

# Estimating Non-Market Impacts of Climate Change and Climate Policy

paper prepared for the  
OECD Workshop on the Benefits of Climate Policy:  
Improving Information for Policy Makers  
12-13 December 2002, Paris

Dale S. Rothman  
(with assistance from Bas Amelung and Philippe Polome)  
ICIS



International Centre for Integrative Studies (ICIS)

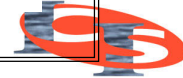
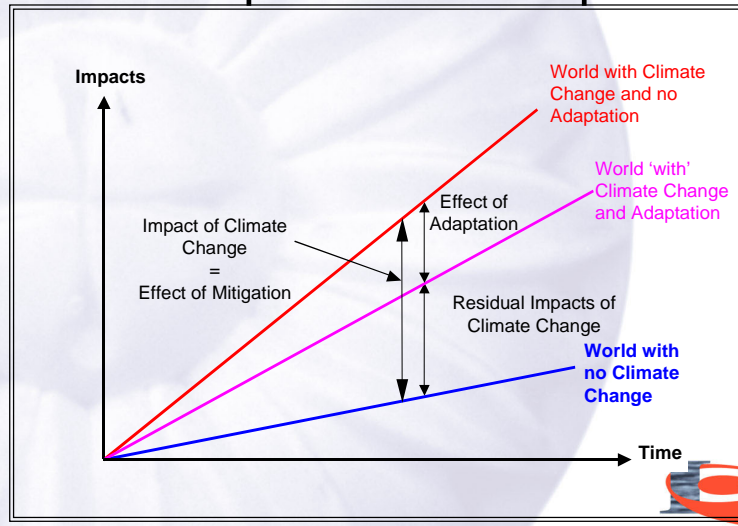
## Outline

- The Proper Context
- Defining Impacts
- Going from Impacts to Values
- Methods of Valuation
- Final Thoughts



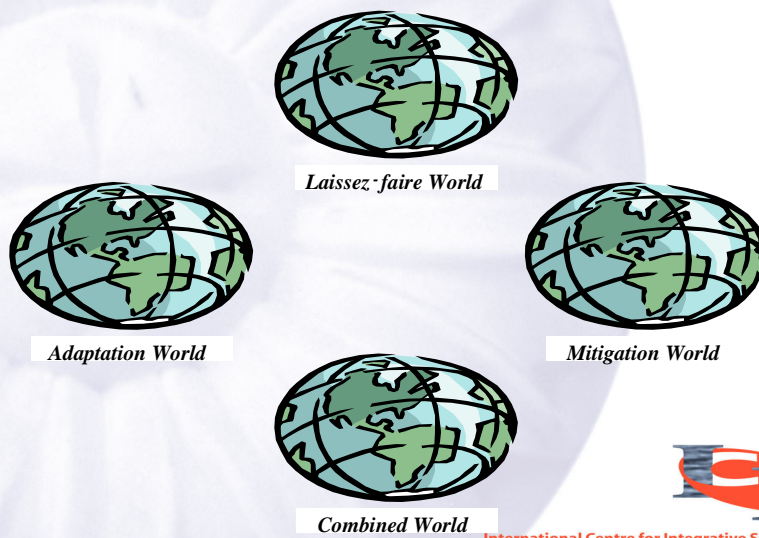
International Centre for Integrative Studies (ICIS)

## Traditional representation of climate impacts and adaptation



International Centre for Integrative Studies (ICIS)

## Alternative representation of climate impacts and adaptation



International Centre for Integrative Studies (ICIS)

- Mitigation world – (avoided) climate-related impacts + non-climate-related impacts from mitigation policy.  $\Delta Cl_{M,L} + \Delta NCl_{M,L}$ ;
- Adaptation world – (reduced) climate-related impacts + non-climate-related impacts from adaptation policy.  $\Delta Cl_{A,L} + \Delta NCl_{A,L}$ ; and
- Combined world – (avoided and reduced) climate-related impacts + non-climate-related impacts from mitigation and adaptation policy.  $\Delta Cl_{C,L} + \Delta NCl_{C,L}$



International Centre for Integrative Studies (ICIS)

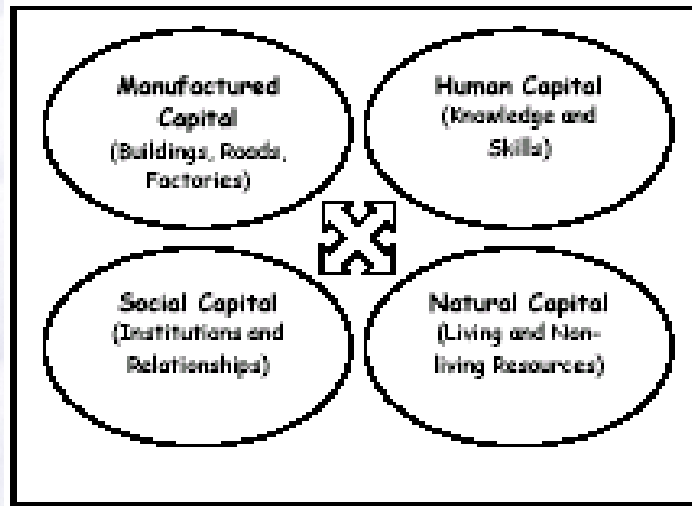
## Impact Categories Physical Standpoint

- Atmospheric systems
- Aquatic systems
- Geologic systems (especially soils)
- Biological systems (including humans)
- Built environment (including buildings, machinery, infrastructure etc)



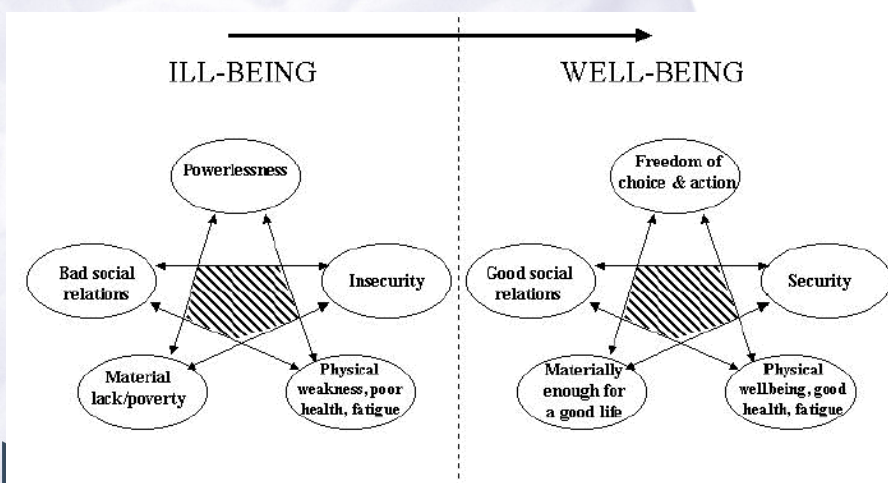
International Centre for Integrative Studies (ICIS)

## Impact Categories Productivist Standpoint



International Centre for Integrative Studies (ICIS)

## Impact Categories Human Well-Being Standpoint



International Centre for Integrative Studies (ICIS)

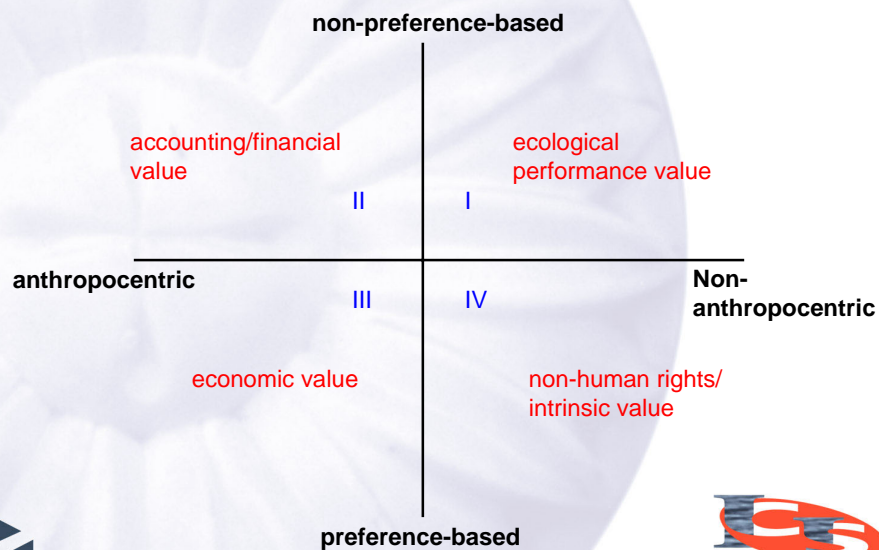
## Impact Categories Standard Study (Smith and Hitz)

- Agriculture
- Coastal (sea level rise)
- Water
- Health
- Terrestrial ecosystems
- Forestry
- Marine ecosystems
- Biodiversity
- Energy



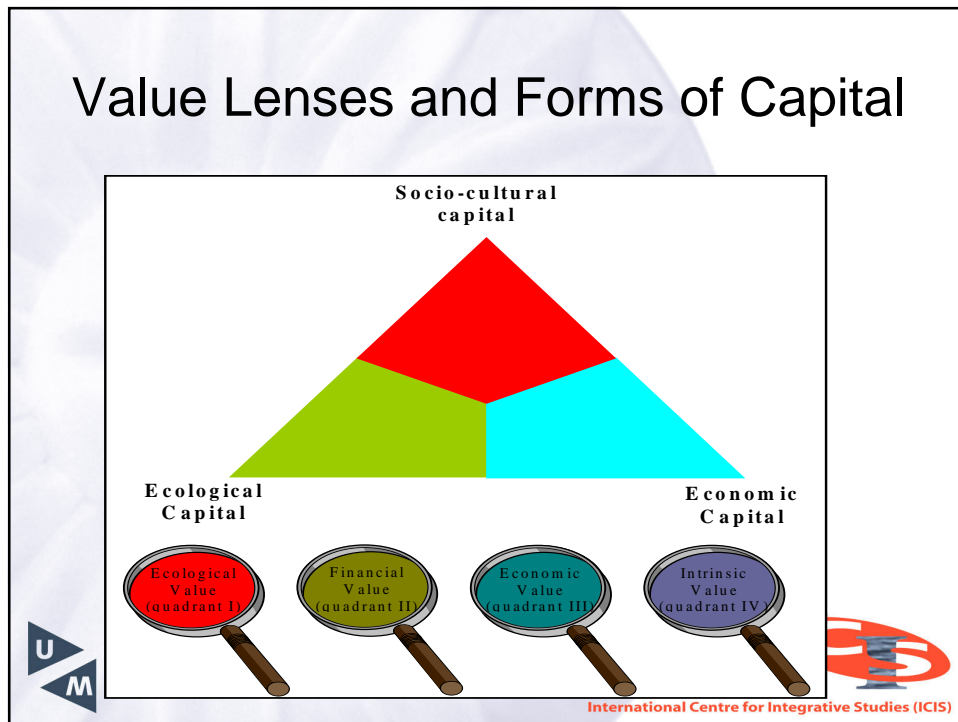
International Centre for Integrative Studies (ICIS)

## Value Paradigms



International Centre for Integrative Studies (ICIS)

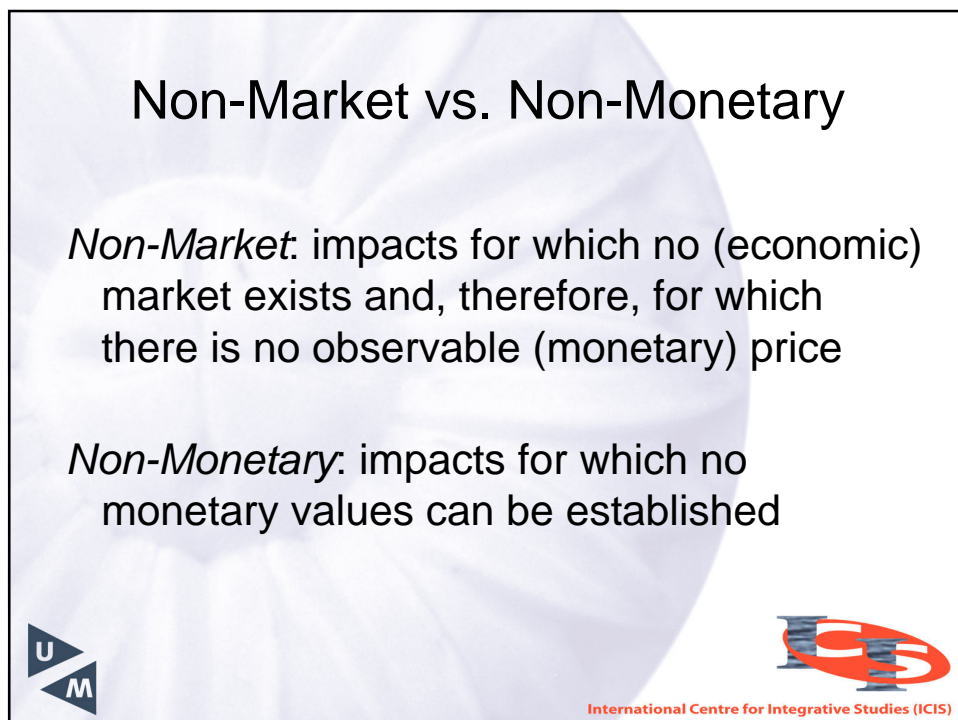
## Value Lenses and Forms of Capital



## Non-Market vs. Non-Monetary

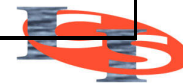
*Non-Market:* impacts for which no (economic) market exists and, therefore, for which there is no observable (monetary) price

*Non-Monetary:* impacts for which no monetary values can be established



# Techniques for Economic Valuation

Type of Market		
Conventional	Implicit	Constructed
Direct Purchases	Travel Cost	Artificial Market
Effect on Production	Hedonic – wage, property value	Contingent Valuation
Effect on Health	Proxy Marketed Goods	Conjoint Analysis
Cost of Illness		
Defensive/Preventative Expenditure		
Replacement Cost		
Shadow Project		



International Centre for Integrative Studies (ICIS)

# Marginal vs. Non-Marginal Change

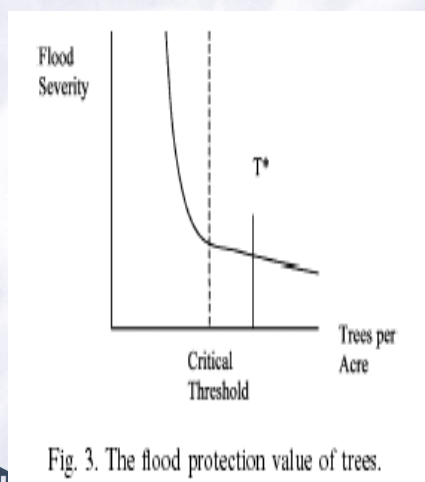


Fig. 3. The flood protection value of trees.

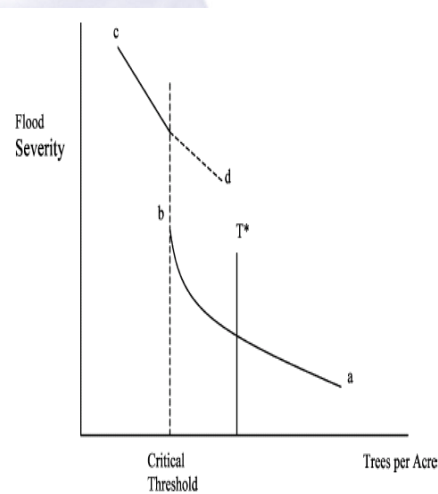


Fig. 4. Flood protection values of trees with ecosystem irreversibilities.



International Centre for Integrative Studies (ICIS)

## Final Thoughts

- Don't mix apples and oranges
- Just because you have a hammer, don't assume that everything is a nail
- Admit your inadequacies



International Centre for Integrative Studies (ICIS)