Estimer les impacts économiques du REDD : le calcul des coûts d'opportunité

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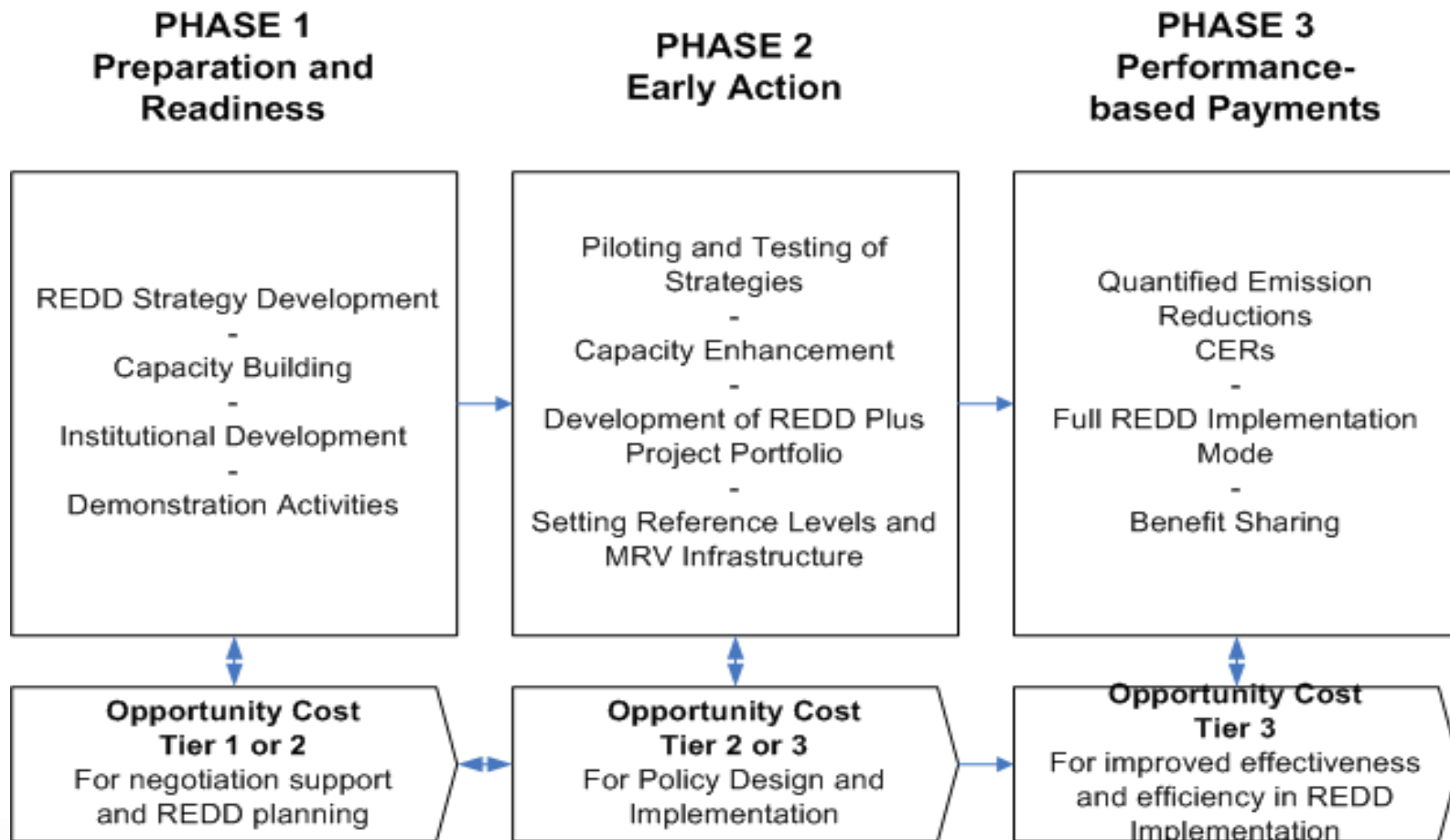*Journée de la Foret en Afrique Centrale, Yaoundé, 2009*

# What costs and Benefits

Costs	Benefits
Opportunity costs (Opportunities forgone/ as a results of not doing something)	**Carbon / Climate benefits**
Implementation costs (Policies, etc)	**Biodiversity**
Transaction Costs (MRV, etc)	**Monetary**
	Water Benefits

When to do opportunity costs analysis?

Benchmark of southern Cameroon

➔ strong north-south population and resource use
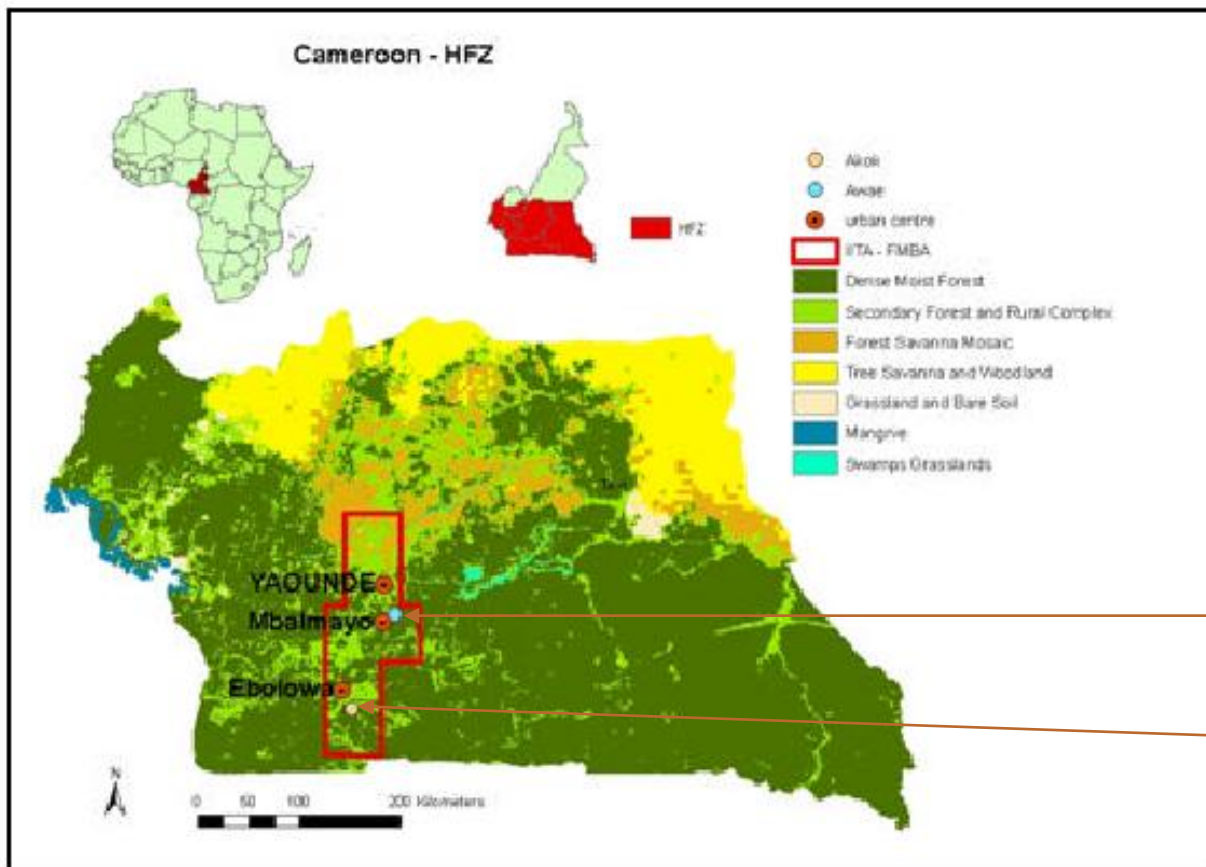
1.5 Mha
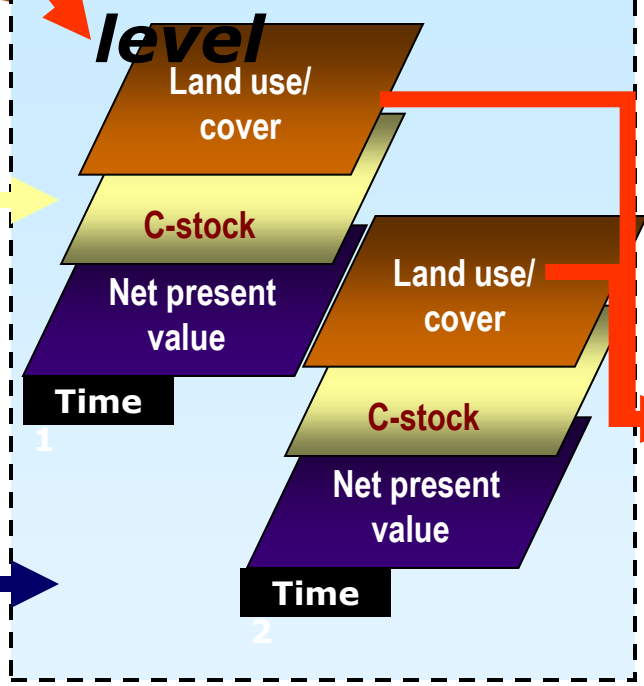
Two study sites:

- Awae

- Akok

Remote sensing data interpretation and spatial analysis

Time-averaged C-stock of land use

Private and social profitability: Net Present Value of land use

Time series at pixel level

Land use/ cover

C-stock

Net present value

Time

1

Land use/ cover

C-stock

Net present value

Time

2

LULC C

Δ time-averaged C-stock= CO_2 emission

Δ NPV= economic gain

$$3.67 * \frac{NPV_{before} - NPV_{after}}{Cstock_{after} -} \text{ in \$ / t } CO_2eq$$

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Land use systems

- Two forest systems
    - ➜ **high forest,**
    - ➜ **secondary forest**
- Three agroforestry / tree crop systems
    - ➜ **extensive cocoa**
    - ➜ **extensive cocoa with fruit**
    - ➜ **intensive cocoa with fruit**
- Two fallow / mixed landscape mosaics
    - ➜ **mixed food crop / short fallow**
    - ➜ **melon-seed / plantain / long fallow**

AWAE, land cover maps

1951

1984

2001
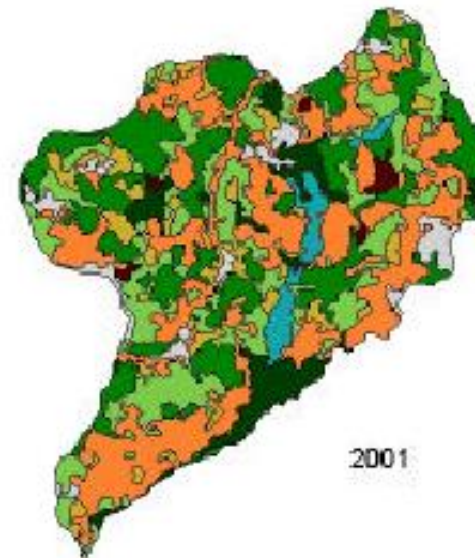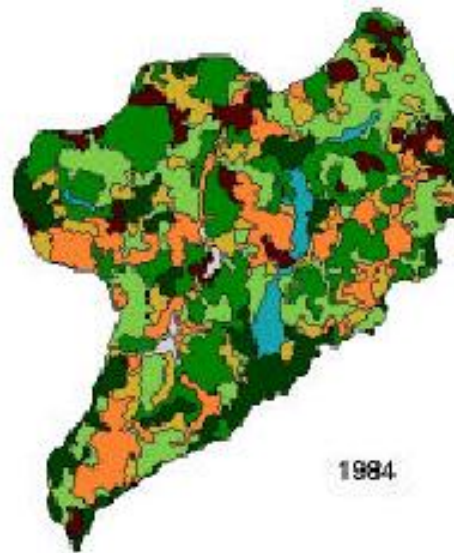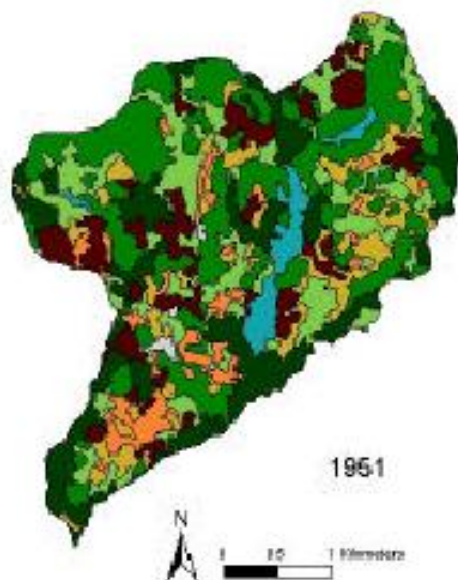
Land Cover Classes

- bare surface
- clouds
- dense high forest
- flooded swamp forest
- fragmented forest / herbaceous patches
- fragmented forest / shrubland -woody patches
- grassland
- herbaceous vegetation on waterlogged soil

- houses
- multi-layered forest
- short shrubland /herbaceous plots - cultivated plots
- shrubland / herbaceous patches

Village infrastructures and natural features

- residential units
- footpath
- gravel
- track
- water course

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Time-averaged C Stocks

Time-averaged total system carbon in land uses
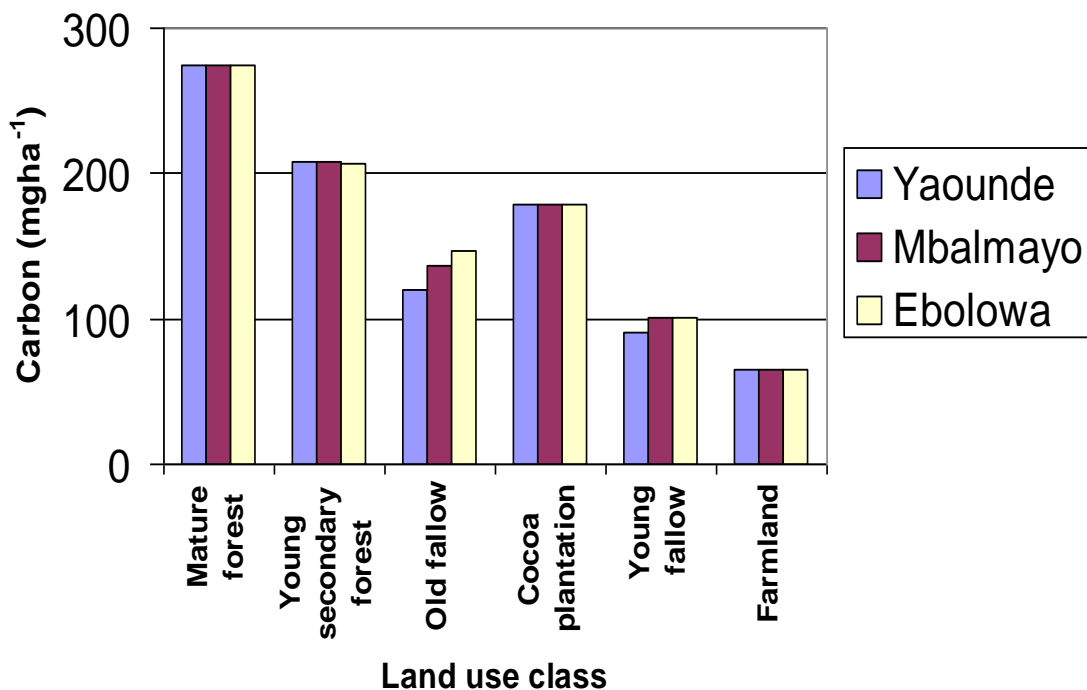
Time-averaged carbon stock

= C-accumulation rate * C-residence time

= average C-stock over the life cycle

= average over a landscape mosaic of all phases (if system is stable)

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C-stock & NPV_priv of land uses

	Time-averaged	
	C-stock	NPV_priv
Land Uses:	Mg/ha	$/ha
high forest	250	309
secondary forest	200	128
extensive cocoa (only Akok)	141	7,096
extensive cocoa w/fruit (only Awae)	141	21,192
intensive cocoa w/fruit (only Awae)	141	28,489
mixed food crop field/short fallow rotation	5	7,203
melon-seed/plantain/long fallow rotation	63	10,879

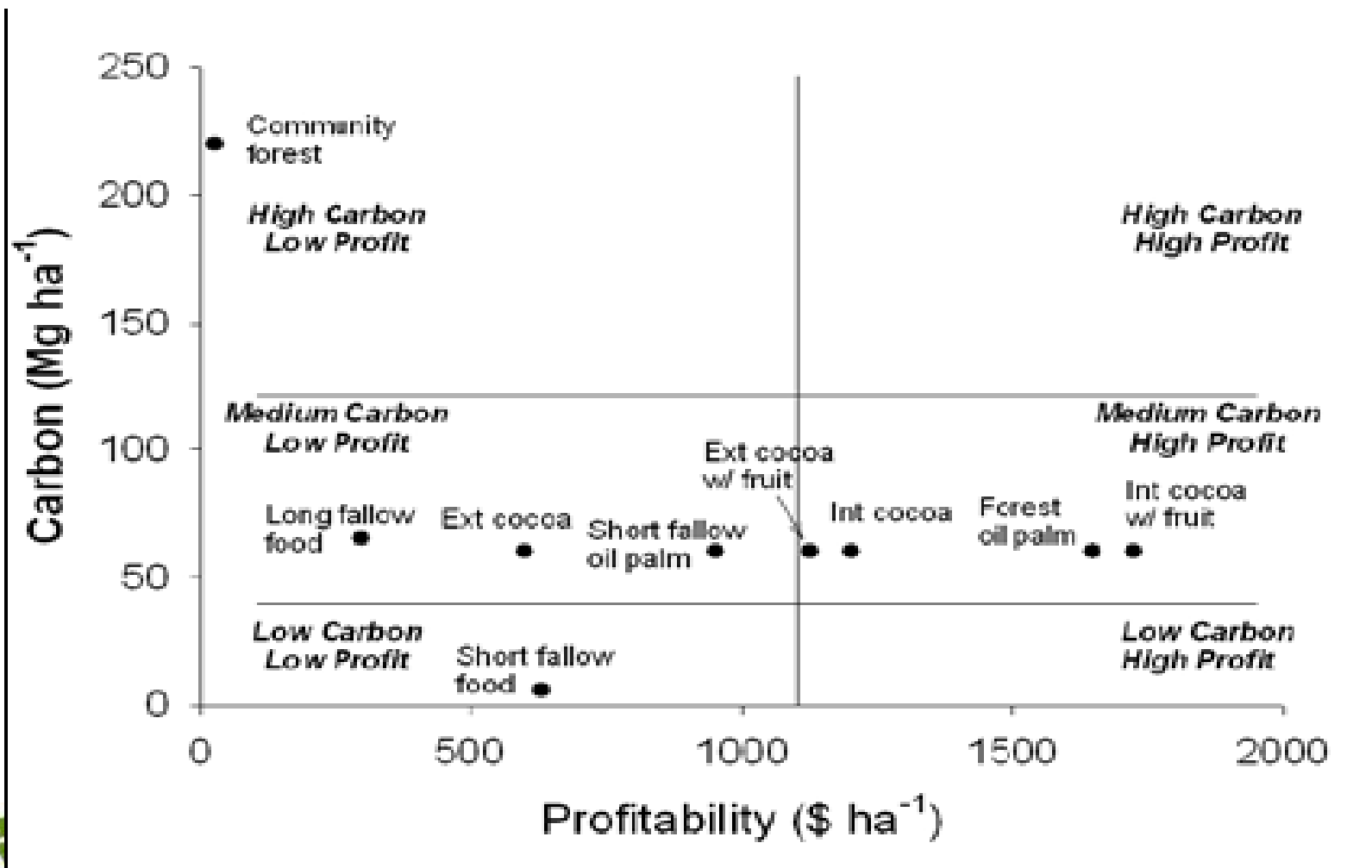# Carbon emissions abatement supply curve for Awae - a carbon emitting site
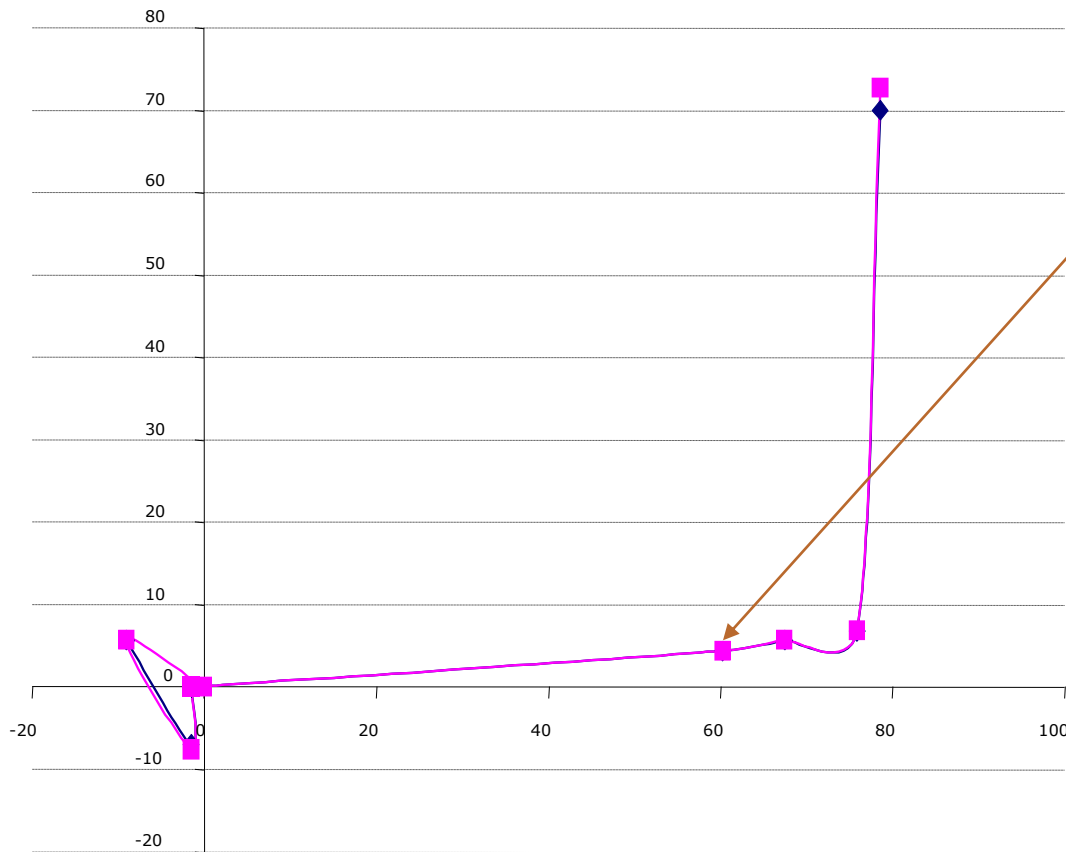
75% of emissions at 4 $/t of CO2-eq

Abatement costs, $/t CO2-eq/ha

Cumulative net emissions, t CO2-eq/ha

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Beware: Trade-offs (biodiversity / profitability etc

Findings / Conclusions

- About 80% of emitting land-use changes in the study areas since 1990 could have been offset by payments of less than $5 / tonne.

- Agroforestry and intermediate land uses offer best opportunities for meeting C, biodiversity, and poverty alleviation benefits

- Prospective studies needed as Future opportunity costs will depend on REDD incentives and land-use incentives , Price etc.

- Understanding cost and benefits in totality would require extensive research in our countries as current estimates of other costs remain coarse

MERCI / THANK YOU

See Swallow et al, 2007 and Robliglio, 2007 for details

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