

Land tenure issues in tropical forests: whom to pay for biodiversity conservation?



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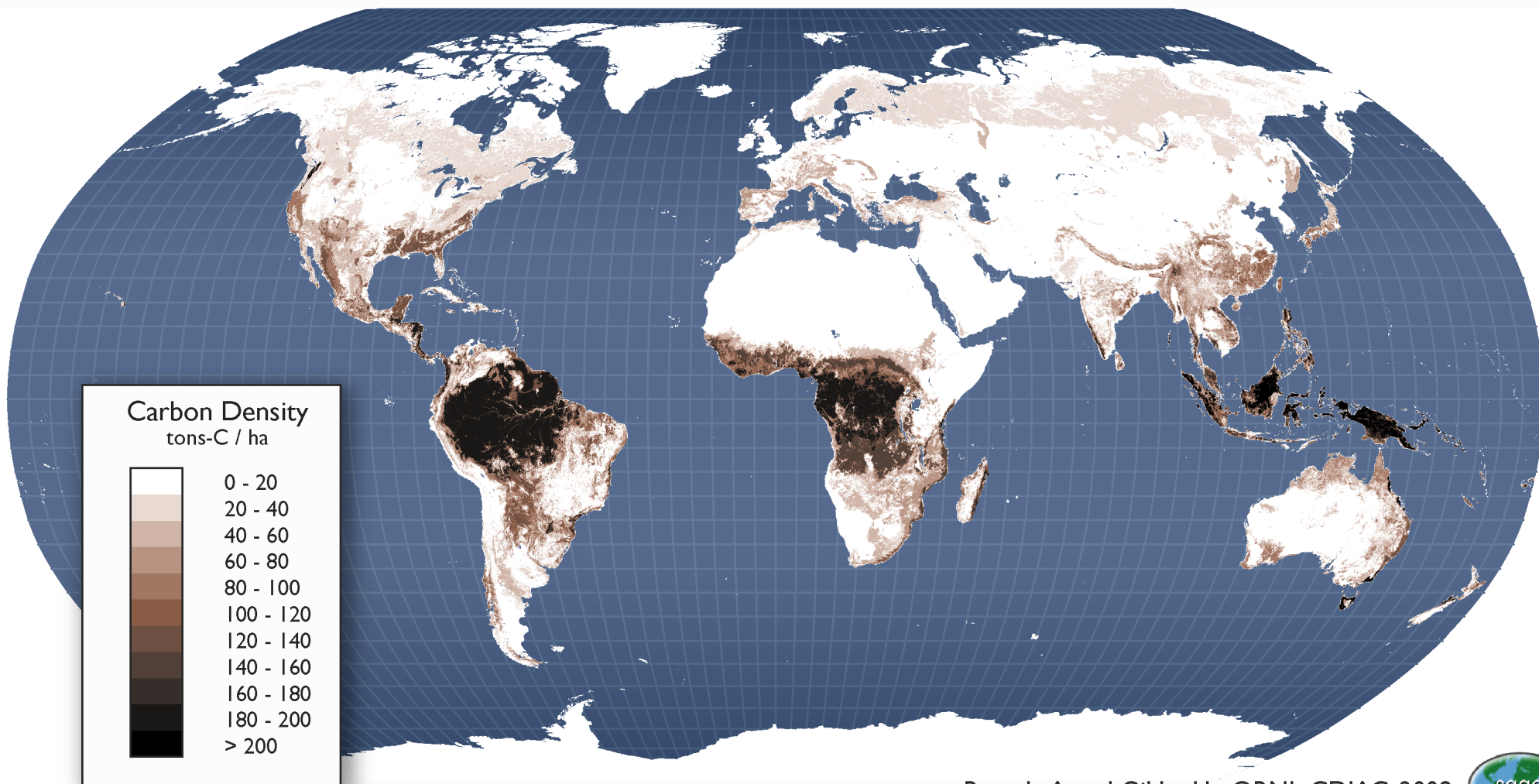
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Above and Below-ground Living Biomass Carbon Stocks, 2000



Ruesch, A. and Gibbs, H. , ORNL-CDIAC, 2008



Inadequate attention to property rights & tenure in PES, esp. 'pro-Poor' PES

Too often: Land Tenure \neq Land Title

Land tenure: *the terms on which something is held. i.e. the rights and obligations of the holder. [...]*
Resource tenure describes rights to land, water, trees and other resources. J. Bruce, 1999

Local tenure varies according to local ecologies & social structures.



Land Tenure Center

Why Tenure Matter for PES:

Case study from Uganda illustrates key issues:

1. Uncertain tenure puts biodiversity & poor at risk.
2. Uncertainty allows elite to capture communal land & resources
3. Uncertain property rights is politically advantageous – cheap flow of wood energy source to urban populations



Focus: Kibale National Park in Albertine Rift.

Biodiversity hotspot.



**Nature
tourism,
3rd largest
source of
GNP,
Uganda**

T. Harris 2005



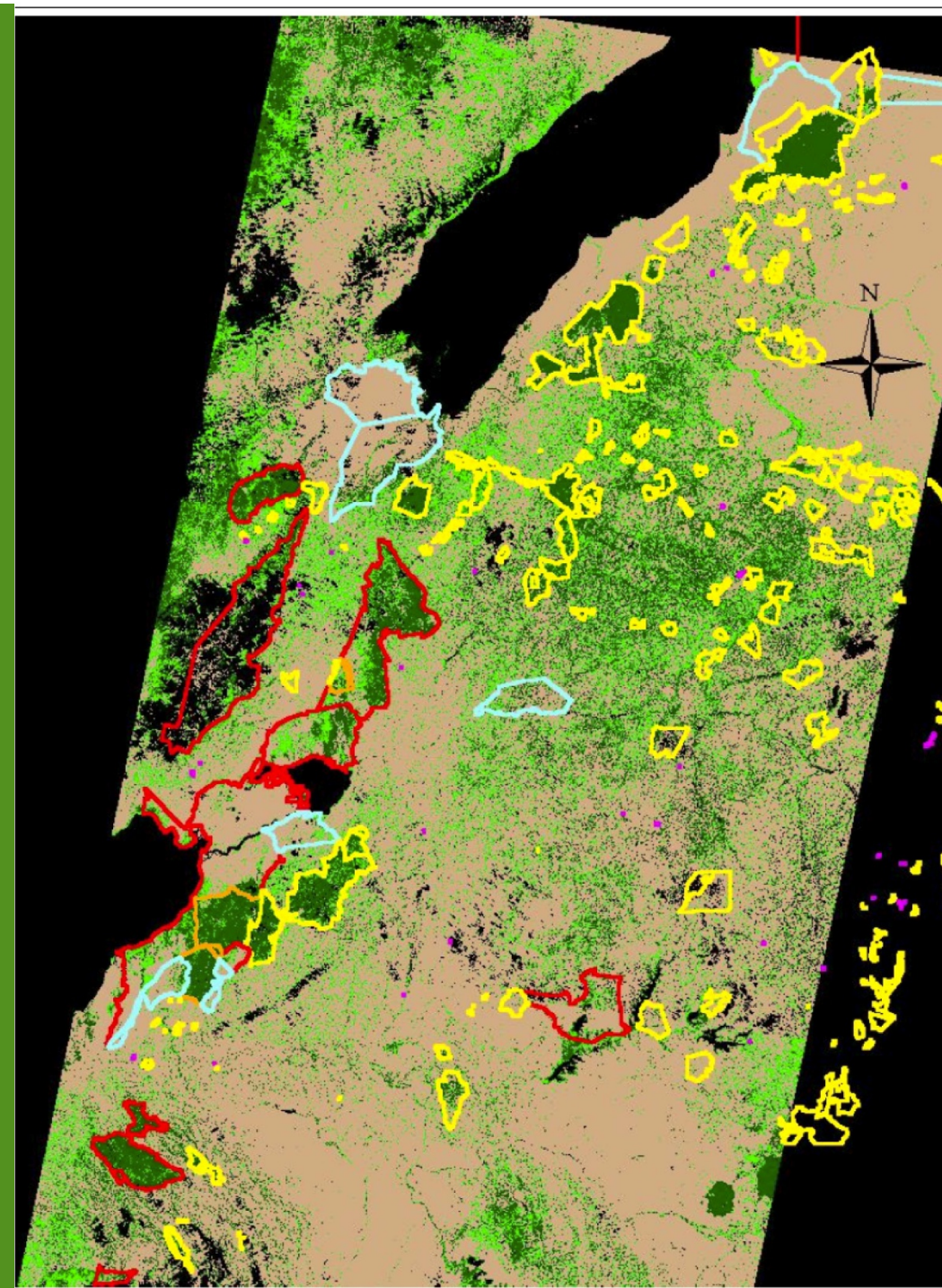
Example: Aberdares
Forest, Kenya

Drinking water and
hydroelectric power for
Nairobi (~3 million
people)

~\$55 million/year

Local benefits:
Fuelwood
Water
Medicinals





Ugandan Albertine Rift

1900-1985: 80%
closed canopy
forest lost

1985-2005: 860 sq
km forest lost,
~0.7%/yr

WCS, 2006

Proximate causes of deforestation in Ugandan Albertine Rift:

agricultural expansion

charcoal manufacture



Underlying forces of deforestation around Kibale:

- population growth (↑ 300% since 1970)
- tea expansion (↑ 350% since 1980)



High energy demand



Fuelwood and charcoal = 98% of rural energy
90% of urban energy



Uncertain land & forest tenure – transition from customary to formal privatized system



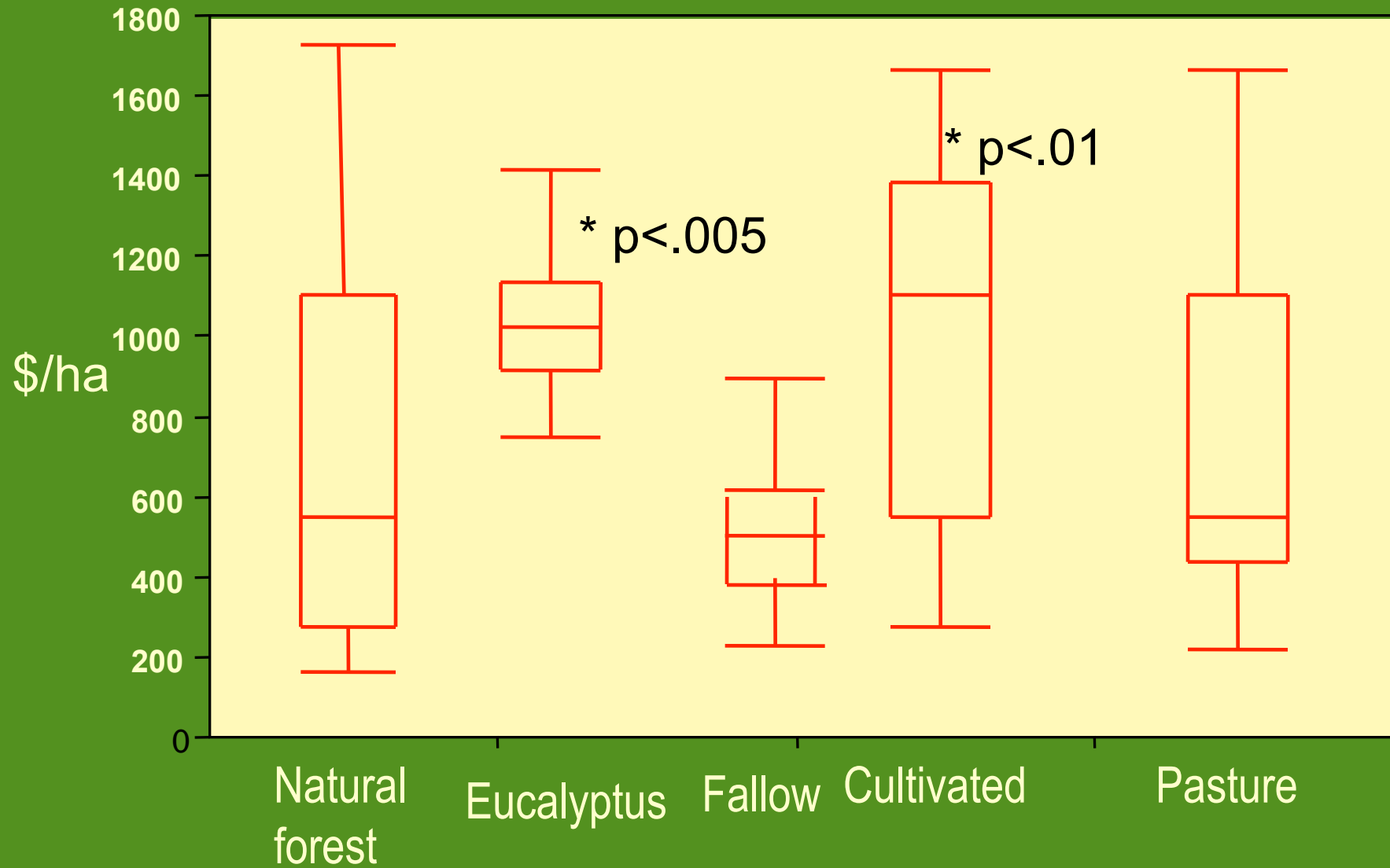
Charcoal: a poor
man's
business:

Underpriced.
landowner sells
\$2/sack
urban market
\$13/sack
Corrupt license system.

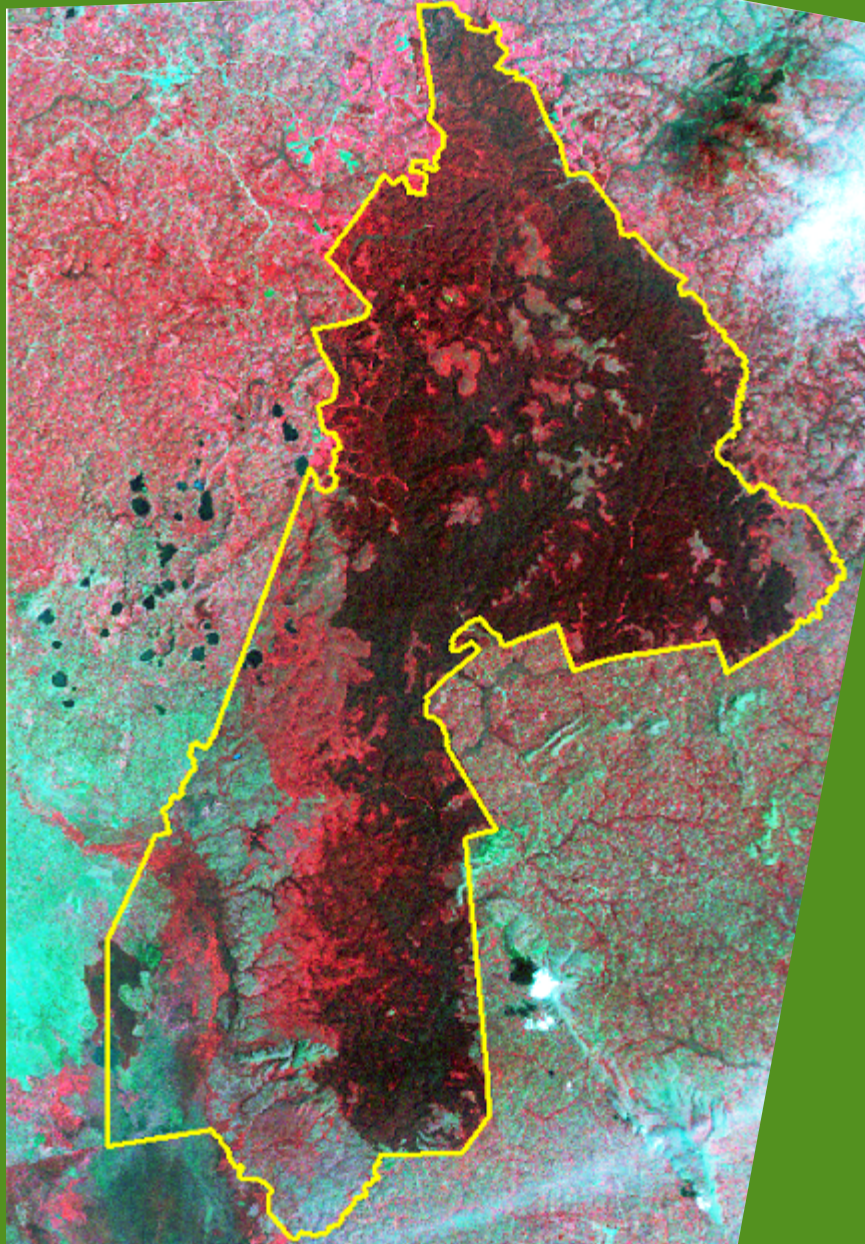


**Natural forest = common pool resource
with some species privatized
Planted eucalyptus forest = private property**

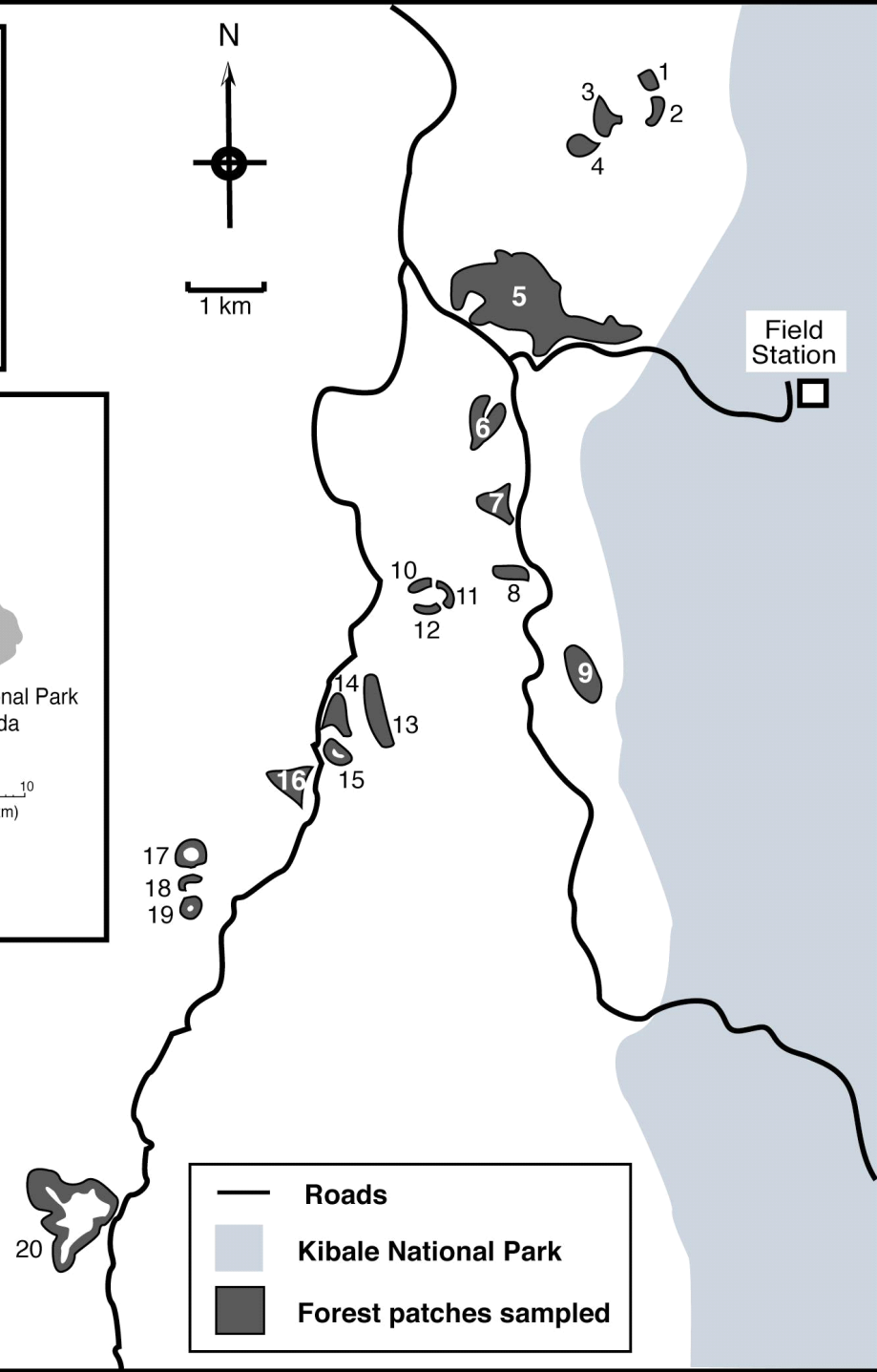
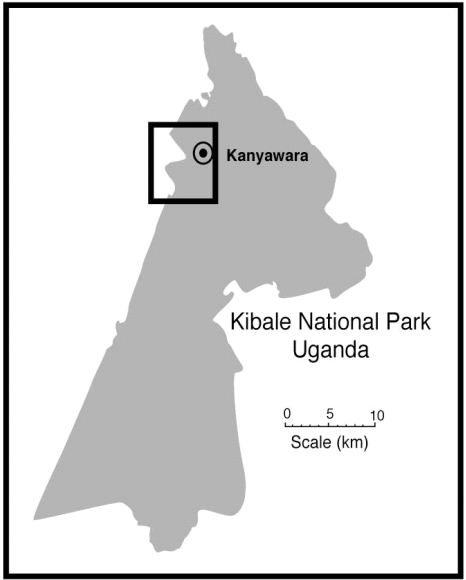
Reported land prices around Kibale (n=102)



Kibale National Park



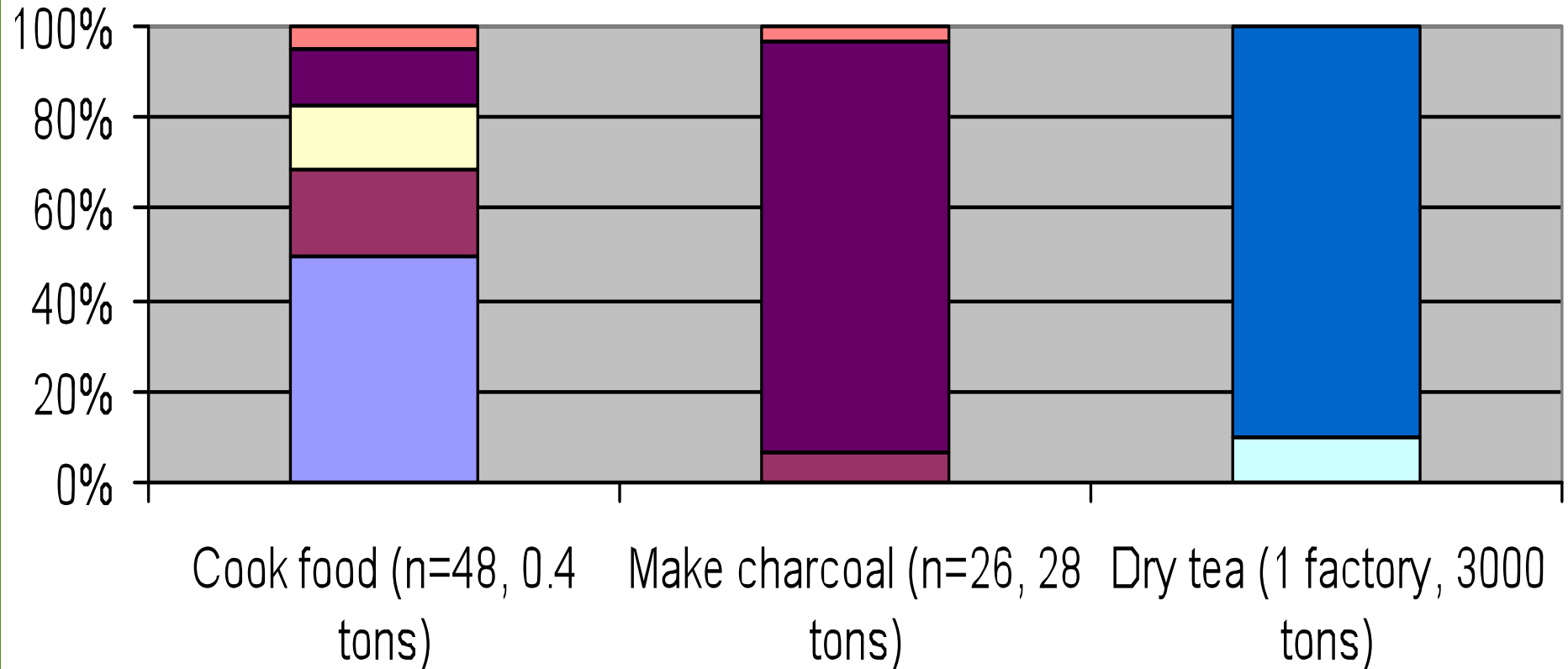
2001 Landsat ETM+
Bands 4, 3 and 2



90 sq km
Study area

C. Chapman

Land tenure vs. type of wood energy use



■ Fallow-own

■ Fallow-nbr

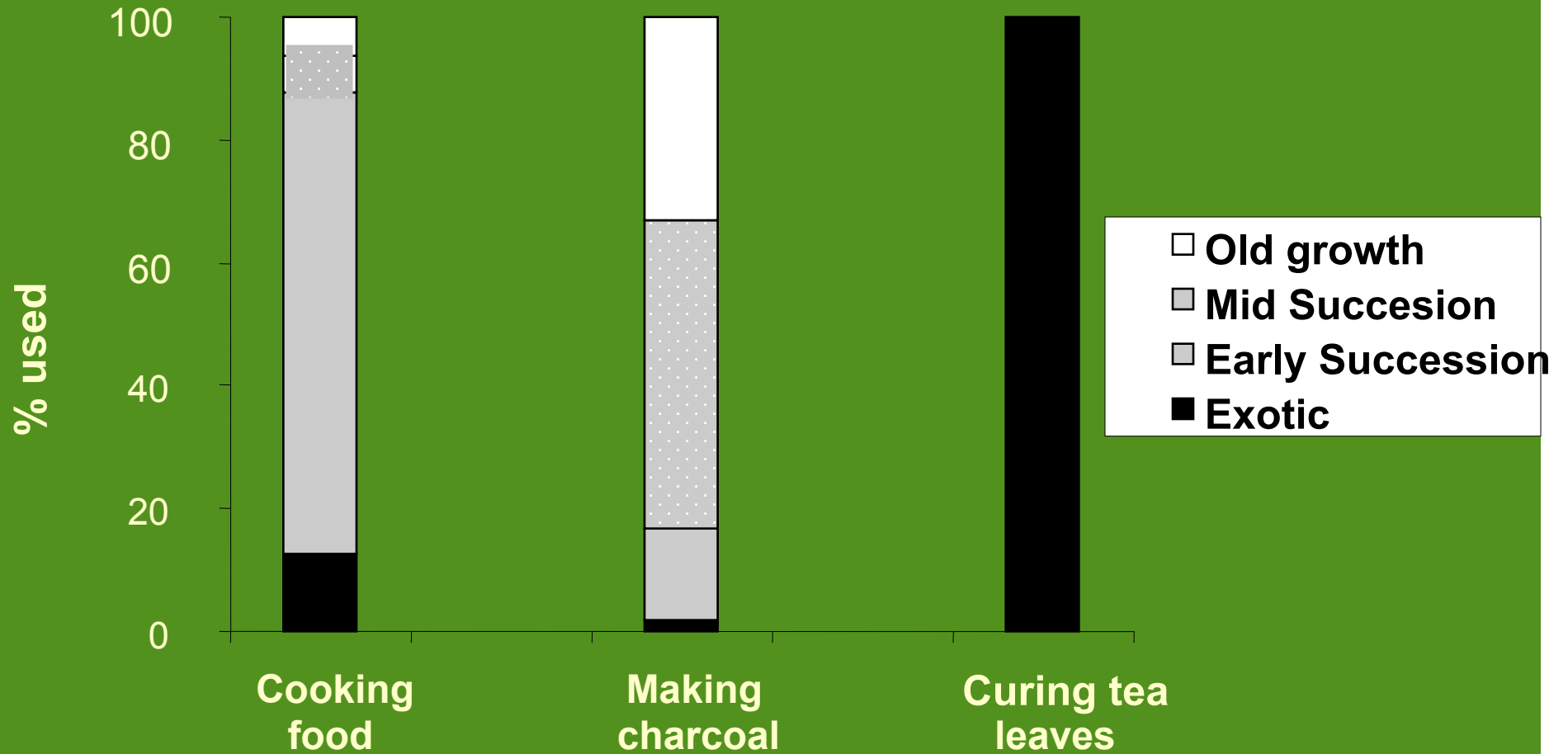
■ Woodlot-own

■ Woodlot-nbr

■ Forest patch

■ KNP

■ Corporate plantation



Type of woody species used

(Naughton-Treves et al 2006)

Longitudinal study, 1995-2006 biodiversity & local welfare

Forest patches,
1995-2005 (n=34)

Landsat and Aster
images
GPS ground truthing
Canopy species count

Primate spp. presence/
absence

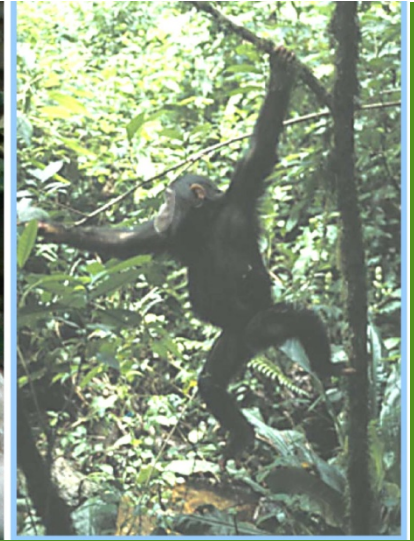
Households,
1998-2006 (n=244)

Wealth indicators & assets
(roof type, livestock,
employees, eucalyptus,
water source, wage
labor, farm size)

Land transactions

Decline in forest patch size (n=34), 1995-2005

| | Forest loss 0-5 km <u>outside</u> <u>park</u> , annual % | Forest loss 0-1 km <u>inside</u> park annual % |
|-----------|----------------------------------------------------------------------|---------------------------------------------------------|
| 1995-2001 | 2.8 (.77) | 0.2 (.1) |
| 2001-2005 | 3.5 (1) | 0.3 (.08) |



| | | | | |
|-----|----|----|----|----|
| P/A | 9 | 13 | 10 | 10 |
| A/A | 1 | 3 | 12 | 19 |
| P/P | 16 | 13 | 6 | 3 |
| A/P | 8 | 0 | 6 | 2 |

34 forest patches

Chapman et al 2003



Change in human welfare



| Wealth indicators | <u>1996-2006</u> Δ% households (n=244) |
|------------------------------------------------------------|-------------------------------------------------------|
| Livestock | 33% ↑ |
| Employees | 25% ↑ |
| Safe water | 13% ↑ |
| Eucalyptus | 13% ↑ |
| # Eucalypts/per household | 108%↑ |
| Farm size change – large farms (>6 ha, n=37) | 4%↑ |
| Farm size change – small farms (<1 ha, n=55) | 22%↓ |



Land loss via 'Distress sales' or abandonment



**Forests as land bank
and safety net.**



Conclusions

- FOREST ↓ HUMAN WELFARE ↑ (*average*) *but* poorest of the poor suffer from deforestation.
- Deforestation accelerated by land tenure uncertainty
- Powerful political & economic reasons for unclear property rights
- National park maintains forest

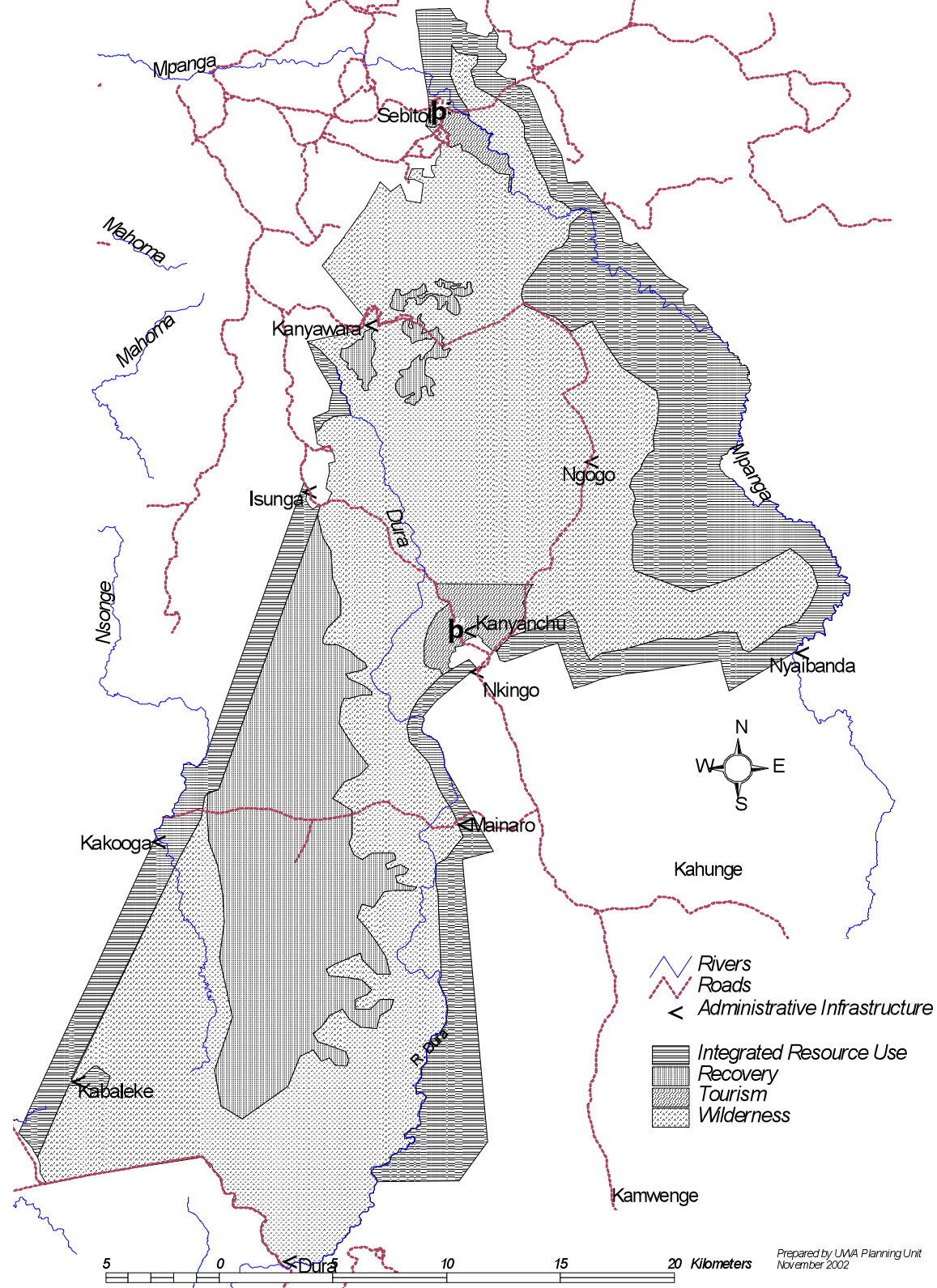
Pro-Poor PES must invest in Governance:

- Implementation of Land-(use) reforms
- Legislative & Institutional reforms
- Improve law enforcement

Range of Conservation Interventions

Contracts with communities for NTFP use in Kibale







Payments for Ecosystem Services
employing citizens to reforest land and limit fires
in park corridor



Reform in tea industry (more efficient wood use, better labor treatment).



National Issues.

Reform Charcoal Industry

More efficient production (better kilns, cooperatives).

Licensing and pricing that reflects environmental costs.

Long term: shift to alternative fuel sources (e.g hydroelectric, elephant grass (*Penisetum* spp.) or eucalyptus for biomass energy).

Tropical forests offer the "single largest opportunity for cost-effective and immediate reductions of carbon emissions"
UK Stern Report, 2006

Side benefits:
biodiversity,
poverty alleviation



Adapted from S. Pagiola
WORLD BANK, 2009

Broader conclusion: “REDD-Readiness” must include investment in governance

1. Design pricing system
2. Conduct forest inventory
3. Technical capacity building
4. Carbon stock assessment: different levels
5. Measure deforestation rates to create baselines
6. Finance additional inventories, permanent plots

Where to draw
the line
between
readiness and
investments?

Governance:

Implementation of Land-(use) reforms
Legislative reforms
Institutional reforms
Improve law enforcement
Financial sector reforms

