

# Ecosystem Services SRA

*research* FOR A SUSTAINABLE FUTURE

Presenter: Dr. Rod Duncan  
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# What are ecosystem services?



# Why are we measuring?

- “...when you can measure what you are speaking about, and express it in numbers, you know something about it; but when you cannot measure it, when you cannot express it in numbers, your knowledge is of a meagre and unsatisfactory kind; it may be the beginning of knowledge, but you have scarcely in your thoughts advanced to the stage of Science, whatever the matter may be.”
  - Lord Kelvin (1883) lecture delivered at the Institution for Civil Engineers, London.

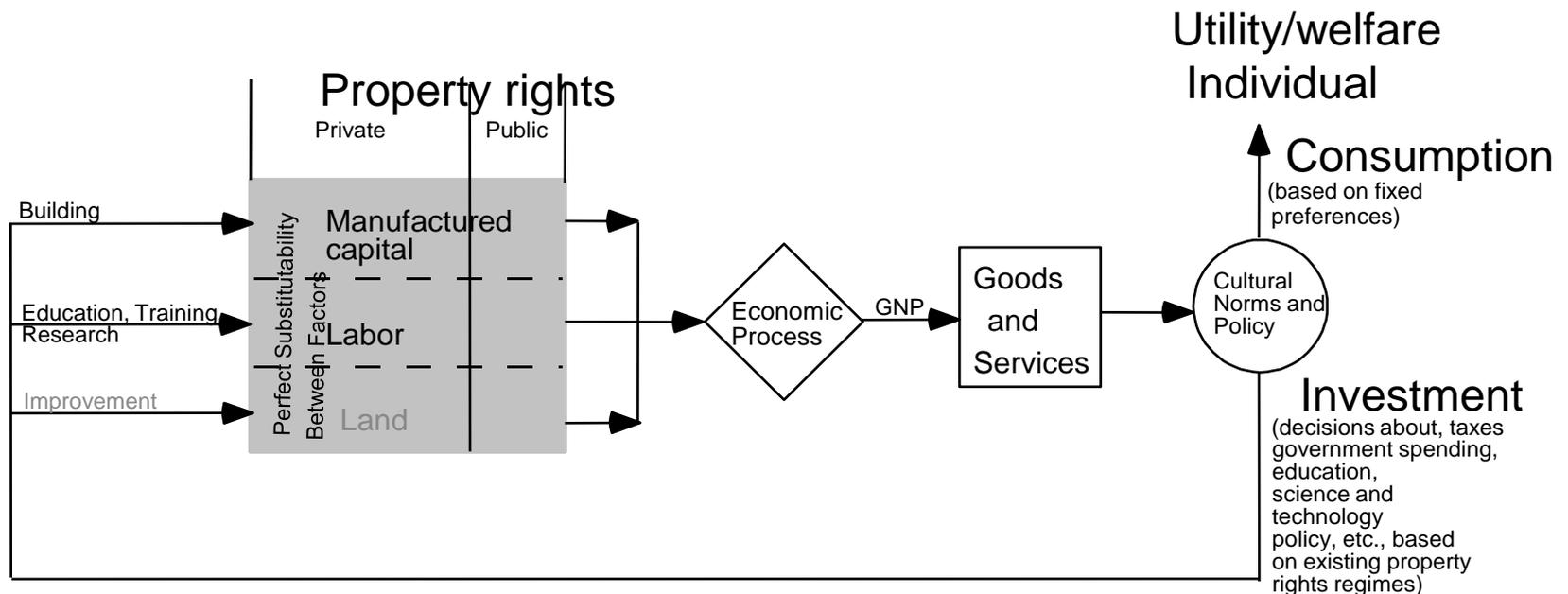
# What are ecosystem services?

- ES is an area of research, but it also a political program. The stated intention of many of the researchers in the program is to influence decision-makers. The title of a US National Research Council report (2005) Valuing Ecosystem Services: Toward Better Environmental Decision-Making suggests as much.

# What are ecosystem services?

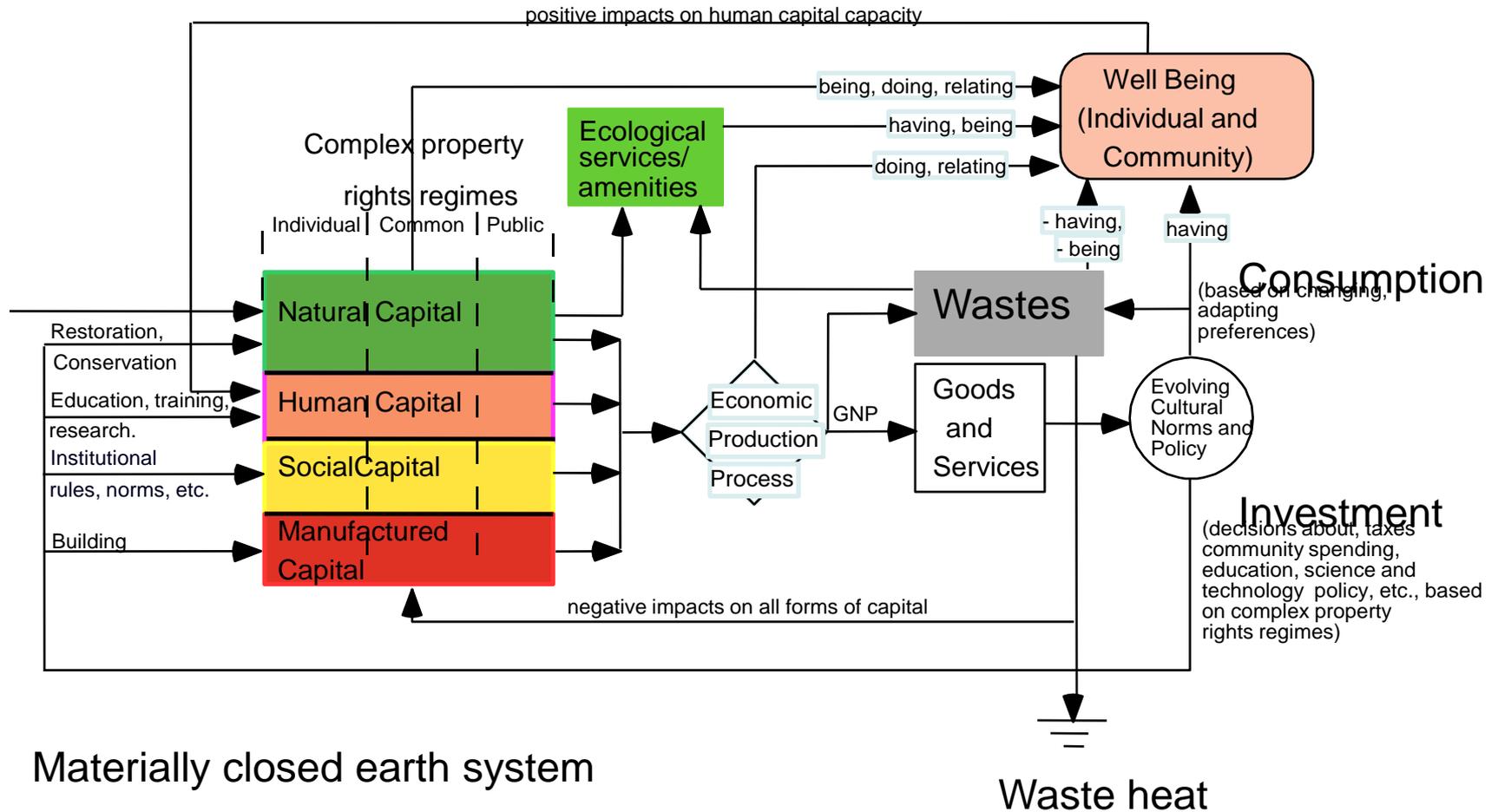
- Costanza et al (1997) *Nature* is regarded as one of the papers that initiated the research area:
  - “Because ecosystem services are not fully ‘captured’ in commercial markets or adequately quantified in terms comparable with economic services and manufactured capital, they are often given too little weight in policy decisions.” (p. 253)
- The ES research program is an attempt to provide the numbers for the value of ecosystem services- to answer Lord Kelvin’s demand- so that decision-makers can properly value the environment.

# Costanza's "empty world" model



From Costanza "Ecological economics: Creating a sustainable and a desirable future" Powerpoints.

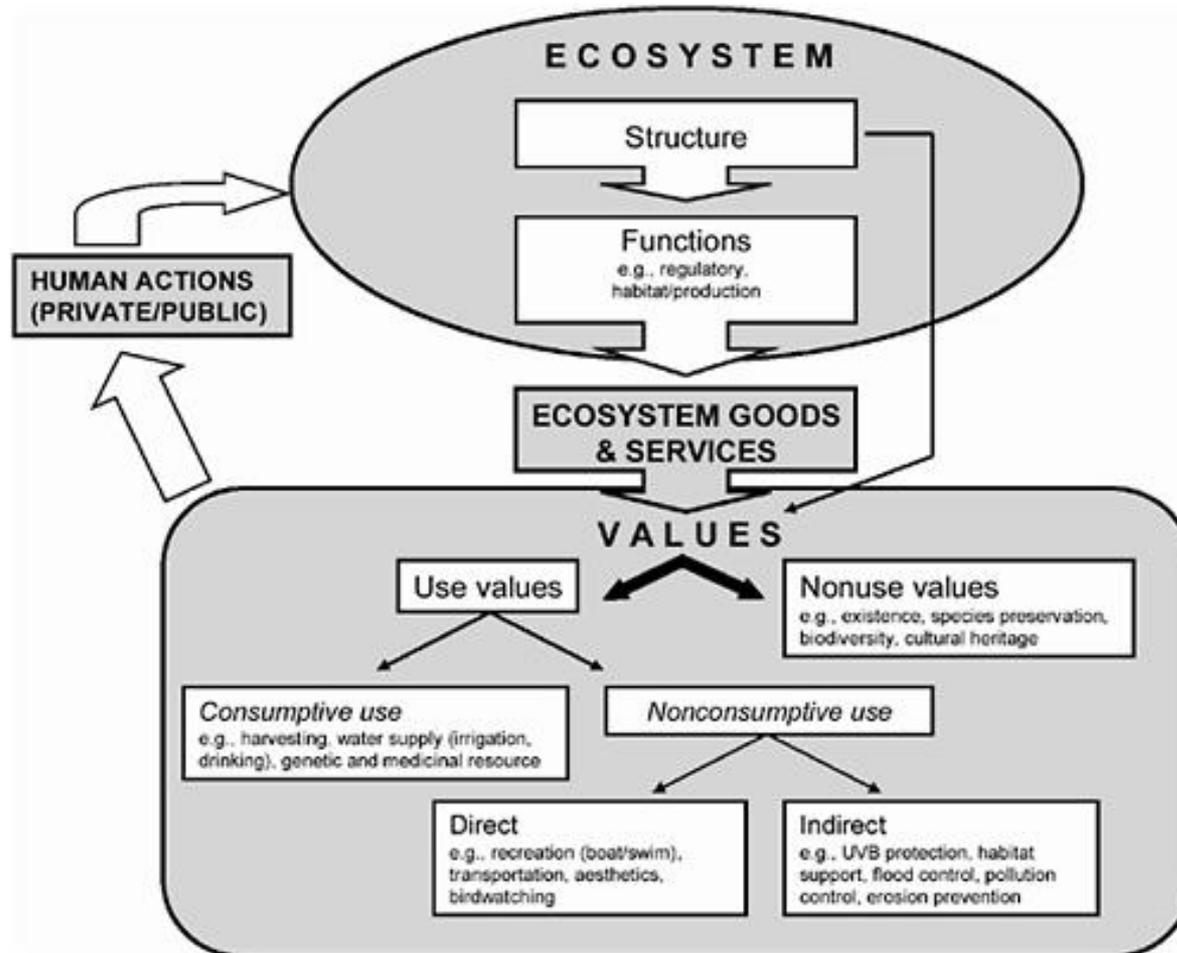
# Costanza's "full world" model



Materially closed earth system

Waste heat

# How ES works.



# The SRA team

- Dr. Rod Duncan- environmental economics
- Prof. Max Finlayson- ecology, biology
- A/P Gary Luck- ecology, biology
- Prof. Mark Morrison- environmental economics

# Current projects

- Integrating conservation and ecosystem service values in Australia's catchments. ARC Future Fellowship involving collaboration with UBC, Stanford University and UQ. (Gary Luck)
  - Project will examine approaches to developing prioritization schemes for biodiversity conservation and ES protection, and examine planning scenarios for both using the software program InVest from the Natural Capital Project.

# Current projects

- Maximising the delivery of ecosystem services to agriculture. (Gary Luck) ARC Discovery
  - Examining landscape management options to improve the delivery of ecosystem services such as pollination, pest control and waste decomposition.
- Costs and benefits of birds in almond orchards. (Gary Luck) ARC Discovery
  - Examining management options for maximising production and conservation gains in almond orchards, limiting bird impacts to crops, and improving benefits provided by birds to growers (e.g. pest control).
- Pollination in almond orchards. PhD project.

# Current projects

- *Valuation of ecosystem services in the Macquarie Marshes* (Mark Morrison, Kevin Boyle, Peter Boxall, John Rose)
  - Repeat of 1997 study. Data is collected and study is in the analysis stage. Expect to have 2 papers and a workshop for DECCW.
- *Valuation of ecosystem services in the Murray River* (Mark Morrison, Kevin Boyle, Darla Hatton MacDonald, John Rose)
  - Stated preference study of values of environmental goods and services. Additional work planned focussing on tradeoffs between vegetation types.

# Current projects

- *Integrating production and valuation models to understand optimal lot size in agriculture in peri-urban areas (Behrendt PhD)*
  - A PhD using farm models and valuation techniques to determine optimal farm size.

# Future projects

- Improved management of wetland ecosystem services to increase adaptive capacity and reduce poverty in sub-Saharan Africa (Max Finlayson)
  - Submitted by UNESCO-IHE, Delft, Netherlands, on behalf of a consortium including ILWS, to the UK (combined program by NERC, ESRC and DfID for Ecosystem Services for Poverty Alleviation).
- *Valuation of ecosystem services in the Cooks River* (Mark Morrison, Rod Duncan, David Godden)
  - Expect to fund a PhD student in Sydney with assistance from David Godden at DECCW. Funding to come mainly from the Sydney Metro CMA.

# Future projects

- Proposal for a freshwater ecosystem services research cluster with La Trobe, CSIRO, UQLD, Adelaide, ANU and UNE.

## *our aim...*

to undertake internationally recognised and integrated research in social and environmental sustainability to enhance the livelihoods and lifestyles of people in rural and regional areas

### **CHARLES STURT UNIVERSITY LOCATIONS WITHIN AUSTRALIA:**

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