

# DEFINING SUSTAINABLE FOREST MANAGEMENT IN THE TROPICS

## A Disaggregated Landscape-Level Approach

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# Sustainable Development

as defined in “Our Common Future”  
(Brundtland Report, 1987)

“...**development** that meets the needs of the present without compromising the ability of future generations to meet their own needs.”

## **Natural capital**

natural resource stocks (soil, water, air, genetic resources etc.) and environmental services (hydrological cycle, pollution sinks etc)

## **Social capital**

social resources (networks, social claims, social relations, affiliations, associations)

## **Human capital**

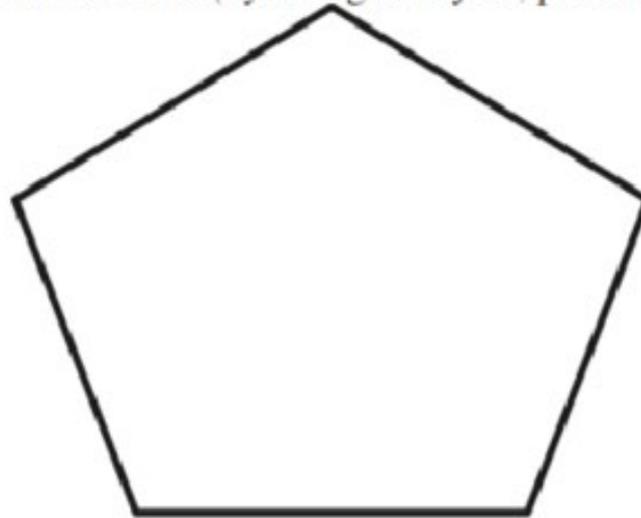
skills, knowledge, labour (includes good health and physical capability)

## **Physical capital**

Infrastructure (buildings, roads), production equipment and technologies)

## **Economic or financial capital**

capital base (cash, credit/debt, savings, and other economic assets)



**“Strong” sustainability requires non-diminishing yields of renewable resources.  
“Weak” sustainability requires non-diminishing sums of the 5 capitals.**

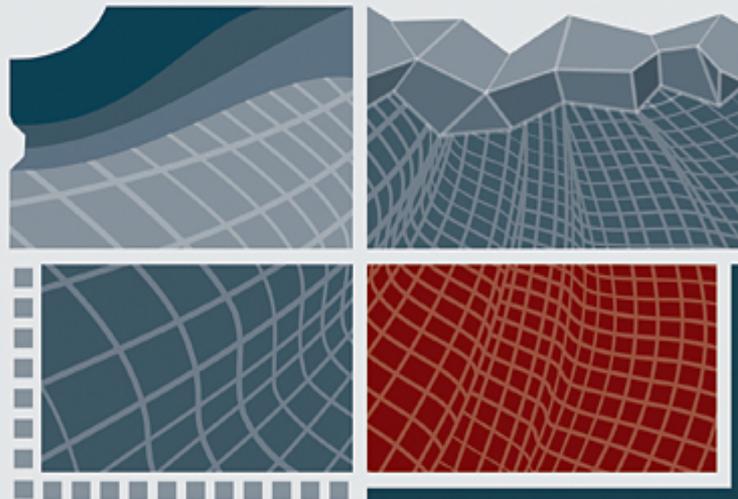
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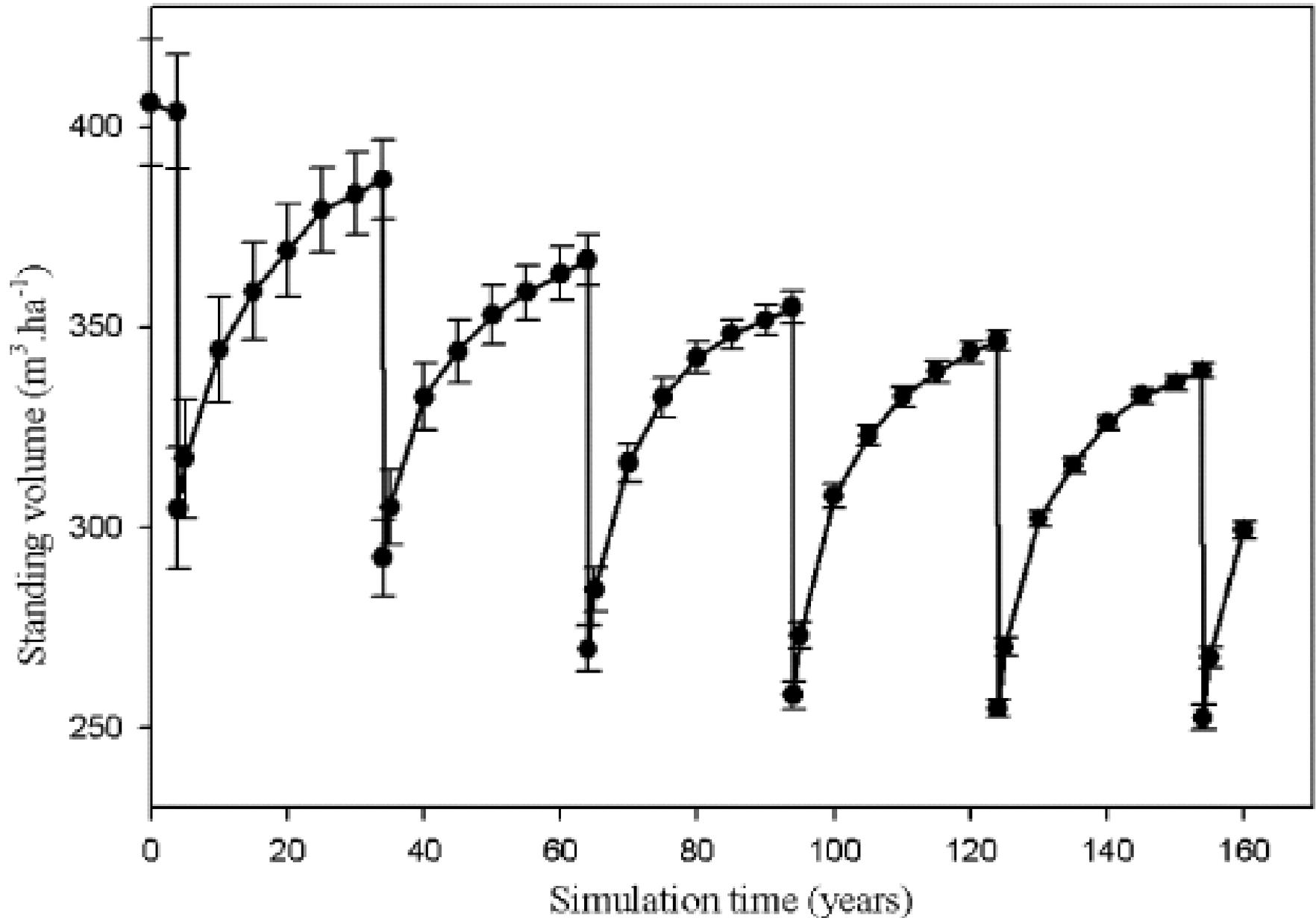


“[SFM is] the process of managing forest to achieve one or more clearly specified objectives of management with regard to the production of a continuous flow of desired forest products and services without undue reduction of its inherent values and future productivity and without undue undesirable effects on the physical and social environment” (ITTO 2016).

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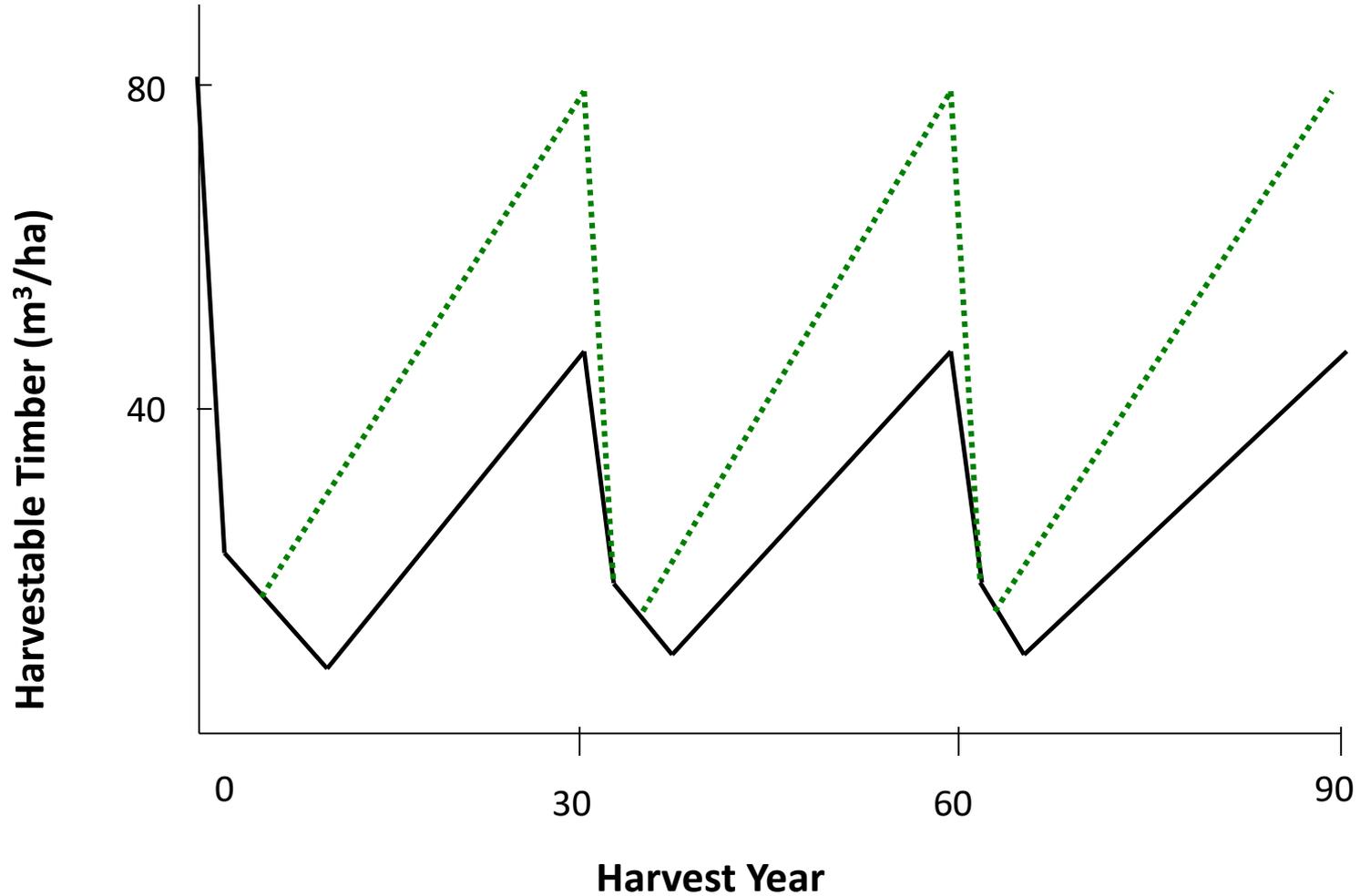


# Timber yields decline after each (selective) harvest

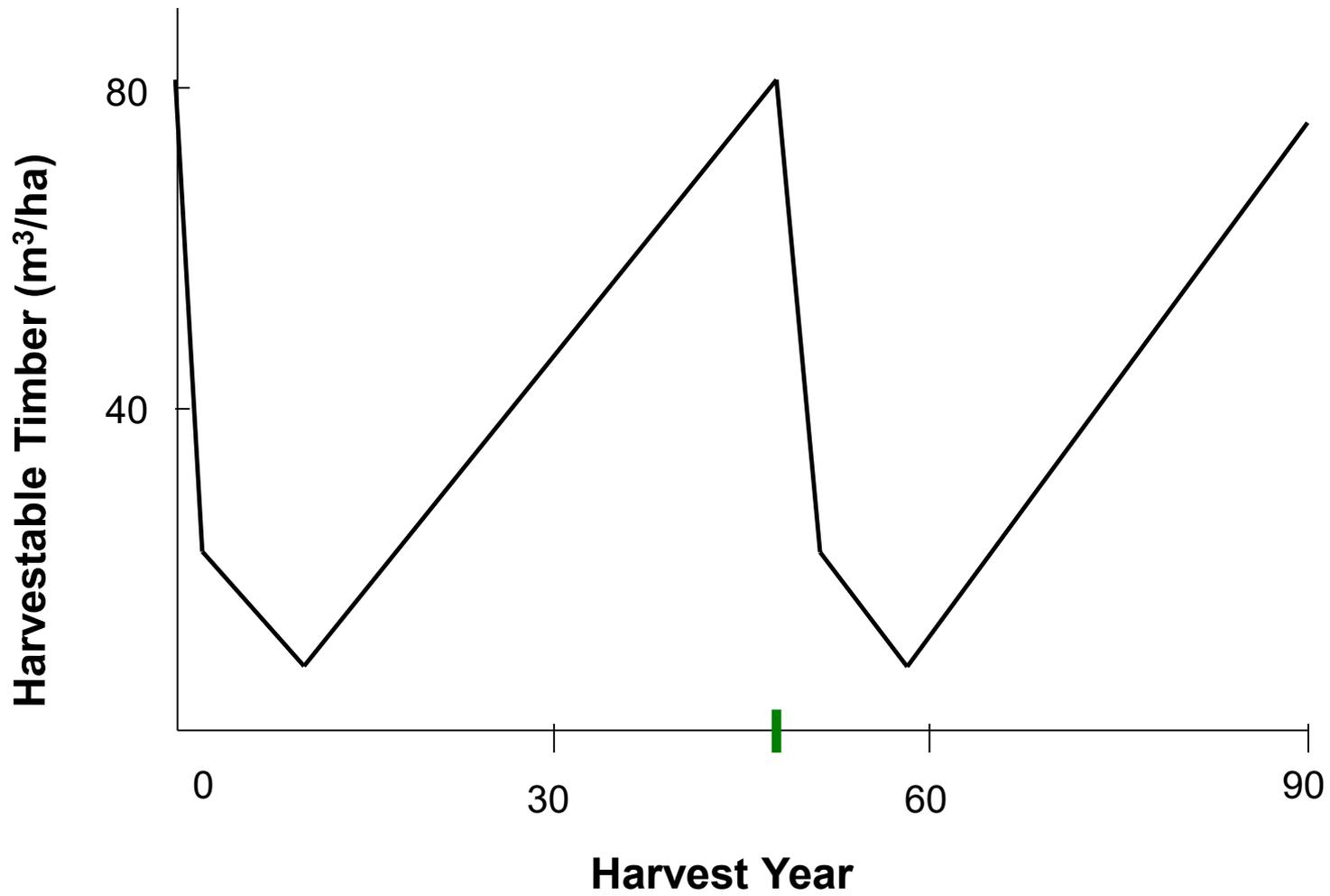


# GOAL: Sustain Timber Yields

*(we all know what that means, right?)*









# Responsible Stewardship of the World's Forests

**Voluntary third-party forest certification: expected  
“green premiums” and better market-access  
as rewards for responsible management.**



# SUSTAINED YIELD

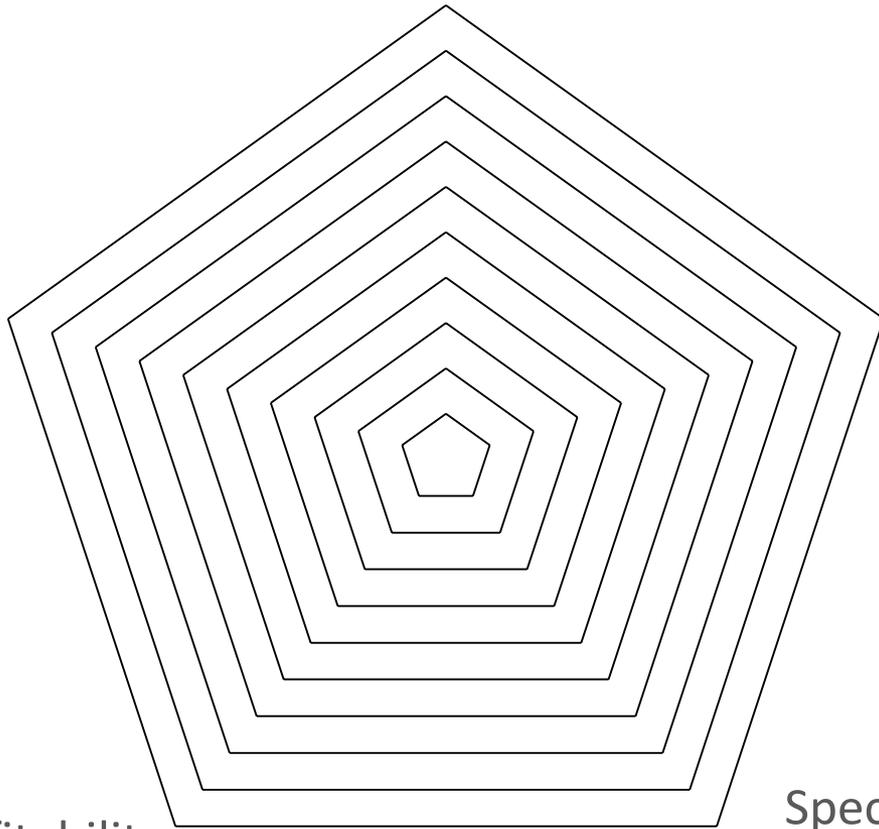
Volume

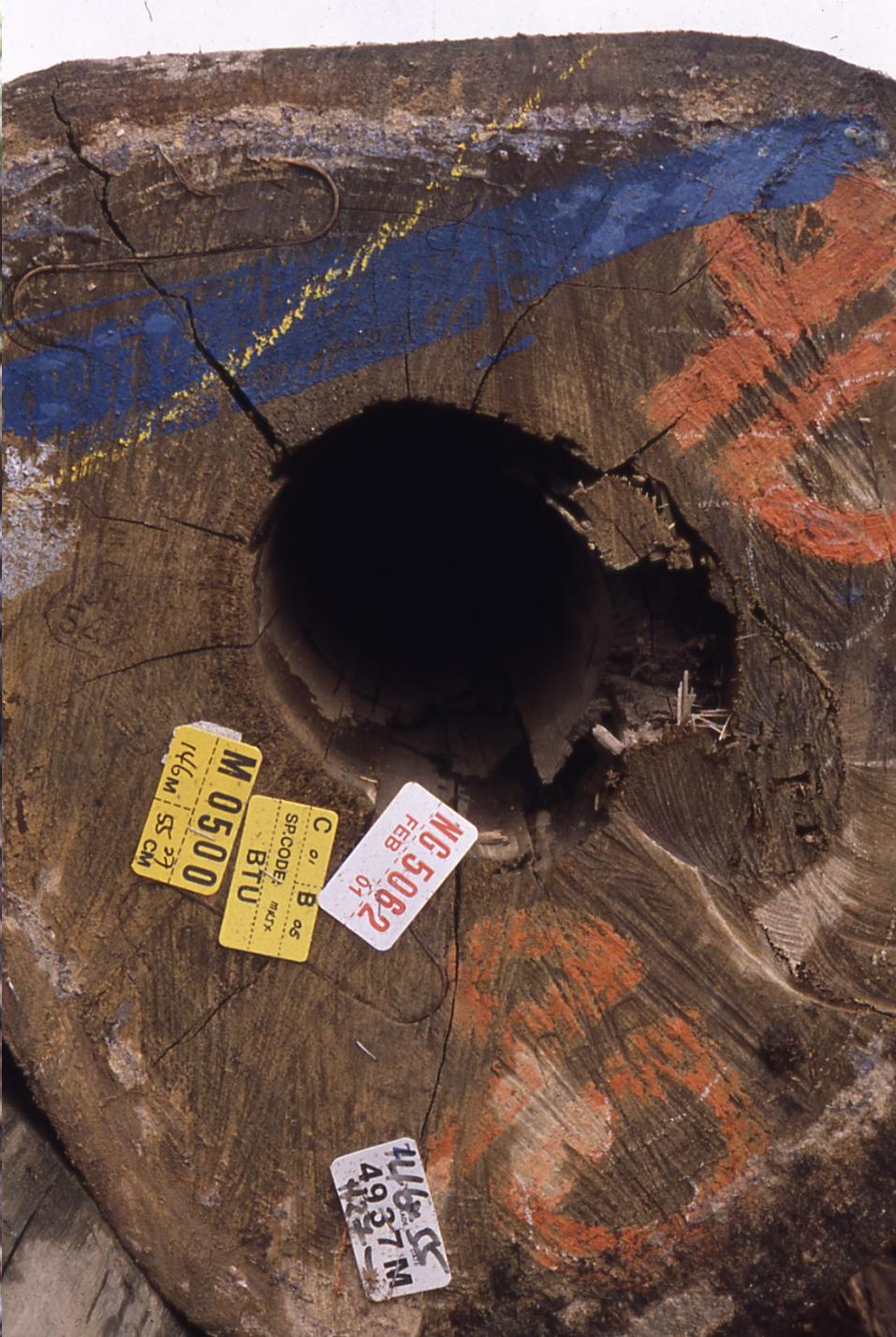
Quality

Species  
Composition

Profitability

Size distribution





# SUSTAINED YIELD

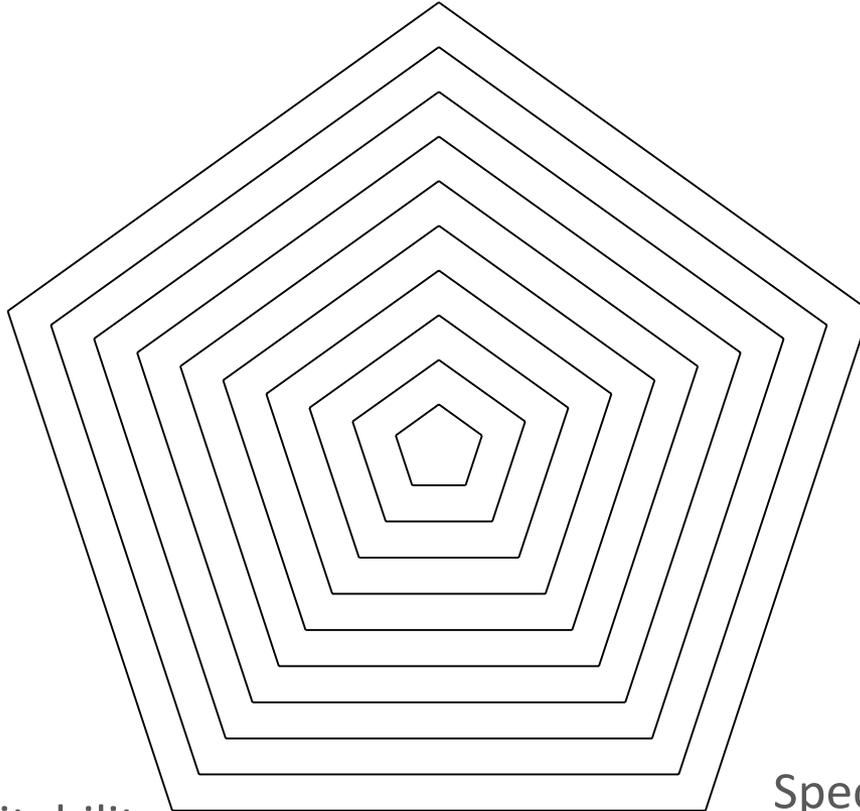
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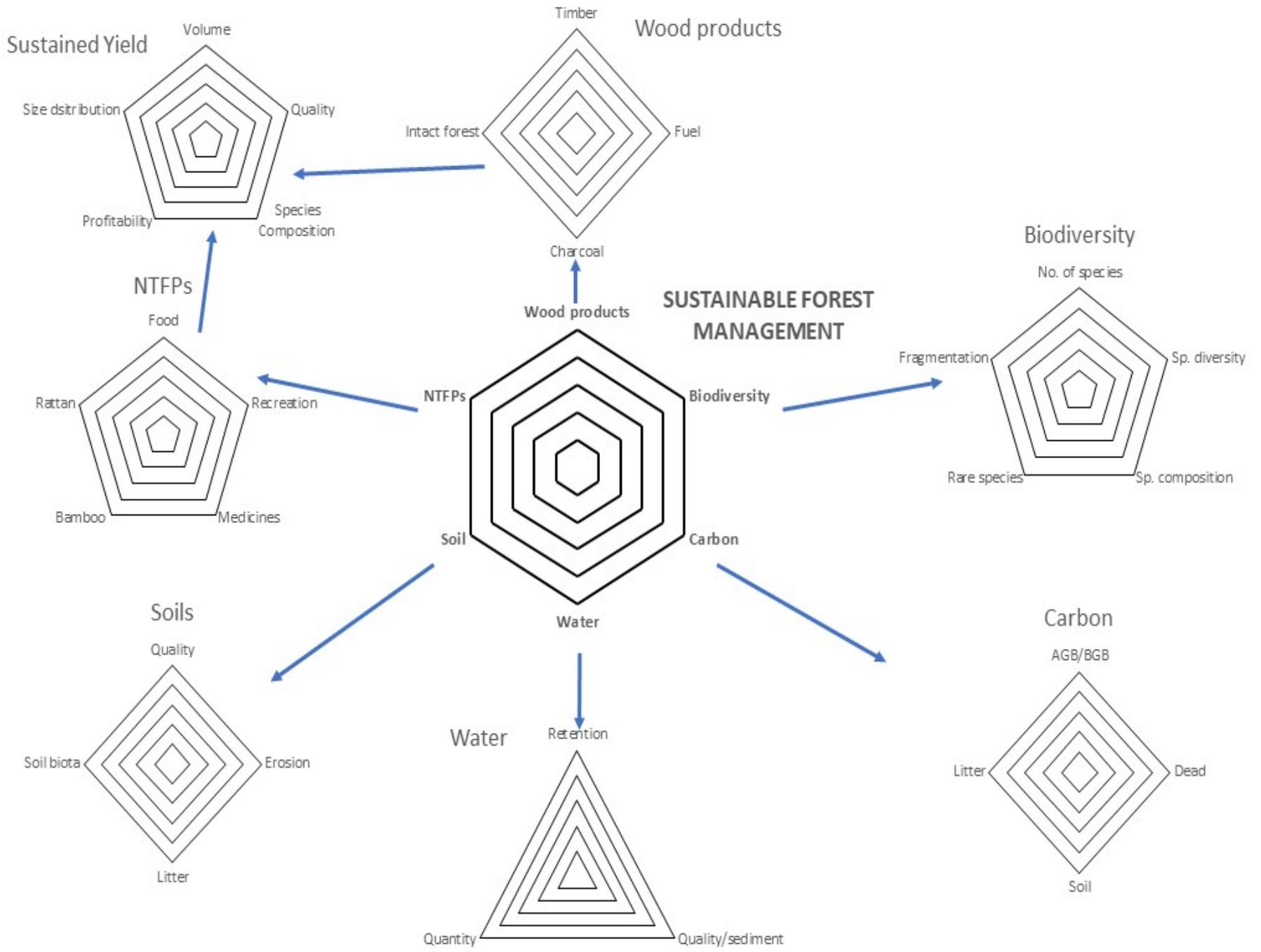
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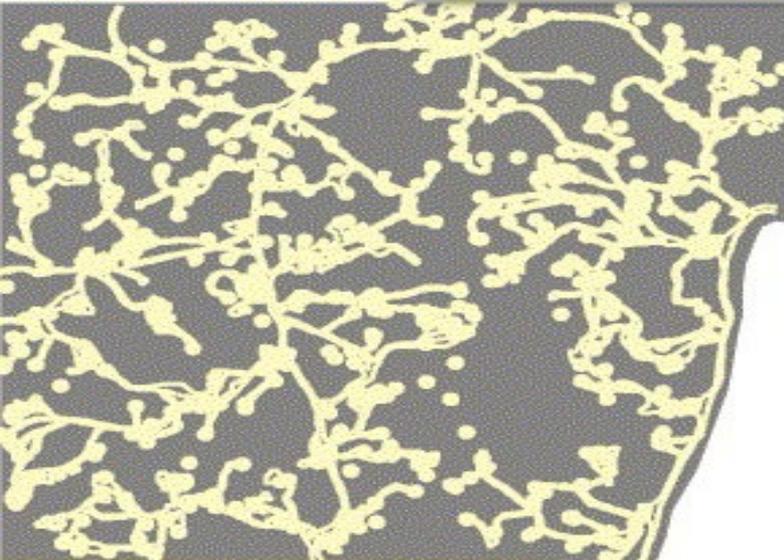
Size distribution



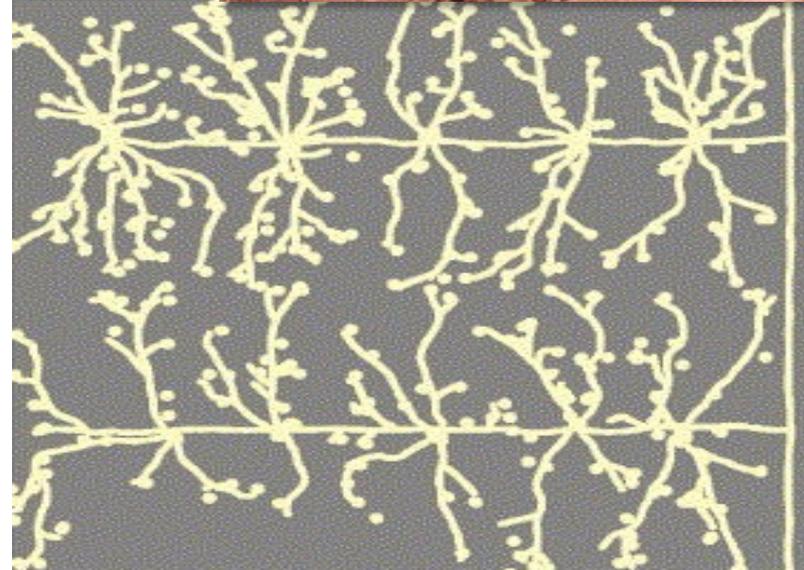




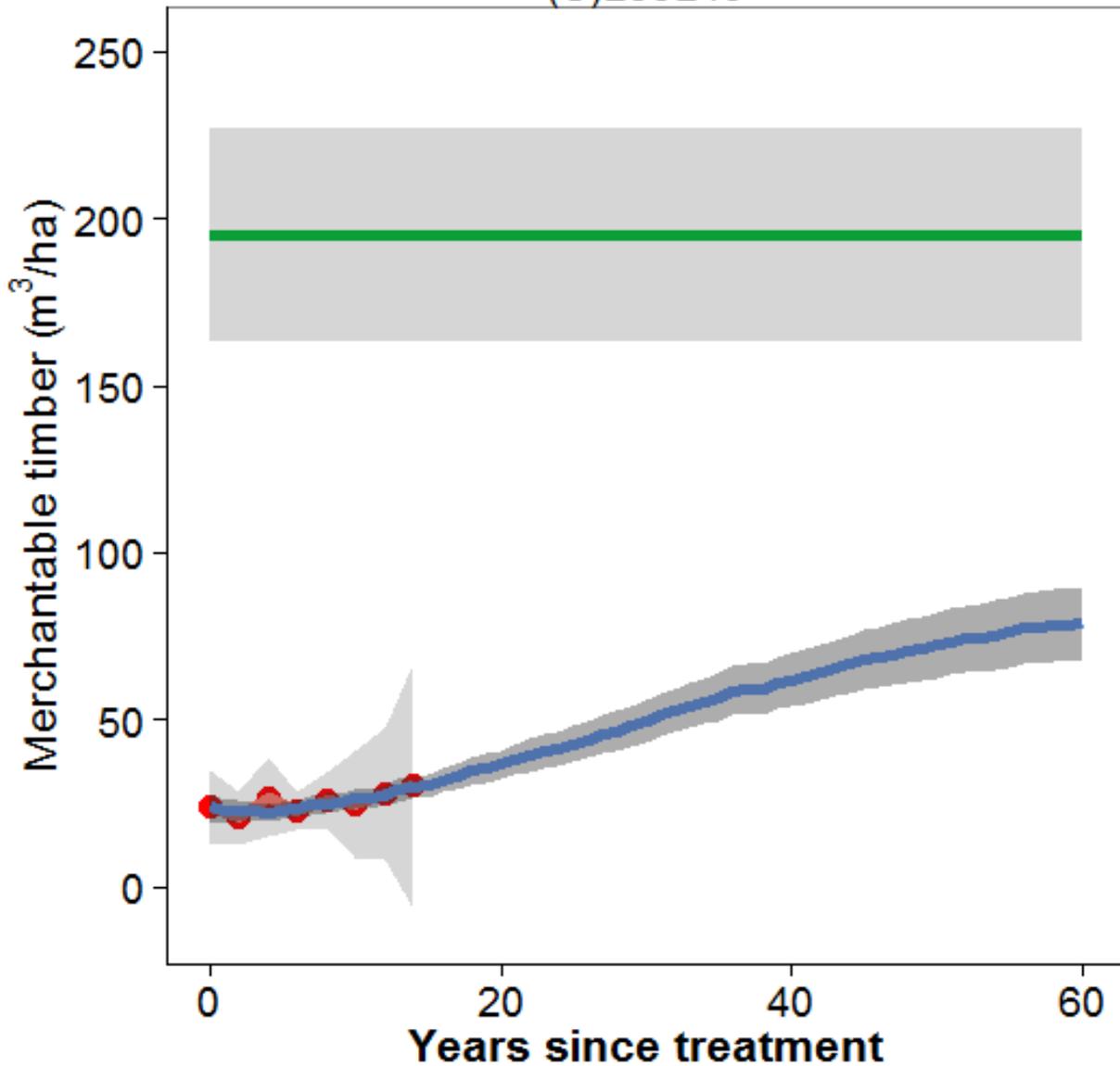
# Conventional Logging



# Reduced-Impact Logging



(C)L60L40



But even with RIL timber yields are not sustained.

After second round of RIL in Kalimantan

Dr. Ruslandi



# Liana Cutting: A Treatment that Works

Liberating Mahogany  
Future Crop Trees in Belize

Liberating one FCT = **\$0.11**

Value gain from one liberated mahogany: **\$695**

Other benefits: better boles,  
less logging damage,  
enhanced regeneration

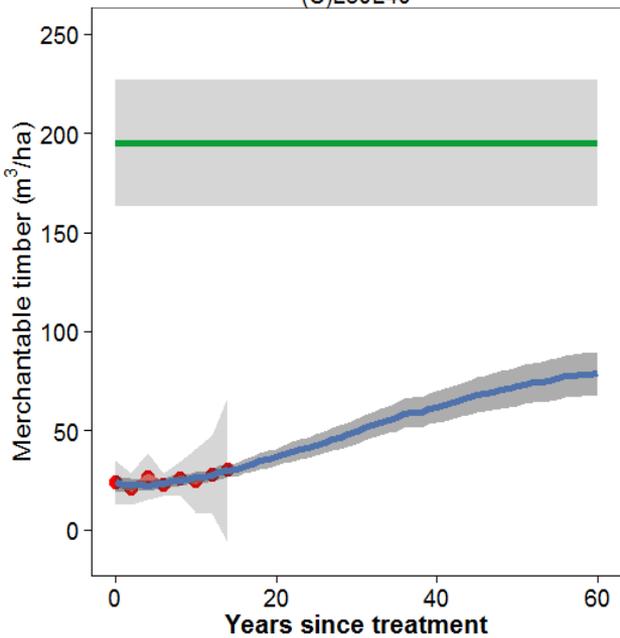


# Silvicultural Intensification

## Enrichment Planting: The Not-So Gentle Approach

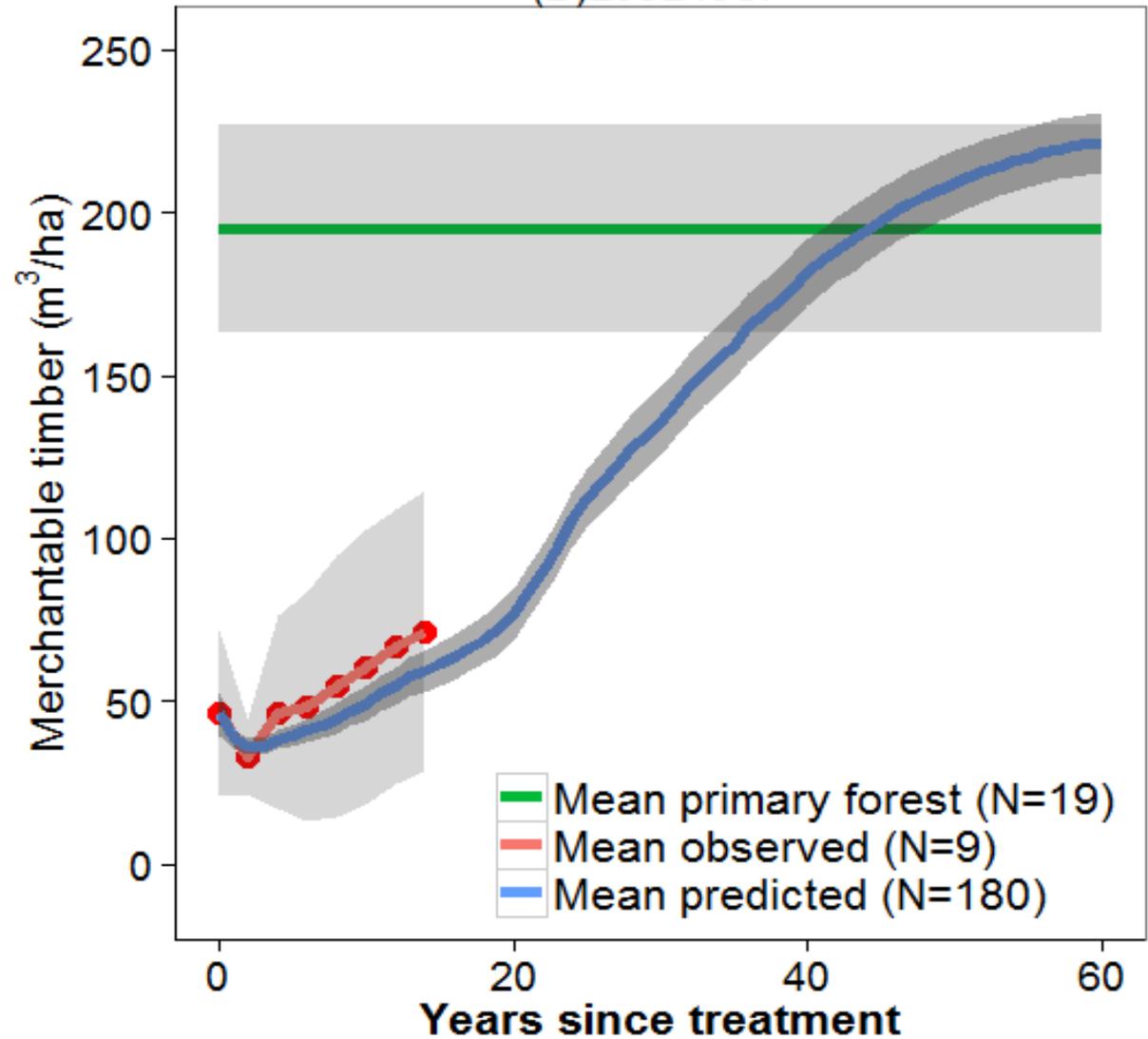


(C)L60L40



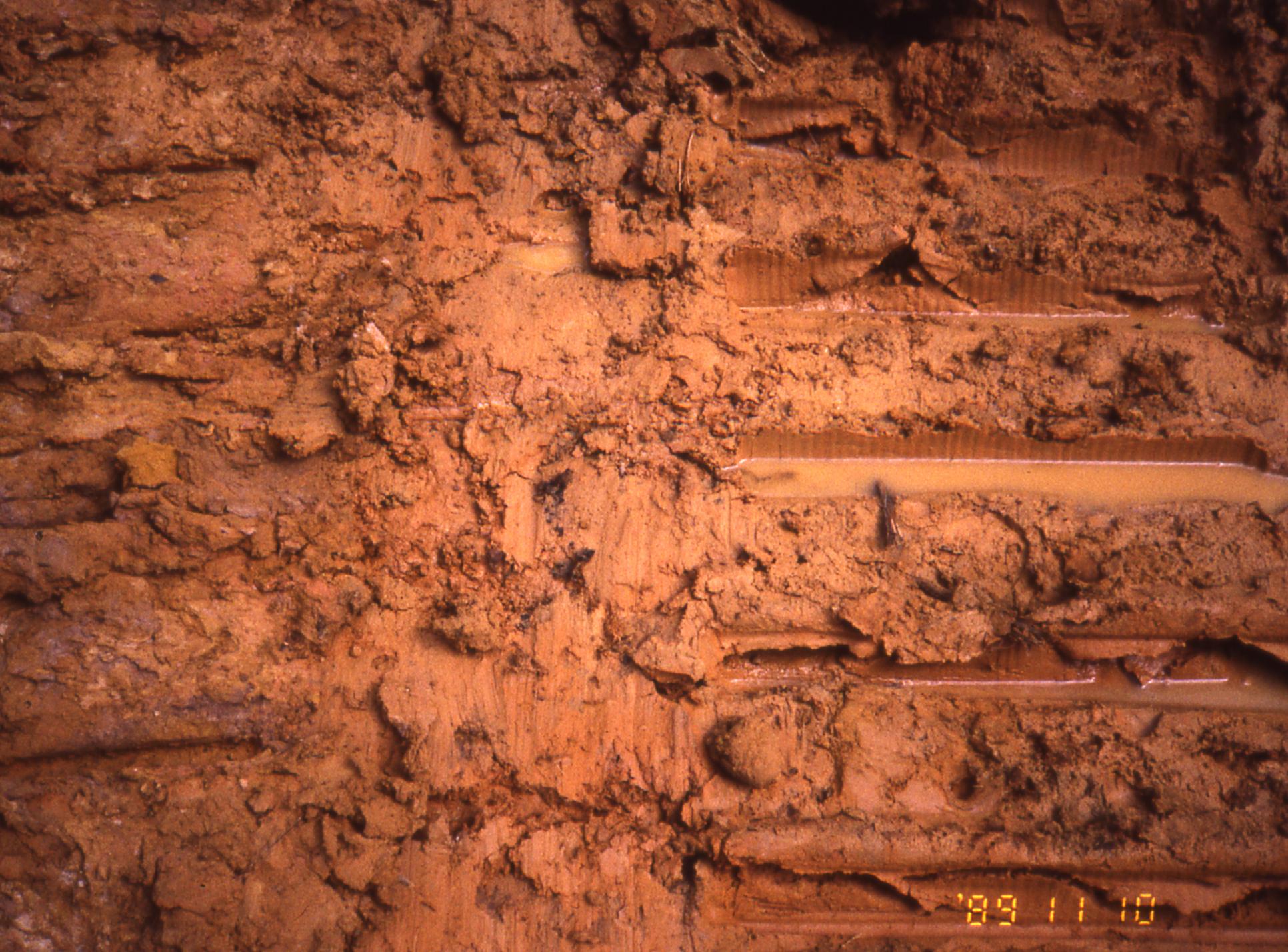
After 2 rounds of RIL

(D)L60L40SP



After Enrichment Planting





89 11 10



# NPV<sub>(30 yr)</sub> with 10% DR (=the grim reality)

**Timber Stand Management:** US\$200-400/ha

**Cattle ranching:** US\$300-600/ha

**Industrial soybeans:** US\$2000-4000/ha

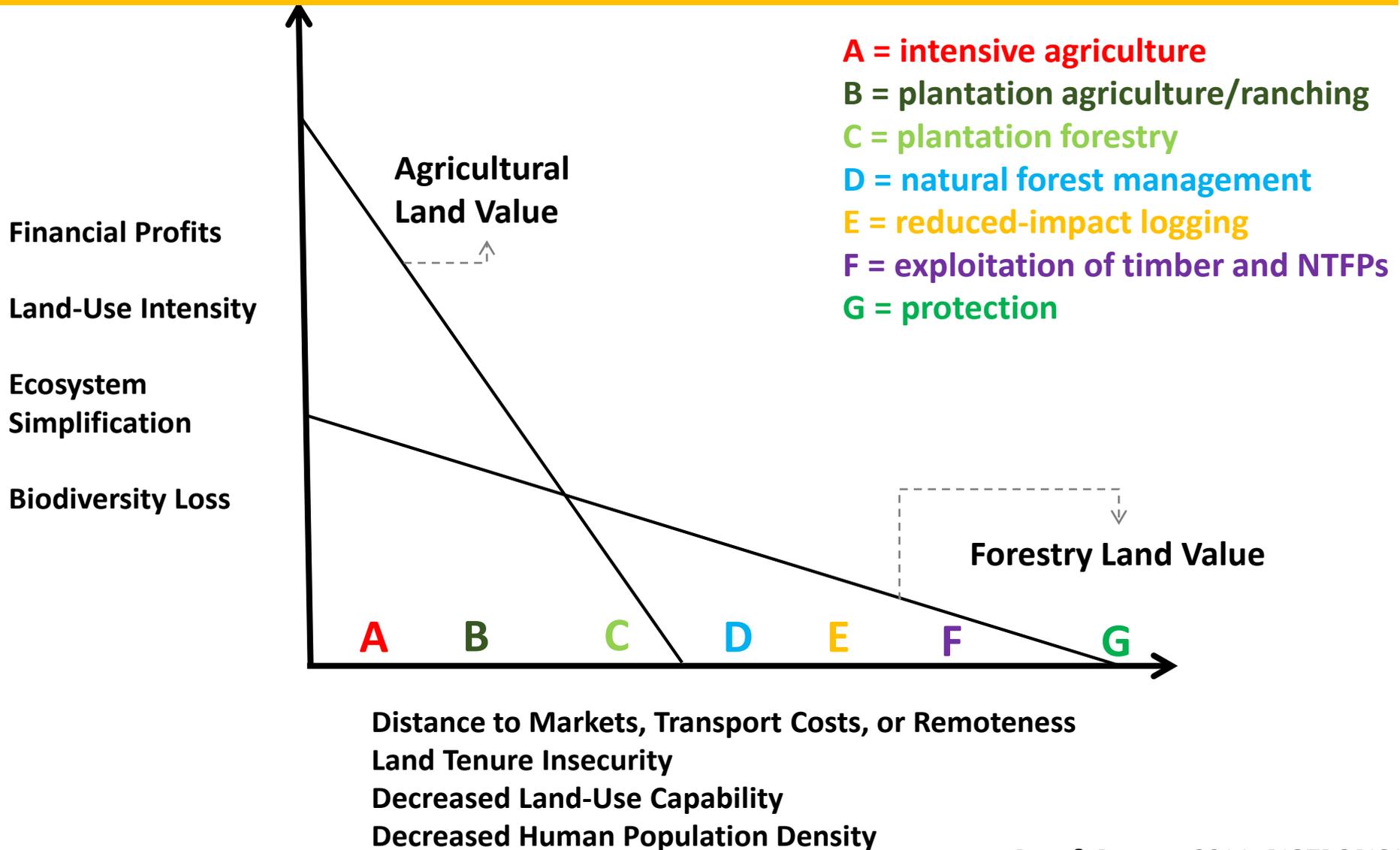
**Oil palm plantation:** US\$4000-10000/ha

**Mining:** (don't even want to consider)

**BUT:** 20% of tropical forests under the control of people whose main utility might not be short-term financial profit maximization

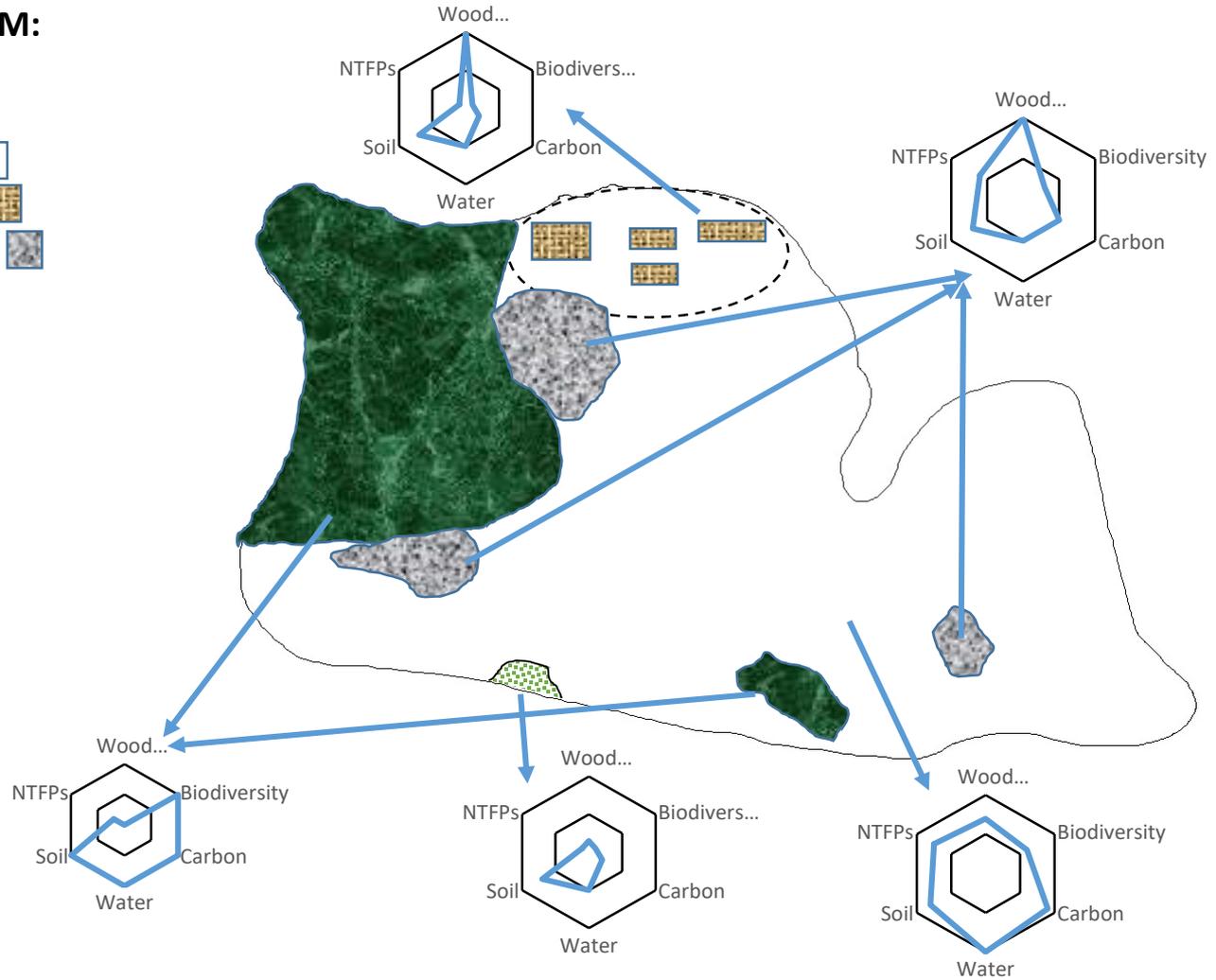
# Von Thünen Model for Land Use

## Where forestry stands a chance.



## Division of forest landscape for SFM:

1. Protected areas 
2. Extensive forest management 
3. Plantation forest management 
4. Community forest management 
5. Forest restoration 





Environment (non-human)

3

2.5

2

1.5

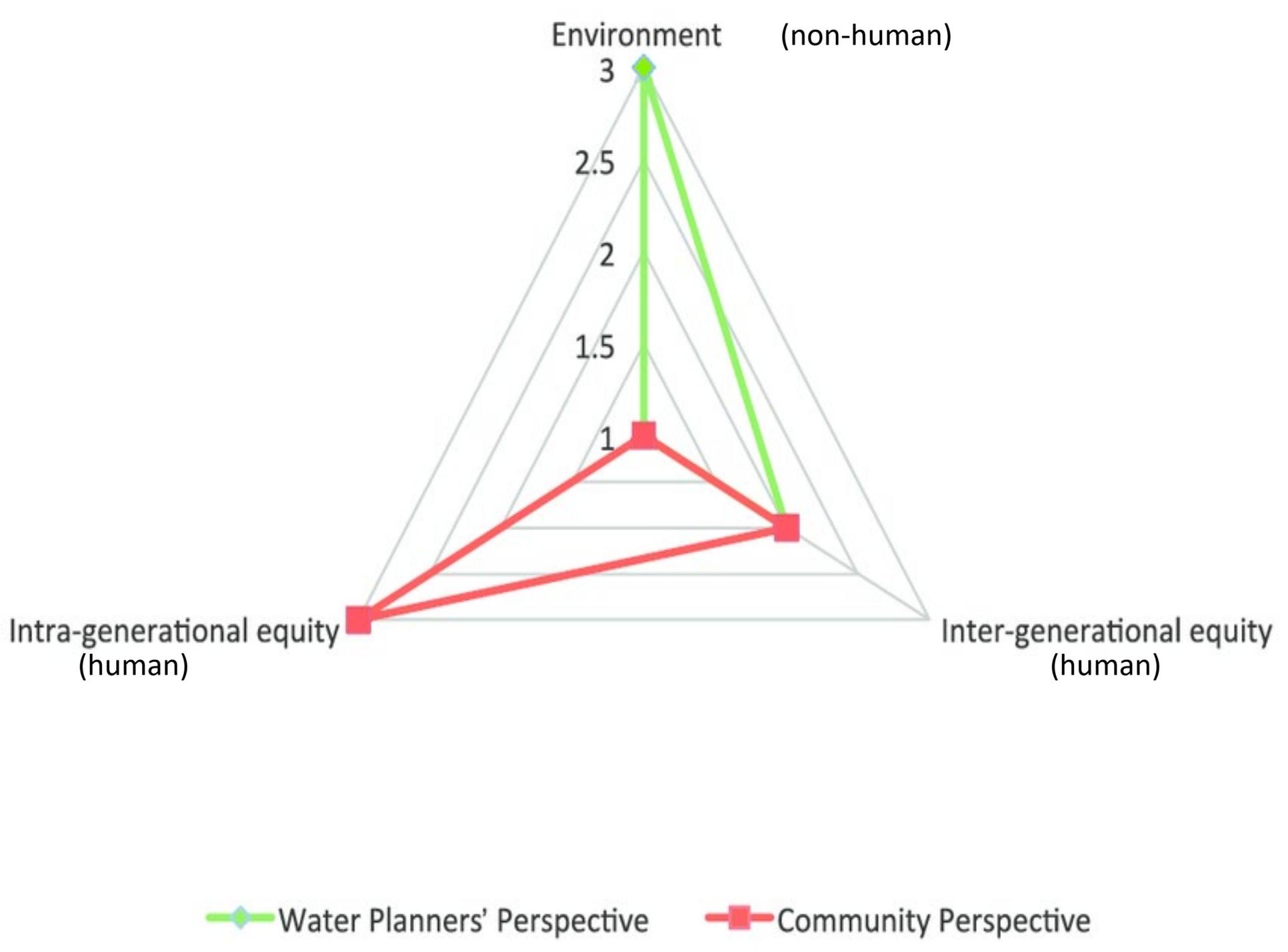
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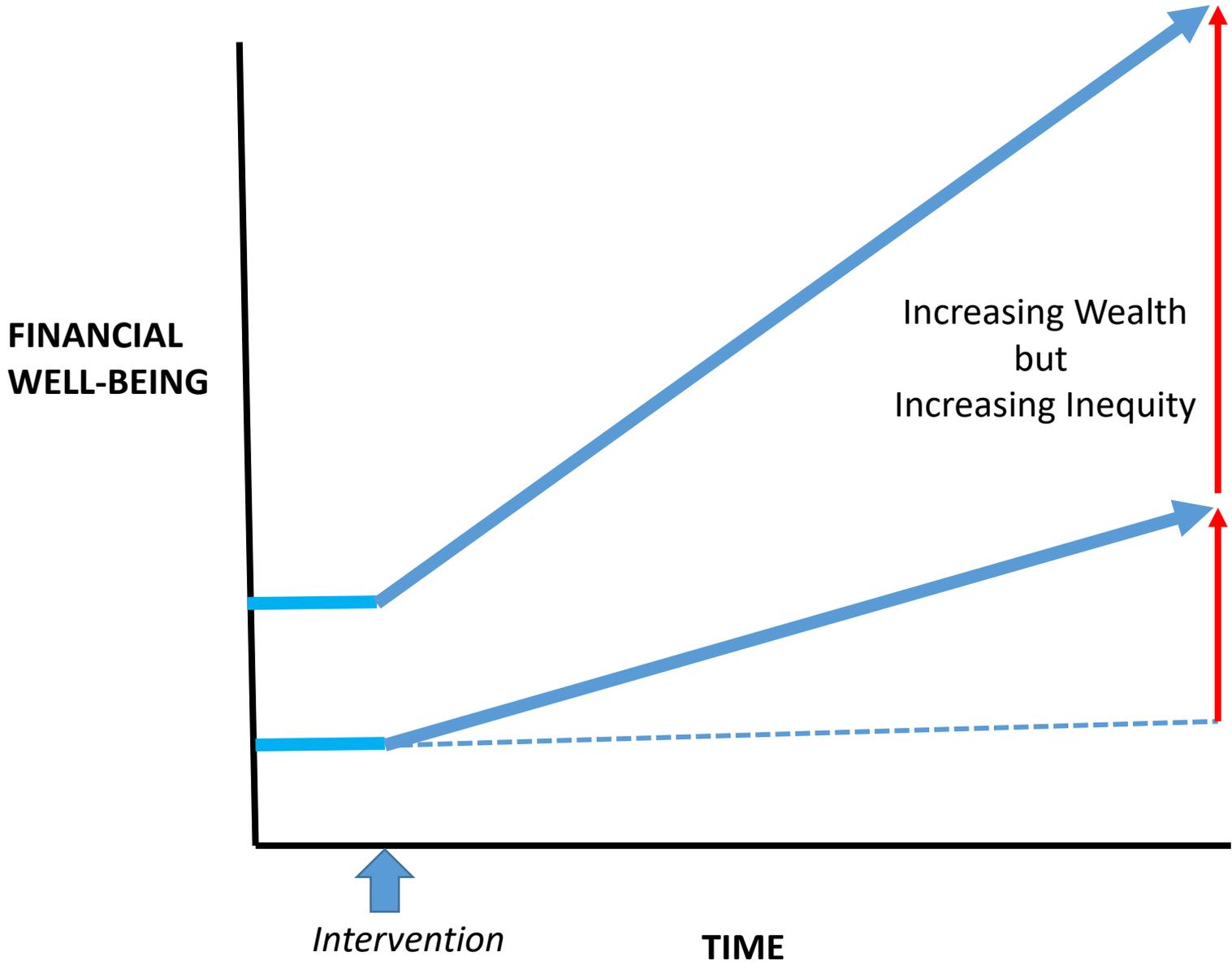
Intra-generational equity (human)

Inter-generational equity (human)

Water Planners' Perspective

Community Perspective







**THANK YOU**



