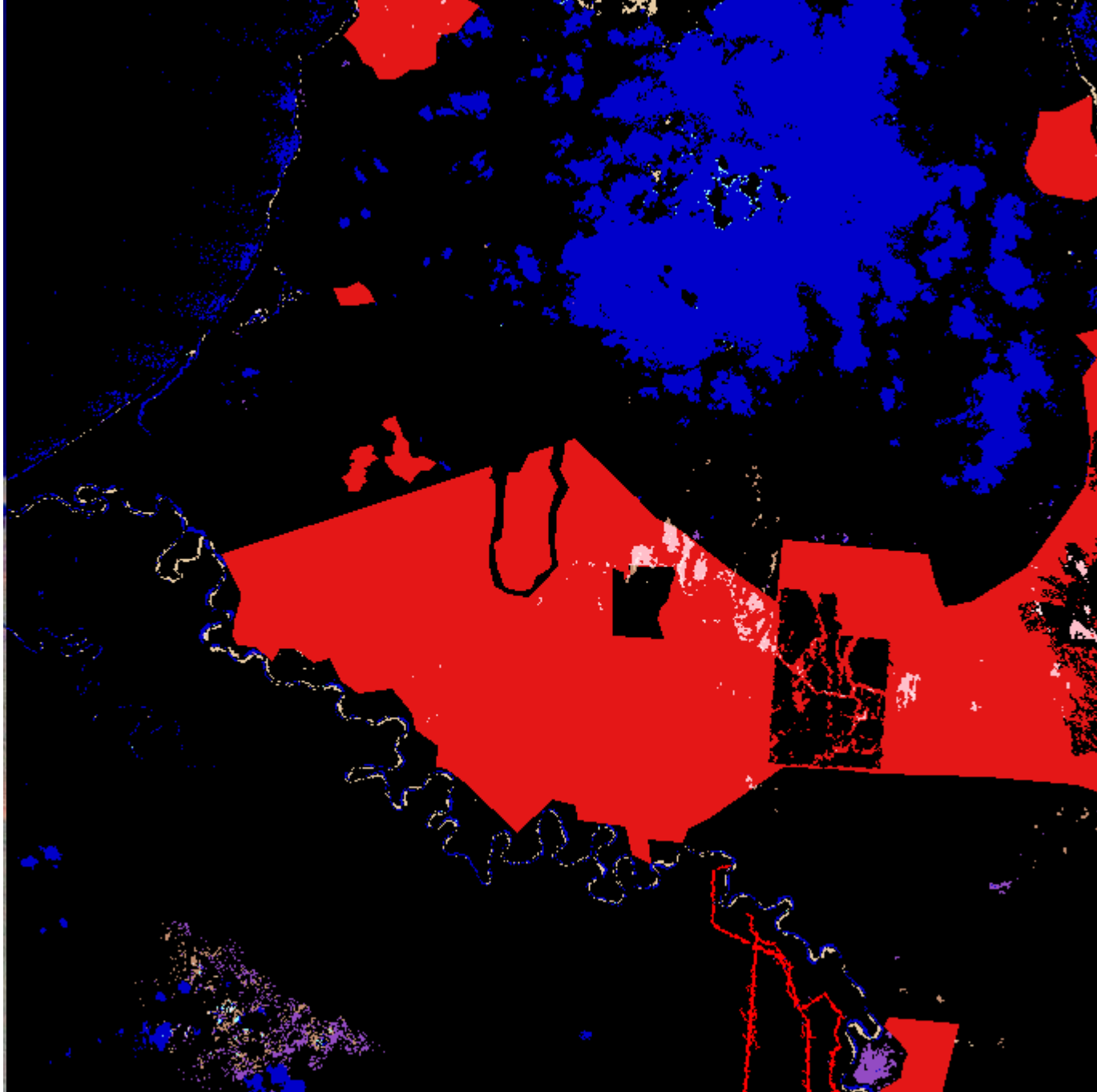
Area changes from
1990 to 2000



XAMPLE 2

eforestation due to
l palm plantations

Area changes from
1989 to 2000



Historical data: activity data on forest degradation

- To assess historical changes in forest carbon stocks in forest land remaining forest land the same three NASA satellite datasets (1990, 2000, 2005) will be used to estimate activity data. In this case PNG will use the “indirect approach” suggested in the REDD “SourceBook” by Gofc-Gold.

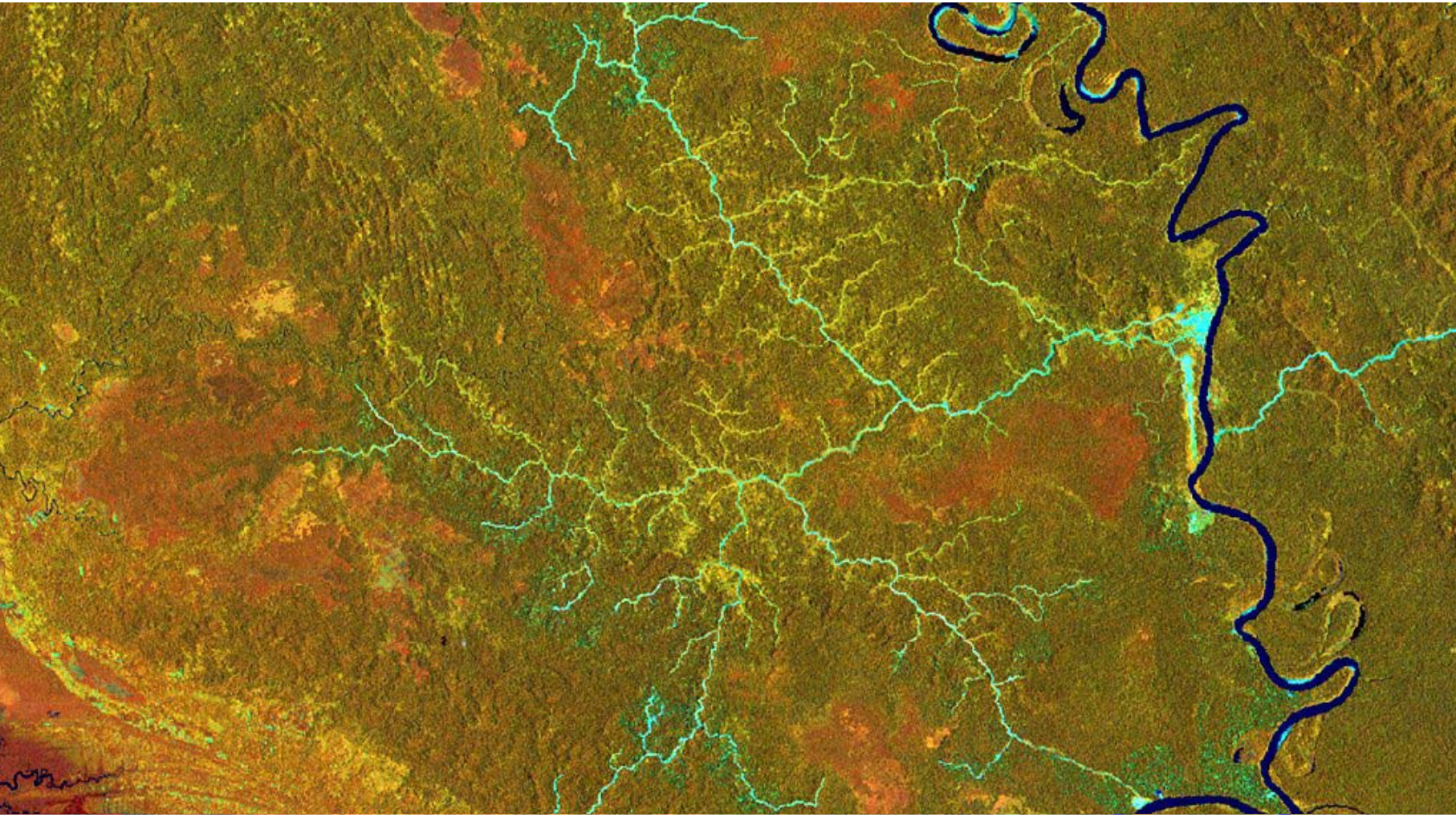
- This approach requires the distinction by RS data and GIS techniques of forest land in intact and non-intact that has been indentified as a proxy to detect forest land without anthropogenic disturbance so as to assess the carbon content present in the forest land.

- A systematic sampling approach have been used to monitor the expansion of the non-intact forest between 1990 and 2000, later changes will be assessed through a wall-to-wall approach.

- With this methodological approach PNG will have two periodical data on forest degradation rates: from 1990 to 2000 and from 2000 to 2005.

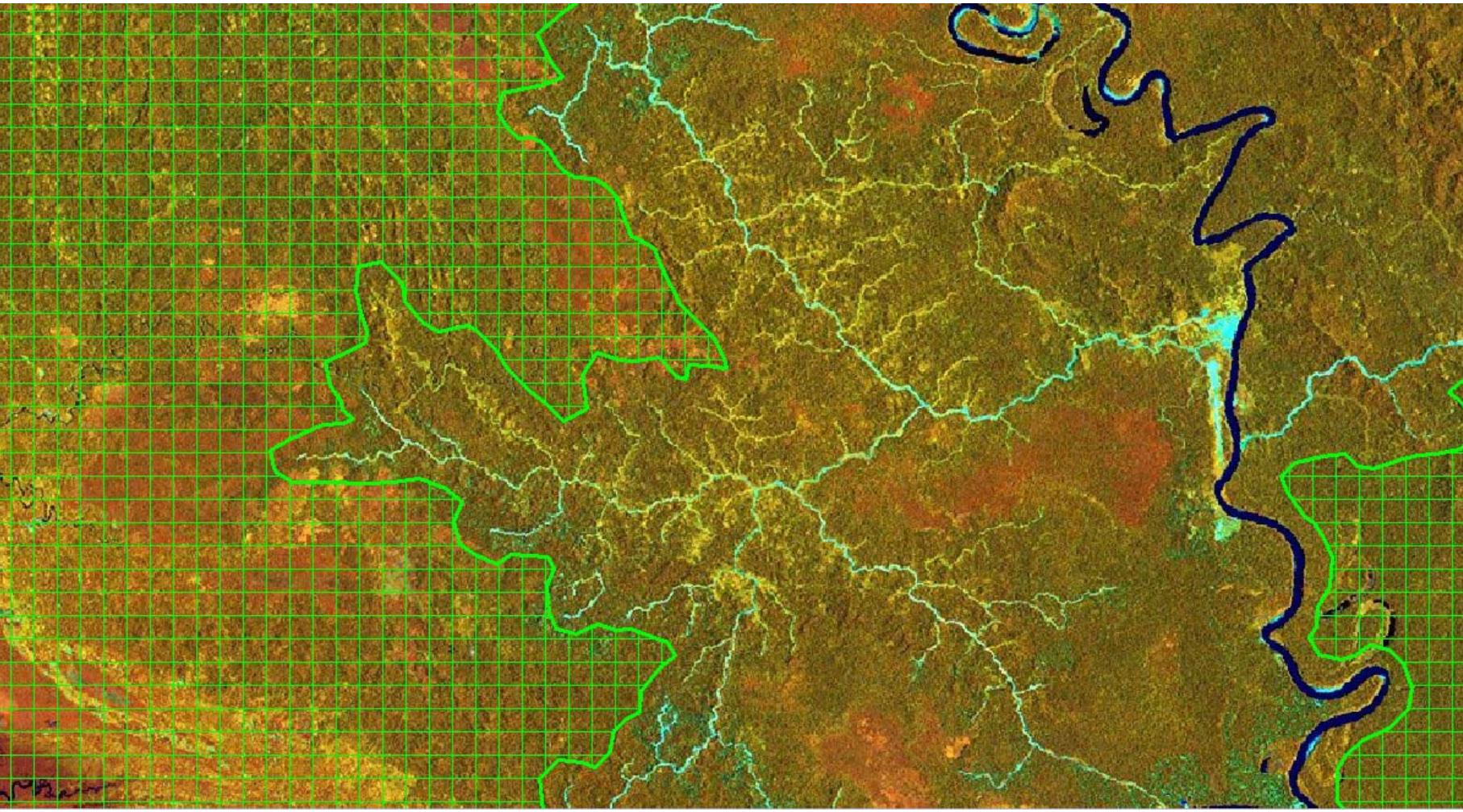
Historical data: activity data on forest degradation

Monitoring expansion of selective logging activities from 1990 to 2000



Historical data: activity data on forest degradation

Detecting intact forest area reduction from 1990 to 2000



Historical data: emission factor

- In order to assess and report emission factors in forest land PNG will expand its permanent sampling plots (PSP) to all the national forest land before 2012

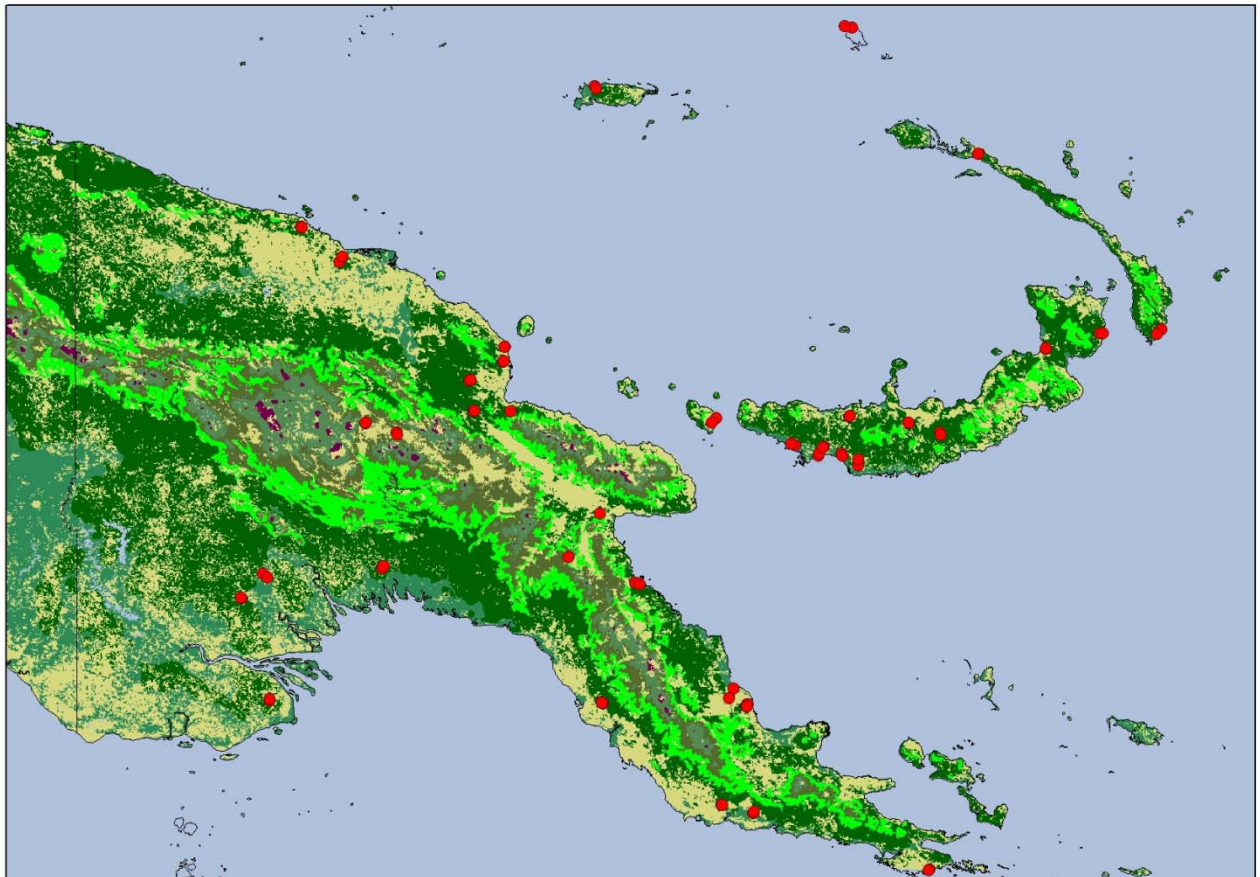
- All plots will be measured with a new measurement protocol that will include all carbon pools

- The new PSPs will be allocated according to a stratified (restricted) random sampling approach.

- The number of sampling units to select per stratum will be determined calculating the number of units required to reduce emission factors uncertainty < 5 % at 95 % CI

Existing Permanent Sampling Plot Network

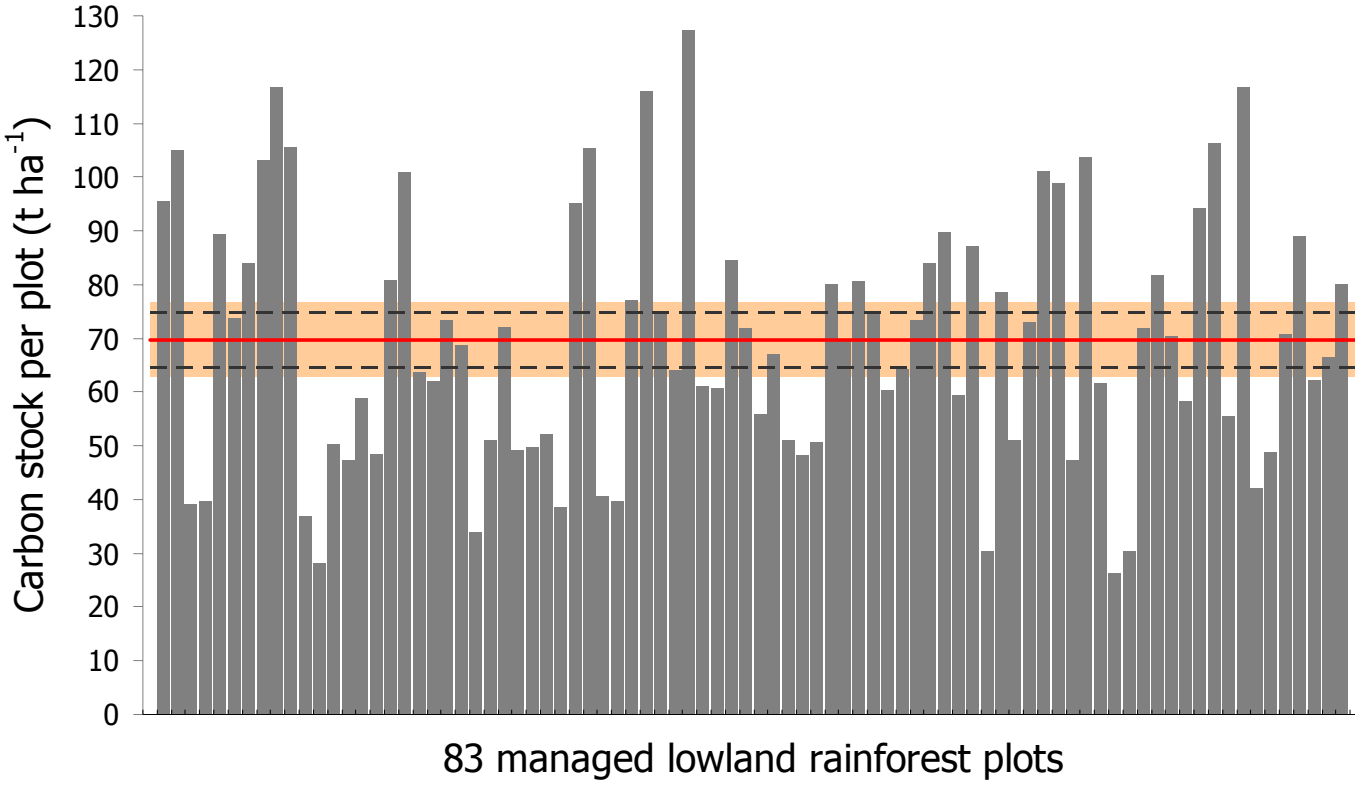
- **Distribution:** mainland and five adjacent islands
- **Established:** since 1992
- **Scale:** currently 135 plots operational



Historical data: emission factors

Assessment of the above-ground biomass carbon pool

- **Non-intact lowland forest:** 70 t C ha^{-1} (83 plots)
- **Present situation:** 6.2 % of uncertainty (i.e. random errors) at 95 % CI
- **Ambition:** 125 plots required for < 5 % uncertainty at 95 % CI

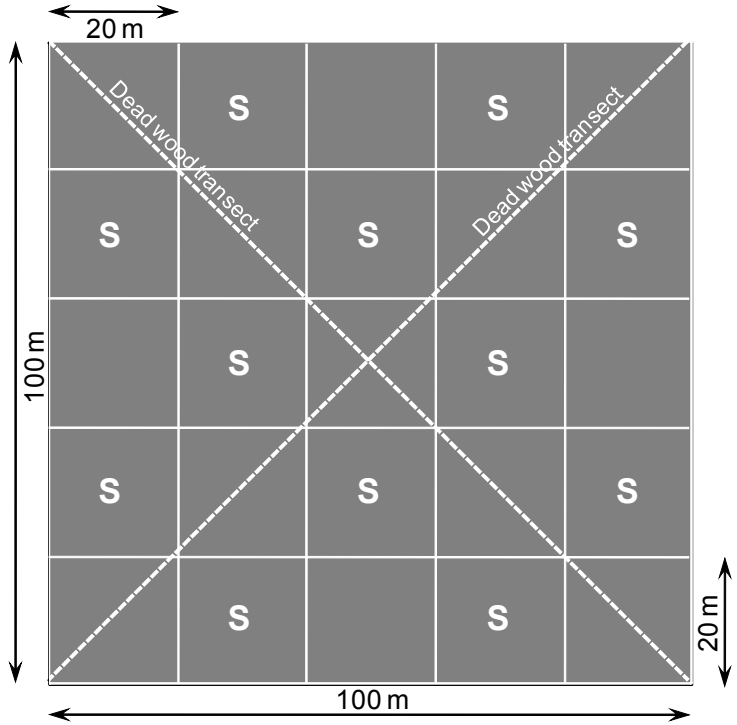


PNG aims to assess biomass at < 10 % uncertainty (due to random errors) because it will likely also increase the accuracy, despite the uncertainty of the reduced emissions (trend uncertainty, IPCC 2006

Historical data: emission factors

Assessment of the litter and soil carbon pools

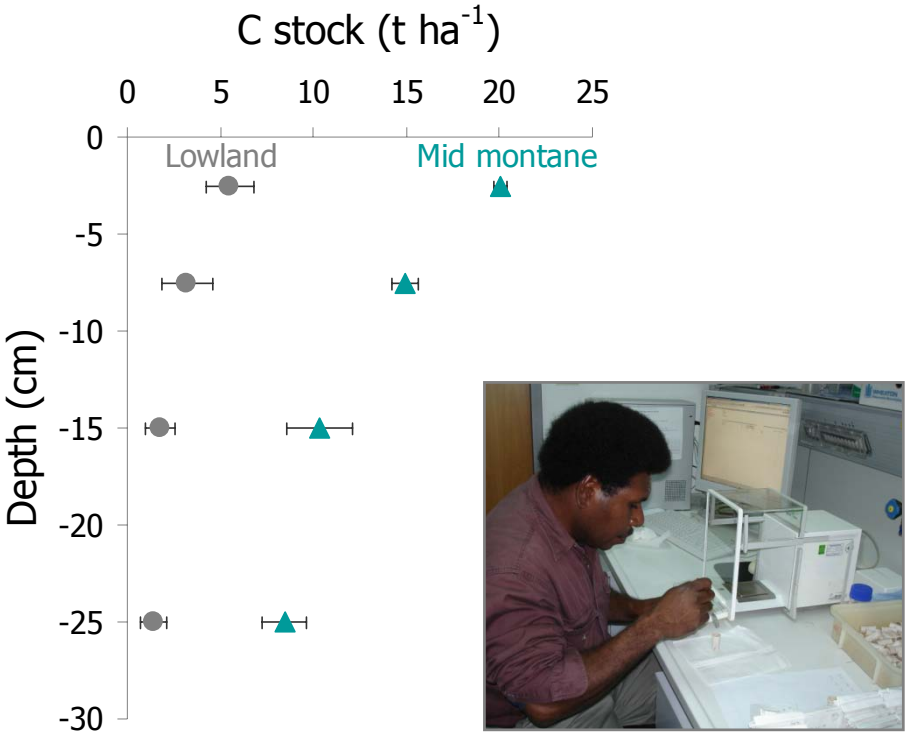
- **Grid:** 12 sample points per plot, assessment of top 30 cm & litter
- **Resolution:** 4 depth increments of 0-5, 5-10, 10-20, 20-30 cm
- **Recorded Parameters:** moisture, density, C, N, pH
- **Correction scheme for soil skeleton**
- **Number of available samples:** 272 (188 Lowland, 84 mid montaine)

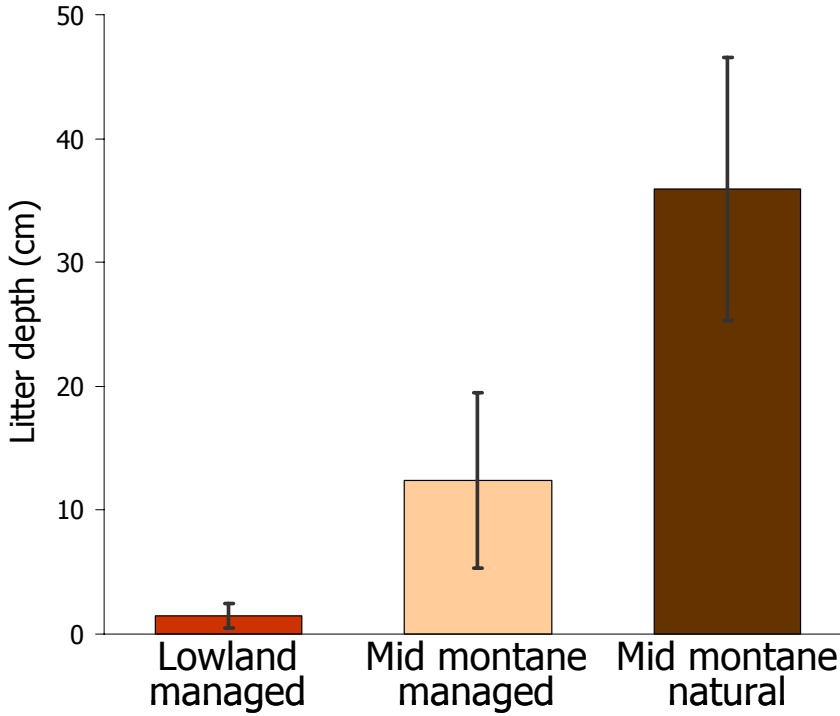


Historical data: emission factors

Soil carbon – first results

- **Large soil carbon pool:** 53 t C ha^{-1} in managed lowland forests
- **Large soil carbon potential:** >100 t C ha^{-1} in montane forests
- **Litter:** Additional large pool expected at least in montane forest litter





REDD: Monitor & Report

- **Forest Area Monitoring Unit:** Assess changes in forest land use after 2012 PNG. The Unit evaluating monitoring system similar to the "Prodes digital" project developed by Brazilian INPE. Thus forest area changes will be monitored and report annually through a wall-to-wall approach.

- **Carbon Field Inventories Unit:** Assess changes in emission factors PNG. This Unit will have to maintain and expand the national PSPs network through periodically (3-5 years) re-sampling measurements.

- **IPCC Tier-3:** The reporting system will be based on the IPCC LULUCF Good Practice Guidance and most recent IPCC Guidelines. PNG will report forest area change using GPG2003 Approach 3 and is willing to report changes in emission factors at GPG2003 Tier 3.

Closing Observations

- **Basic Data Available:** PNG experience demonstrates that basic data can be found – sometimes in surprising places.
- **Cost Effective:** Generally, can be assembled to be both IPCC compliant and cost effective.
- **Incentive to Improve:** PNG to start with Tier-2 sampling and improve to Tier-3 by 2012.
- **Reference Scenario:** Can assemble basic data. Policy discussions necessary – national circumstances, consistent revenue streams, etc.

Time for Policy Discussions!