Forestry Mitigation Potential and Cost in Mexico: The case of Scolel Té

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General outline of the presentation:

⇒ Background of Scolel Té project

Regional C-sequestration potential

- ⇒ Selected (agro-) forestry systems
- ⇒ Baseline definition
- ⇒ Cost-benefit analysis
- ⇒ Model outcome

Background

Location of the communities participating in the Scolel Té project

The project started in 1995 with a feasibility study.

In 1997 the first Proto-Carbon Credits were sold.

4 organizations are buying Proto-Carbon Credits, amounting to about US$ 120,000 per year.

Currently around 500 farmers and 5 communities are receiving Carbon Sequestration Incentives

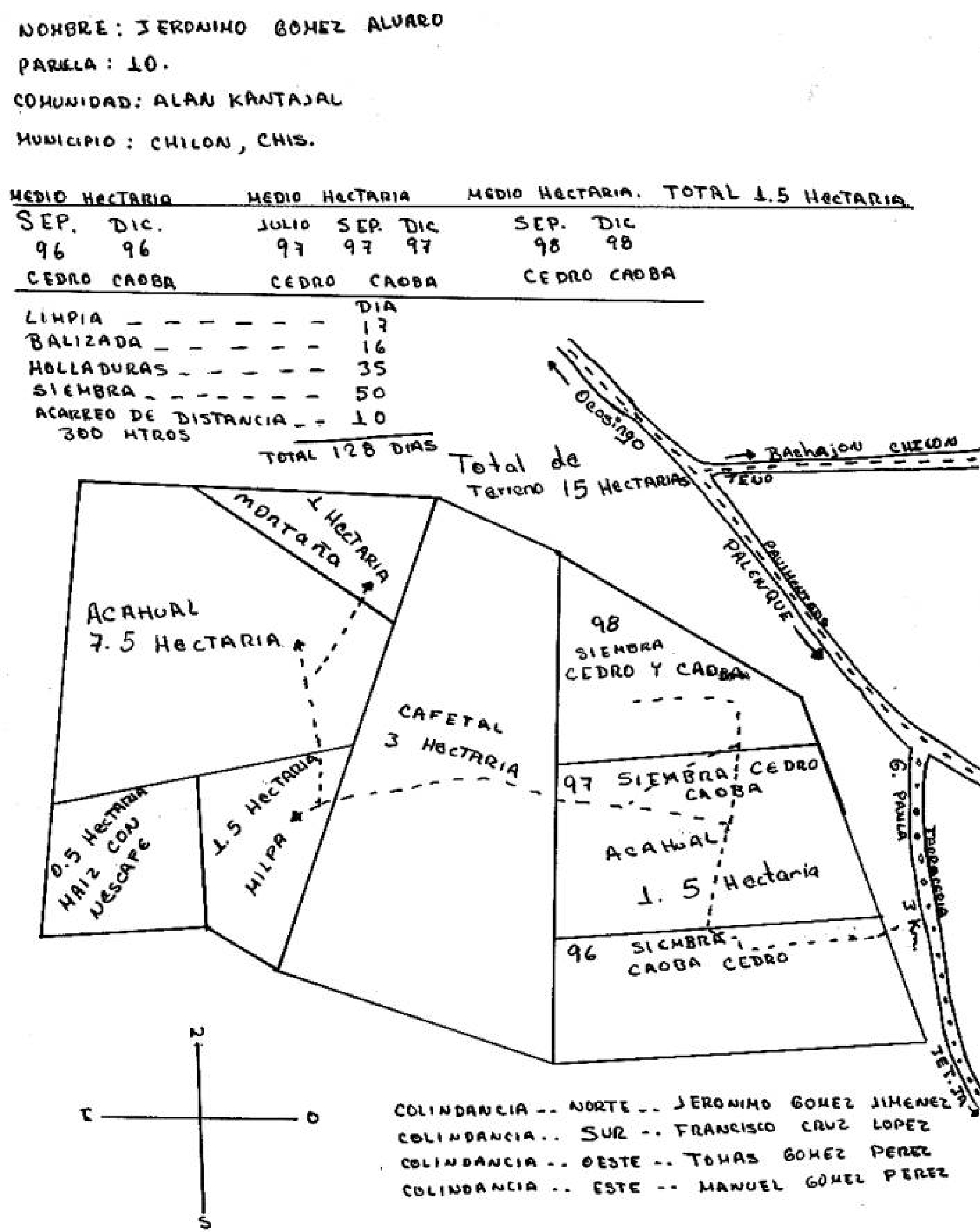
Number of participants, area committed, and tC purchased in two eco-regions of Chiapas, Mexico

Tropics	Hectares	Producers[1]	Potential ($tC\ ha^{-1}$)	Purchased[2] (tC)
Coffee with shade trees	101	101	73	2,801
Living fences	6	6	54	609
Taungya	153	149	146	8,357
Improved fallow	89	81	146	3,635
Forest conservation	3,000	3	100	3,000
Sub-tropics				
Forest restauration	47	13	137	3,588
Improved fallow	214	192	102	9,492

[1] Producers are either individual farmers or whole communities

[2] Difference between potential per ha and purchased due to part of carbon not yet purchased and risk buffer



“Plan Vivo”

Working plan

Translating small-scale projects that have a potential to mitigate carbon excesses in the atmosphere into the actual implementation of a large-scale project that can contribute significantly to the problem of climate change, raise important questions such as:

- Can farmers' selected (agro)-forestry systems cost-effectively mitigate CO_2 emissions, if implemented at a regional scale?

⇒1 C-sequestration potential at a regional level

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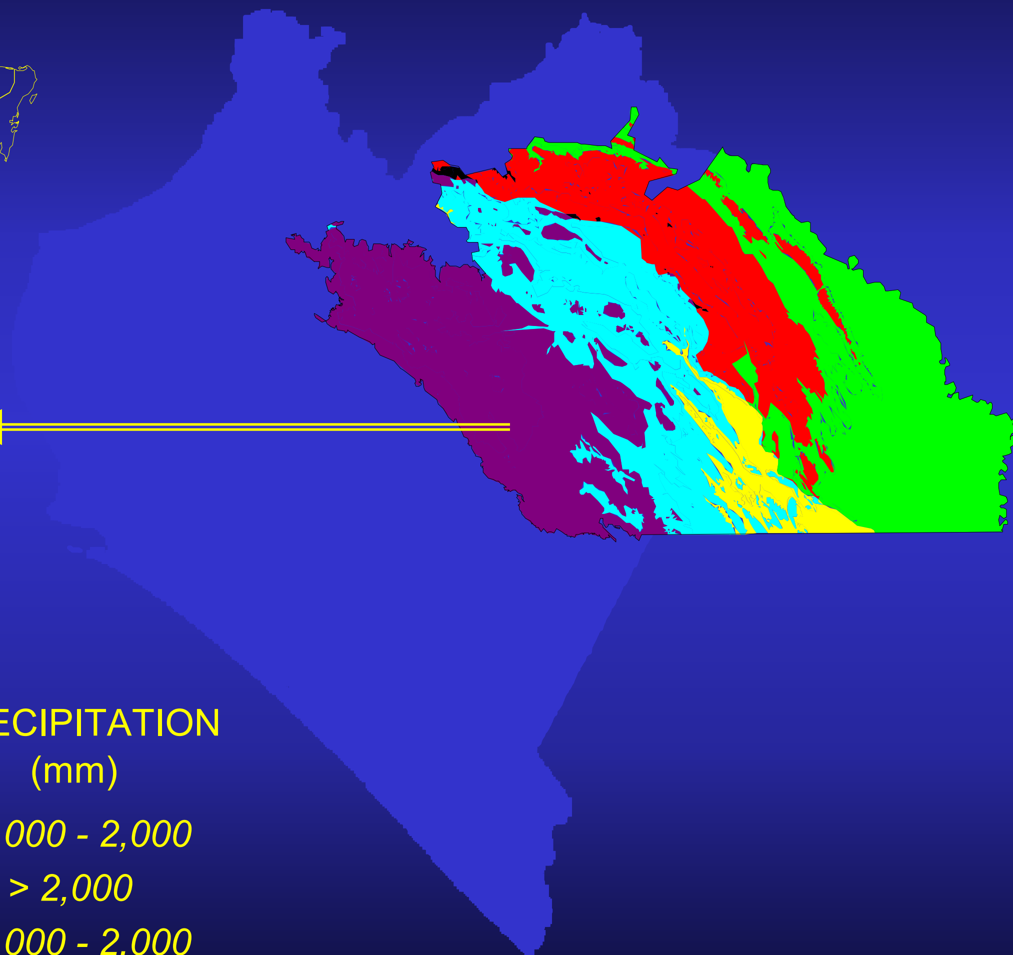
Study area

Chiapas

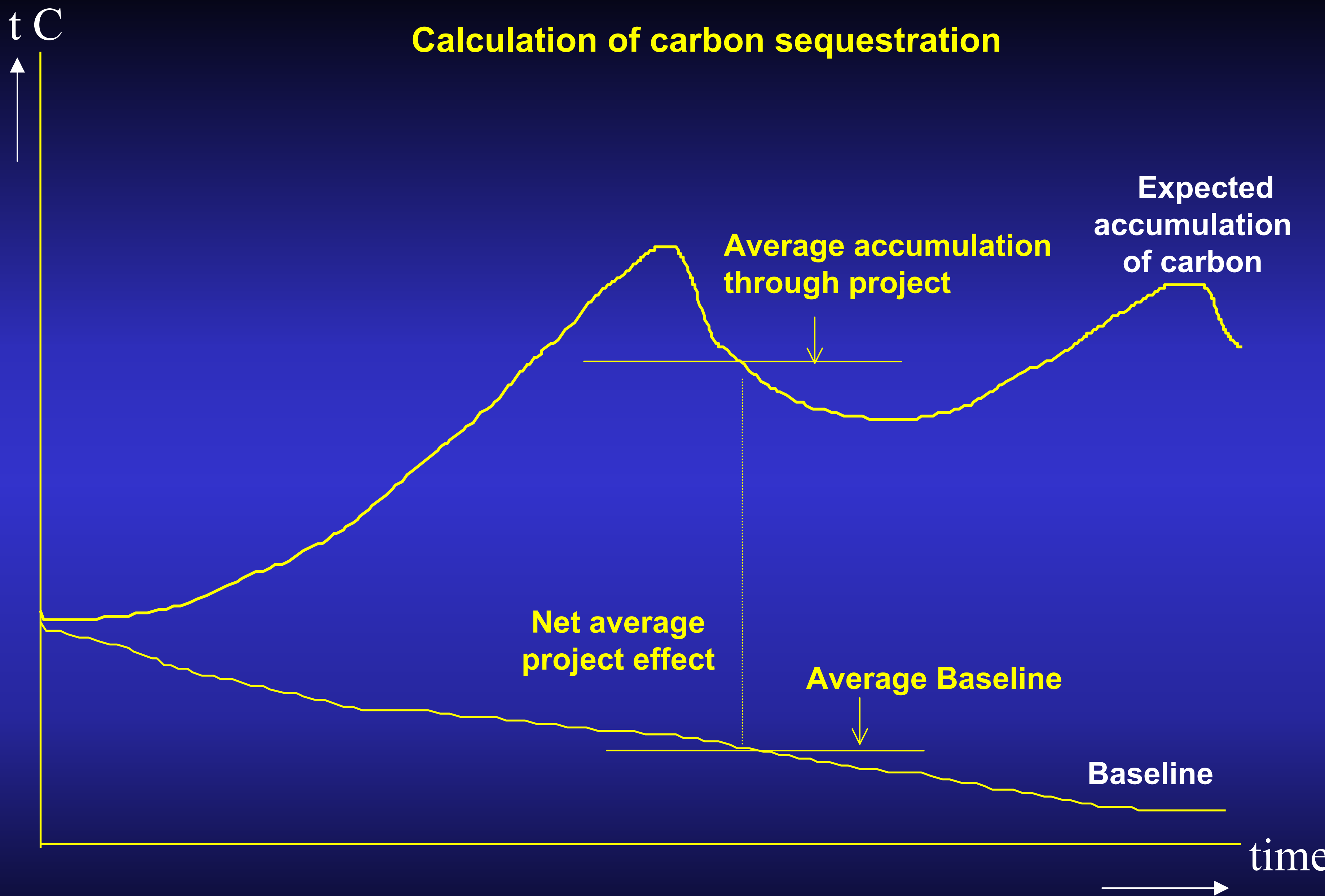


Highlands of Chiapas
608,000 ha

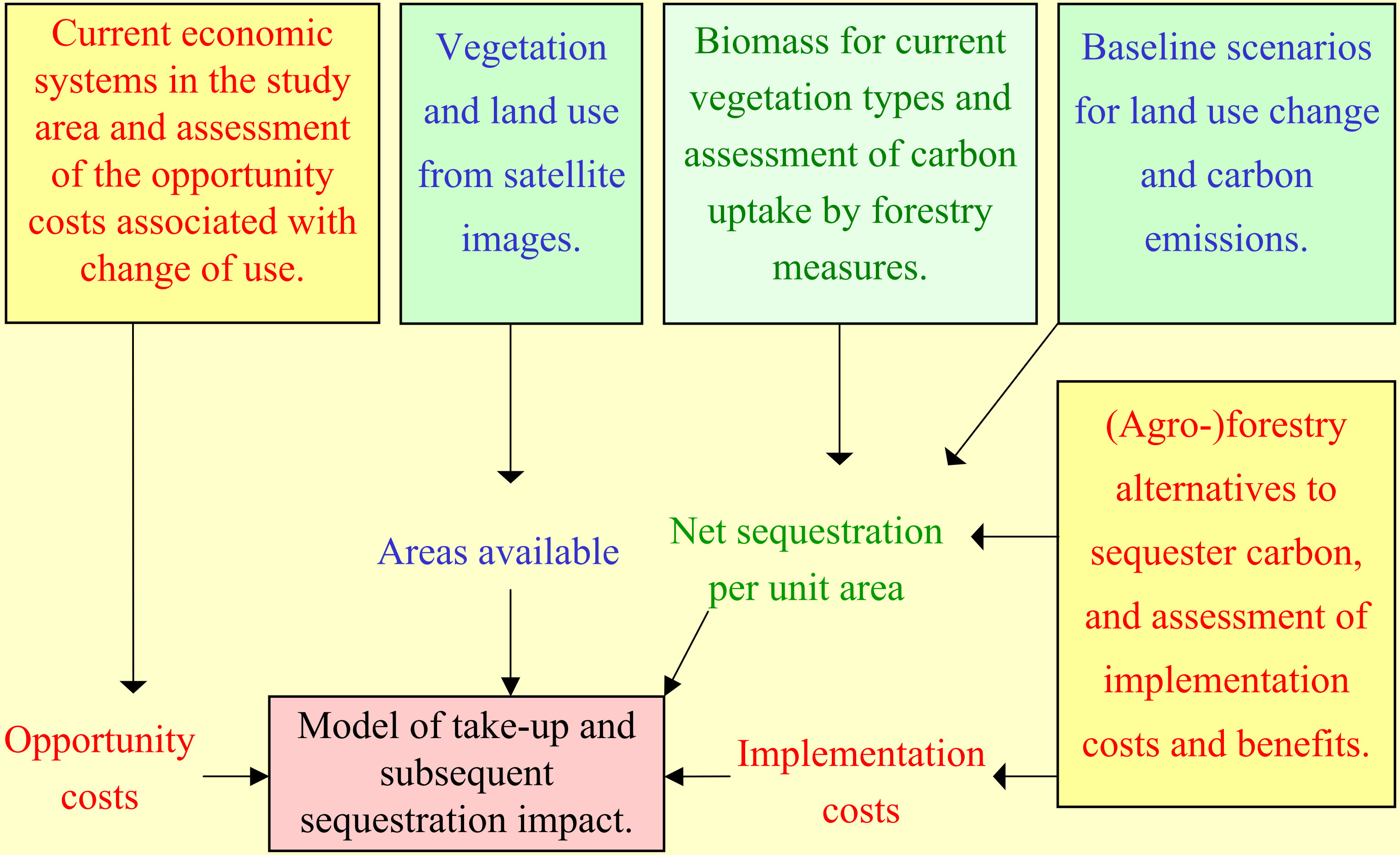
Legend

Legend	ALTITUD (m a.s.l..)	PRECIPITATION (mm)
(yellow)	*0 - 500*	*1,000 - 2,000*
(green)	*0 - 500*	*> 2,000*
(cyan)	*500 - 1,500*	*1,000 - 2,000*
(red)	*500 - 1,500*	*> 2,000*
(purple)	*> 1,500*	*1,000 - 2,000*

Calculation of carbon sequestration



Outline of the information flow to calculate the sequestration potential of an incentive/service payment-based forestry program (De Jong et al, 2000).



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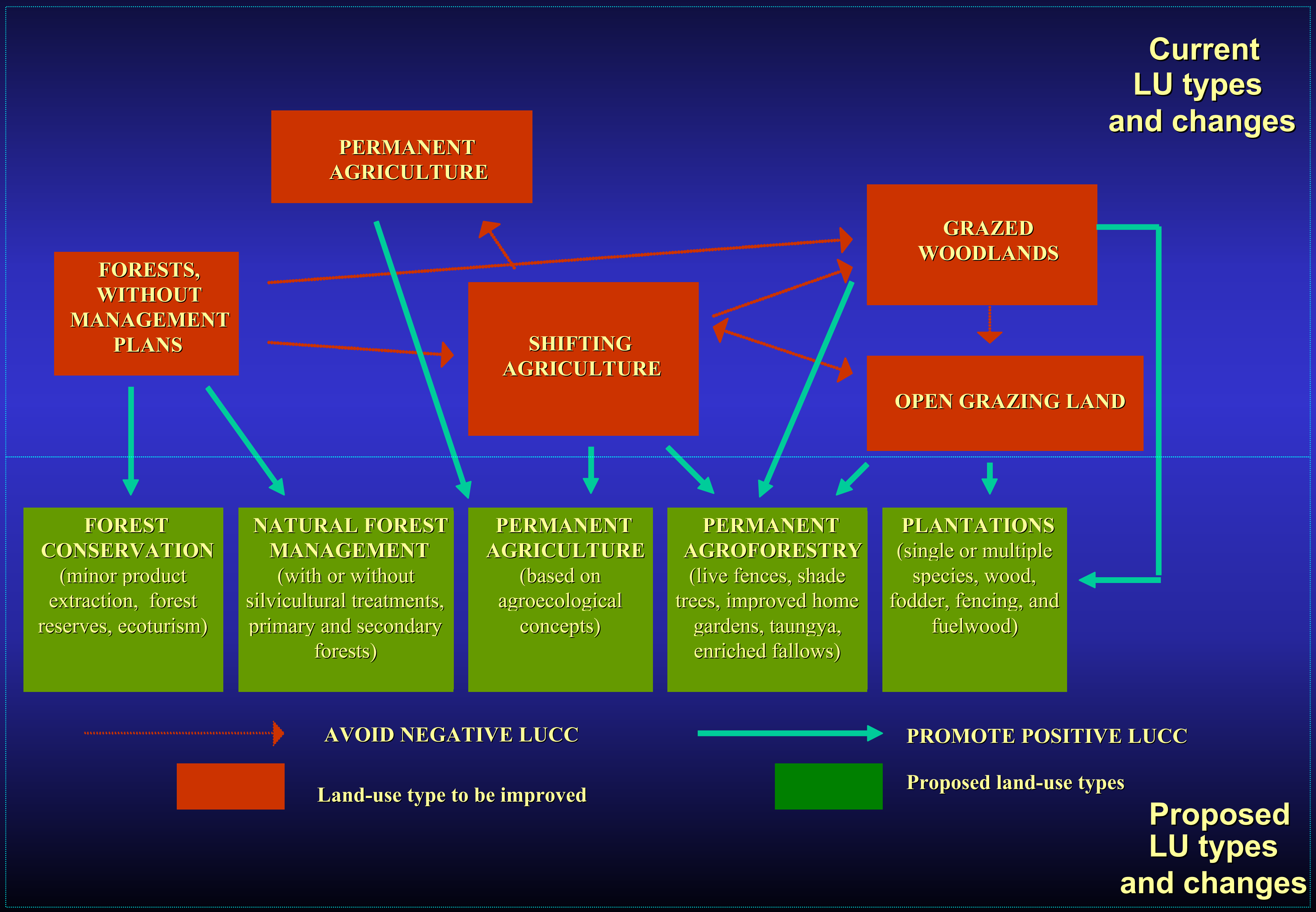
Current and proposed LU-change strategies



	Agriculture	Coffee	Open Pasture	Pasture with trees	Shrub fallow	Low tree fallow	High tree fallow
Live fences	1	1	1	1			
Dispersed trees	2		2	2			
Management of secondary vegetation					1	1	1
Improved fallow					2	2	2
Coffee with shade		2					
Taungya	3						
Plantation			3	3	3	3	

Current systems and proposed alternatives, according to intensity of intervention : 1 low 2 medium 3 high

Living fence

Low-intensity system

Enrichment planting

Medium-intensity system

Taungya High-intensity system

forest management alternatives

Degraded Forest:

Forest Restoration

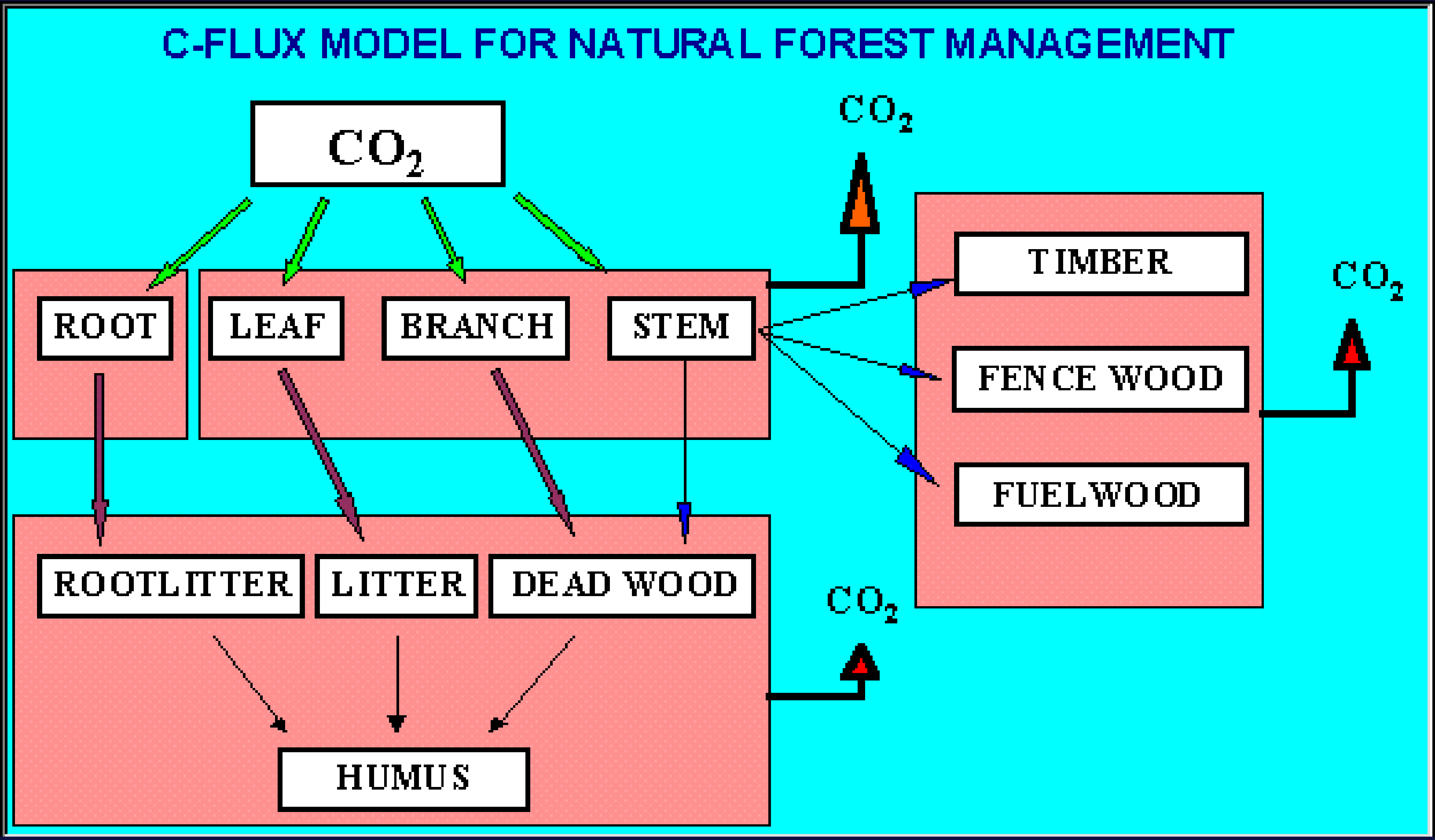
Healthy Forest:

Diversified Forest Mgmt

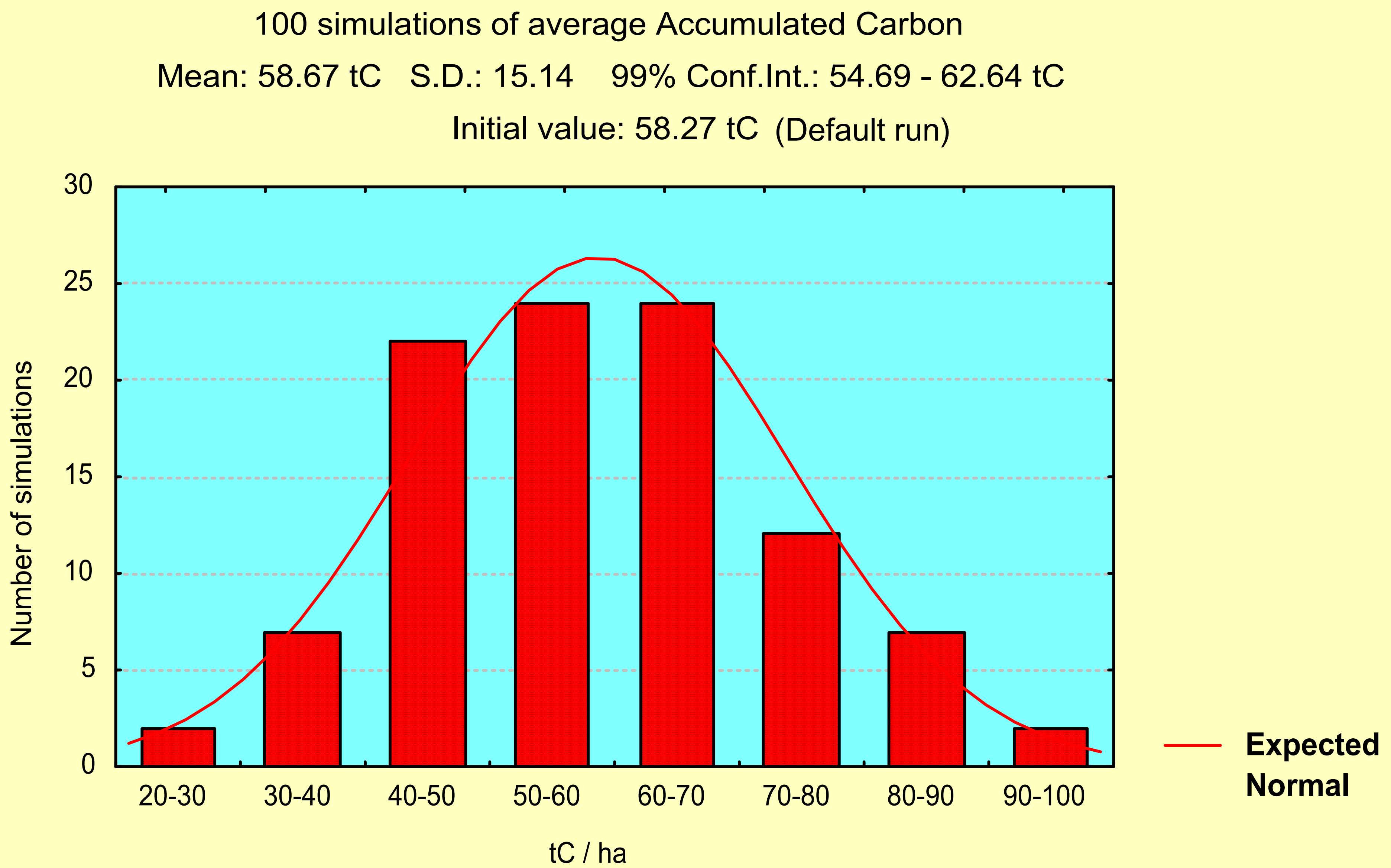
Cloud Forest:

Forest Conservation

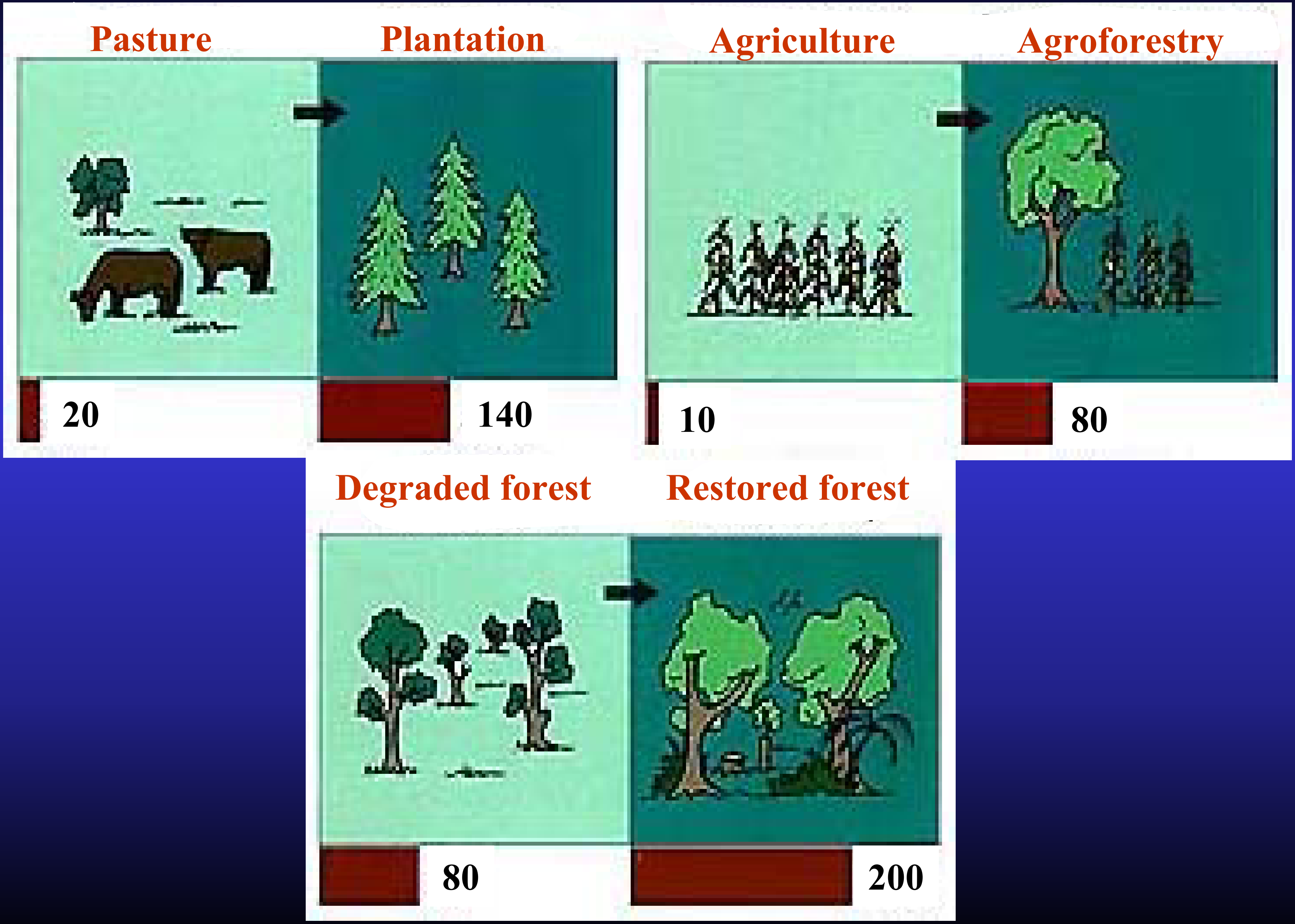
Estimating the C-dynamics of each option



For each current land-use system and alternative management option, 100 simulations were run, varying the input parameters with up 25% around the default value



How much carbon can be sequestered?



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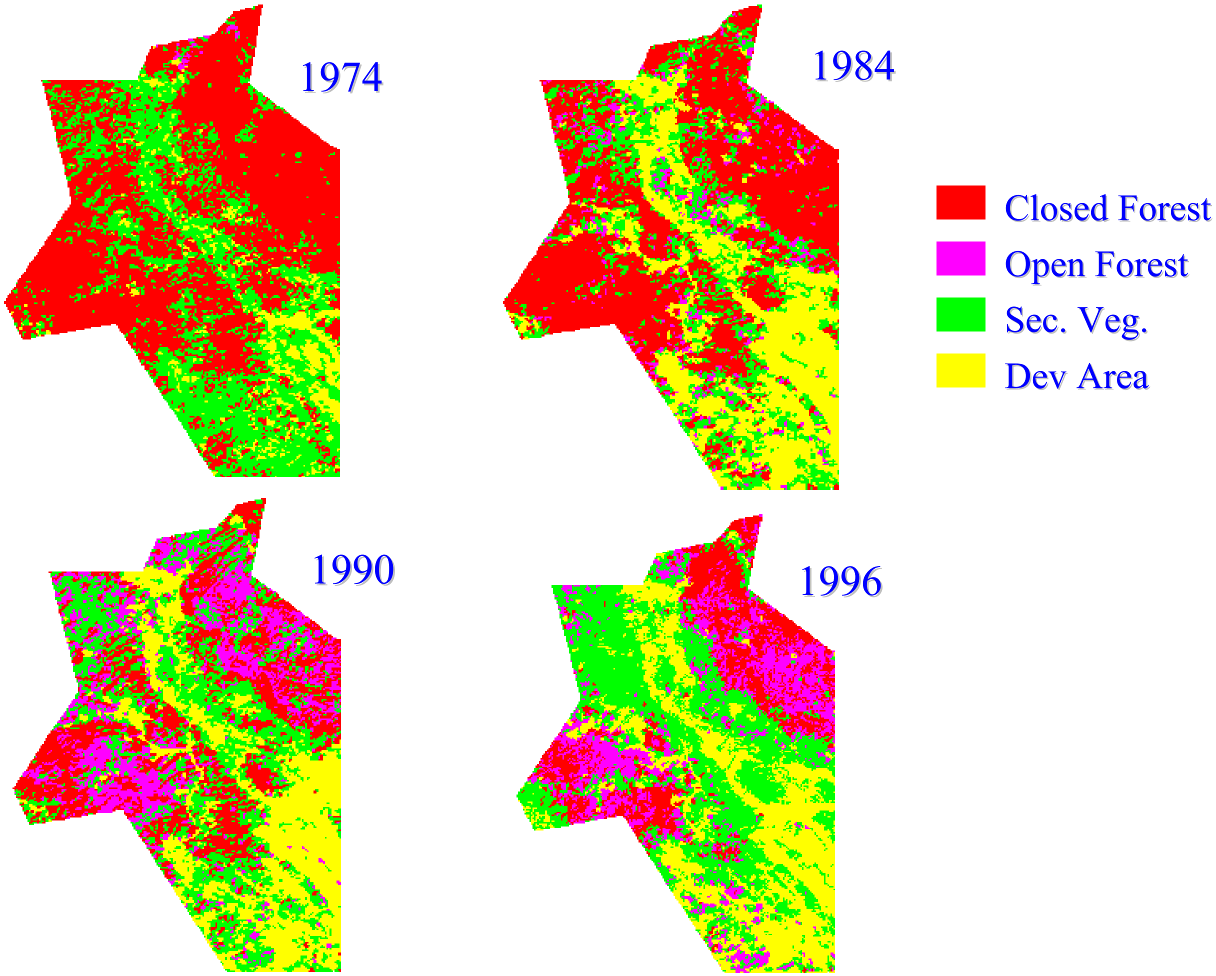
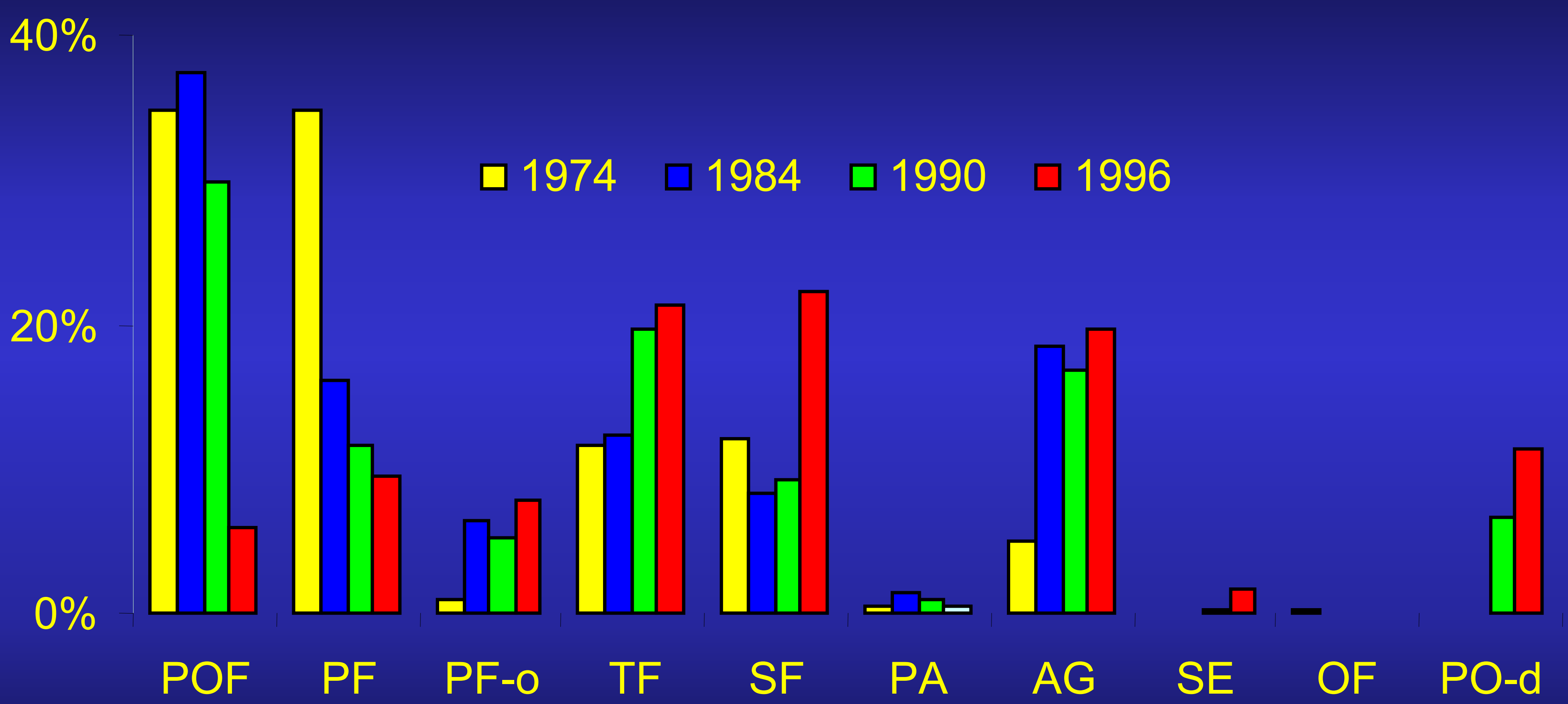
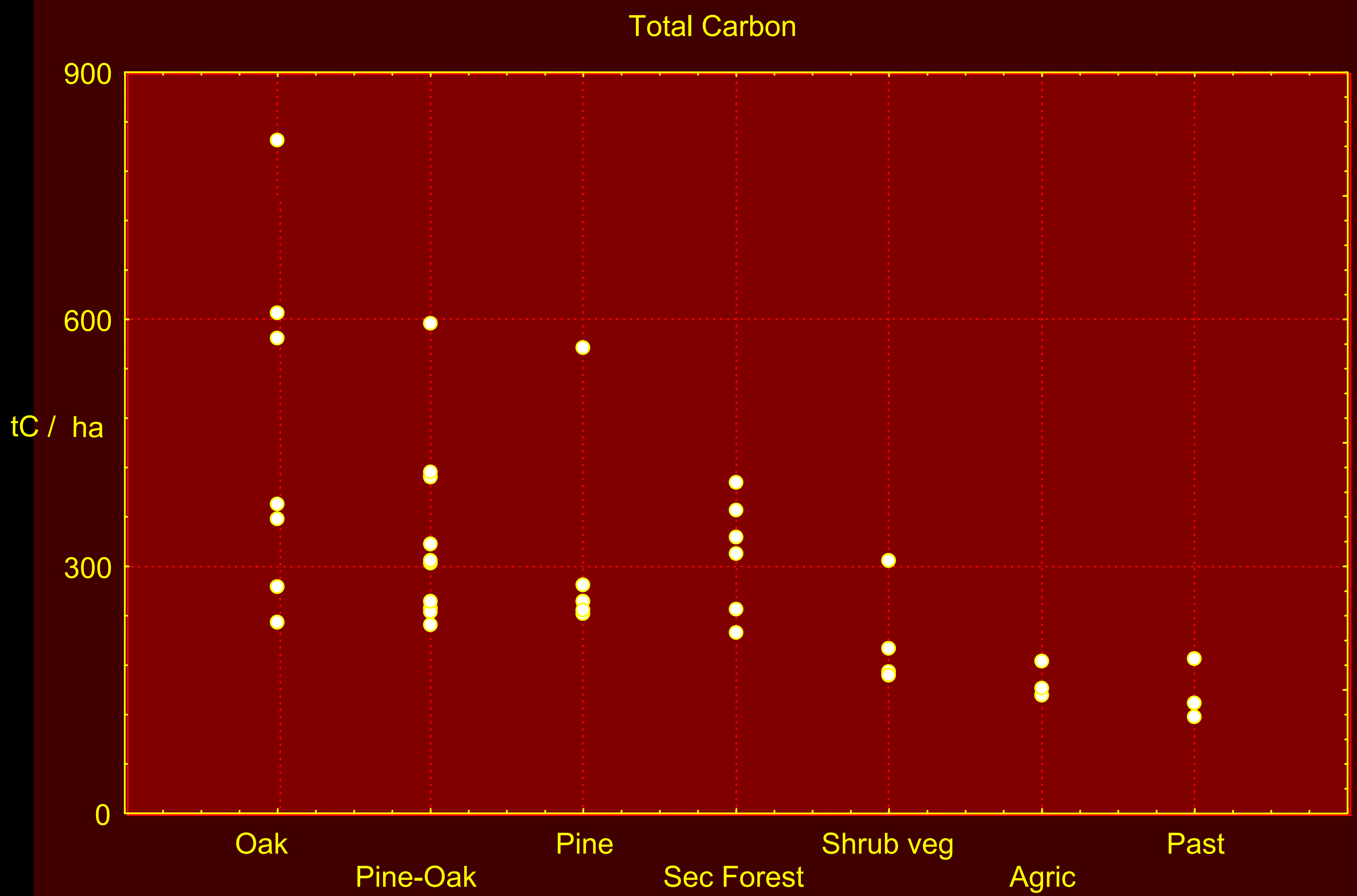
Historical trend in land-use change



Land use / cover as percentage of total area

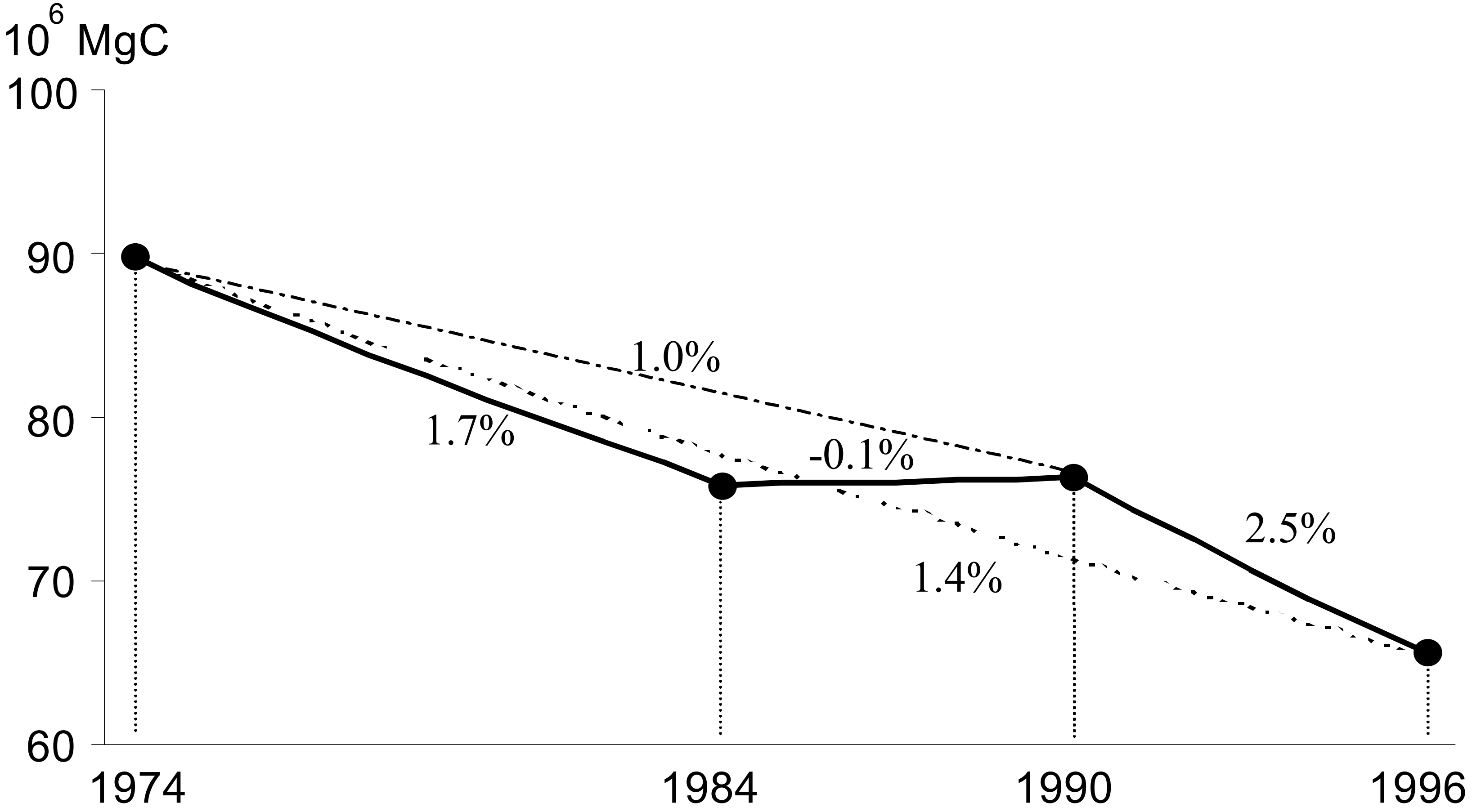


POF = Pine-Oak Forest; PF = Pine Forest; PF-o = Open Pine Forest; TF = Tree Fallow; SF = Shrub Fallow
PA = Pasture; AG = Agriculture; SE = Settlements; OF = Oak Forest; PO-d= Disturbed Pine-Oak Forest



Total Carbon
900
600
300
0
tC / ha
Oak
Pine-Oak
Pine
Sec Forest
Shrub veg
Agric
Past

Historical carbon depletion (in 10^6 MgC and % annual change) in an area of 306,000 ha, based upon data from Landsat images of 1974, 1984, 1990, and 1996, and field collected carbon density data (De Jong et al, 2000).



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Costs of the management options.

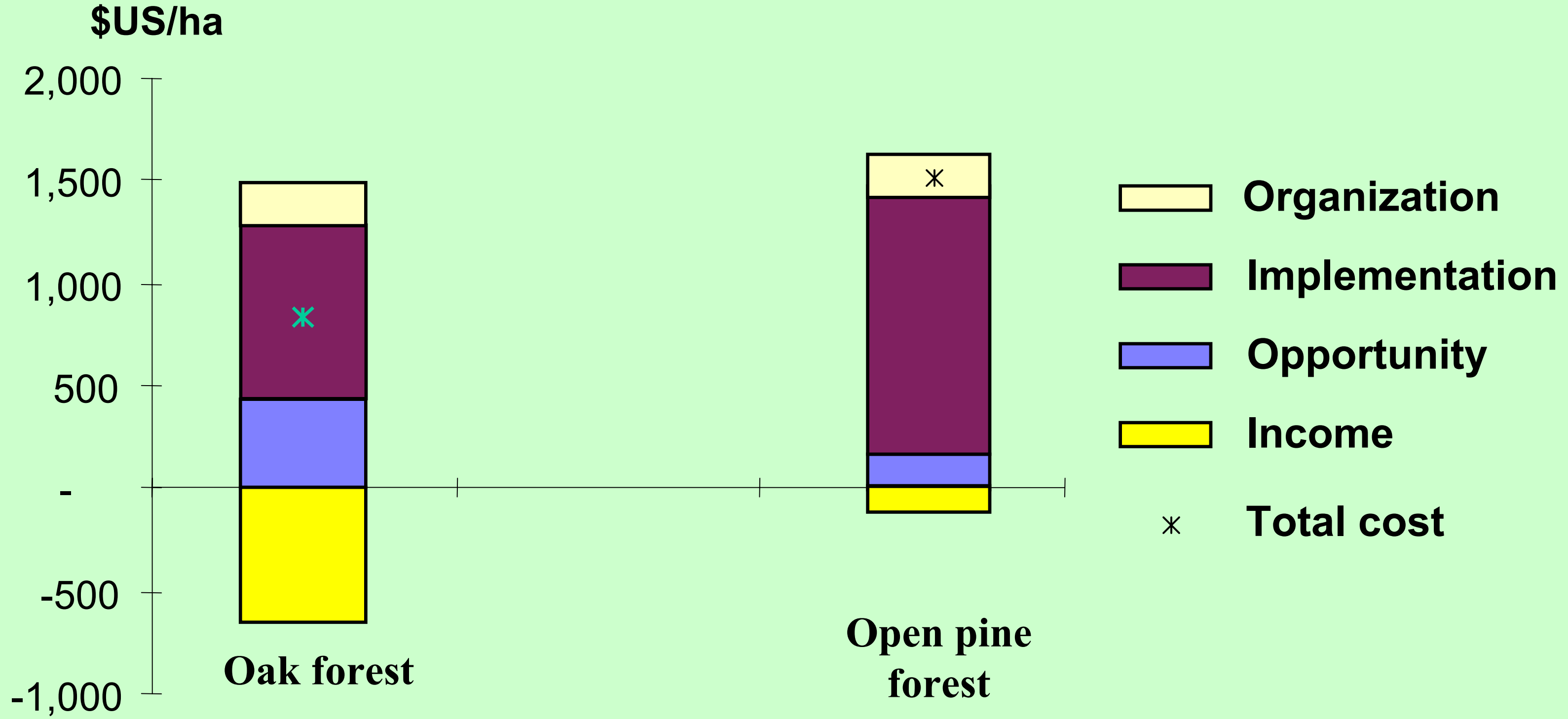
Land use / Land Cover Types	Establishment including labor costs (US$)	Operational and maintenance including project monitoring (US$ ha^{-1} yr^{-1})
Closed Forest	186 - 209	63 - 101
Open Forest	217.5	101
Tree and shrub Fallow	223 - 285	75- 103
Milpa Agriculture	212	36 - 49
Pasture	282.5	39 - 65

Annual opportunity costs (in US$ yr^{-1}) to convert current land use practices into C-sequestration management alternatives (in US$).

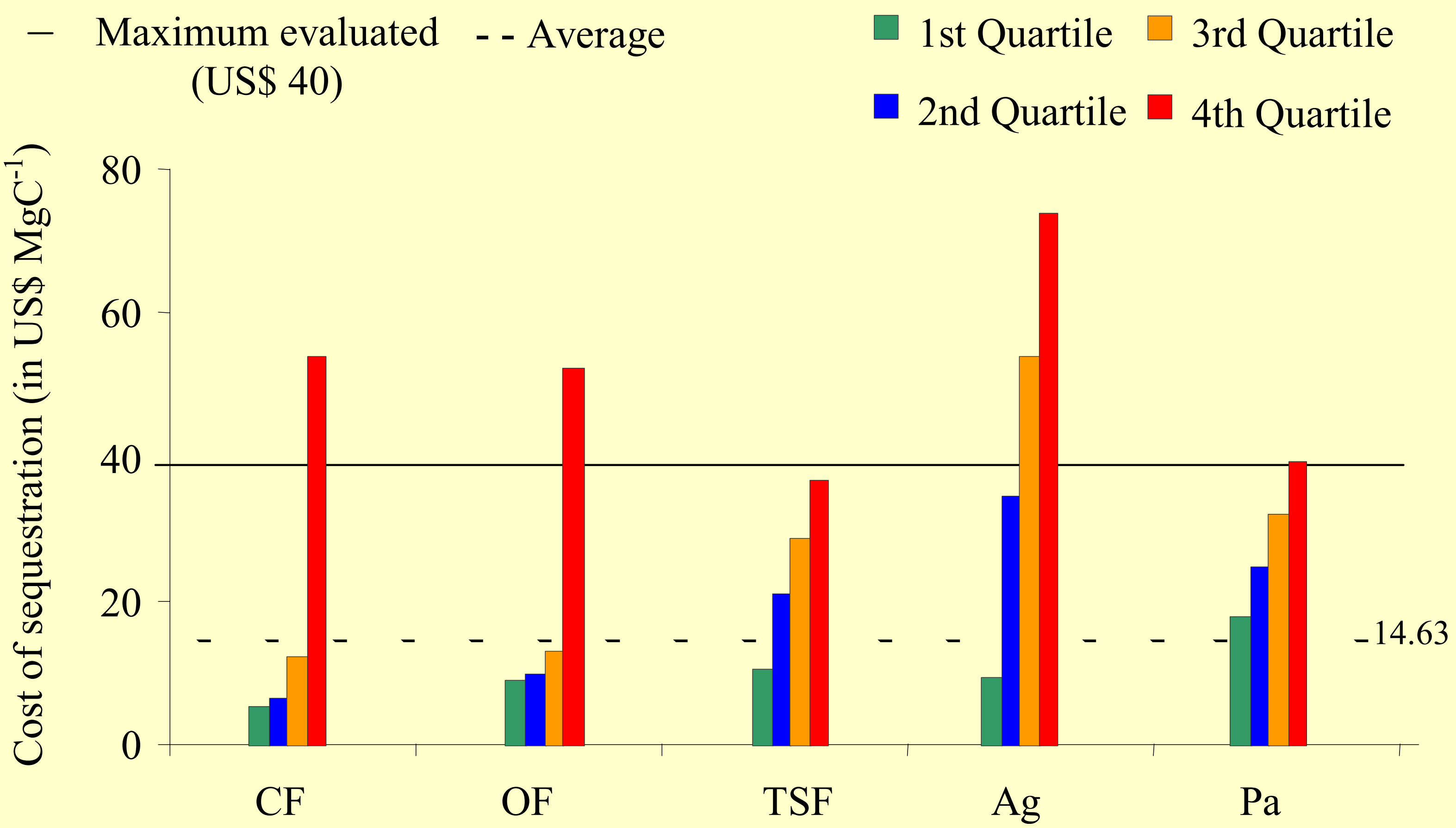
Production System	Opportunity Costs (US$ yr^{-1})			
	1st Quartile	2nd Quartile	3rd Quartile	4th Quartile
Closed forest	0 - 7	7 - 13	26 - 65	65 - 130
Open forest	0	6.5	26	65
Tree and Shrub Fallow	0	86	150	215
Milpa Agriculture	0	140	250	359
Pasture	39	78	107	152

Carbon sequestration costs for two types of forest

(Tipper *et al*, 1998)



Costs of Carbon sequestration in US$ MgC^{-1} for the four quartiles of the (agro-) forestry options, that would replace current land use: CF = Closed forest; OF = Open forest; TSF = Tree and shrub fallow; Ag = Agriculture; Pa = Pasture (De Jong et al, 2000).



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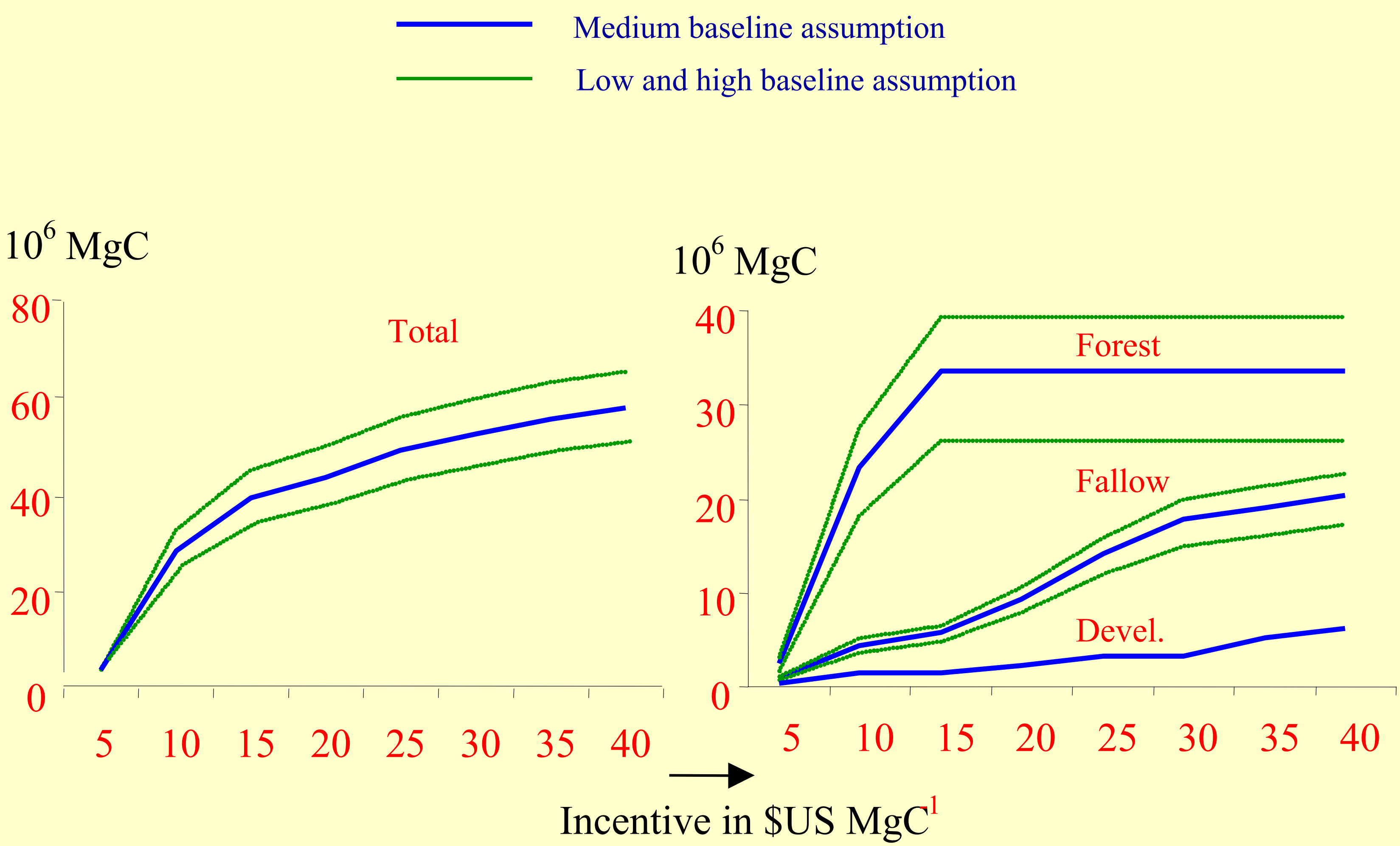

Predicted carbon sequestration supply curves, separated for total (Total), closed and open forest (Forest), tree and shrub fallow (Fallow) and Agriculture + Pasture (Devel.) management options, based on low, medium and high baseline assumptions (From De Jong et al, 2000).