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SCHOOL OF AGRICULTURAL &
RESOURCE ECONOMICS

Prioritising environmental research

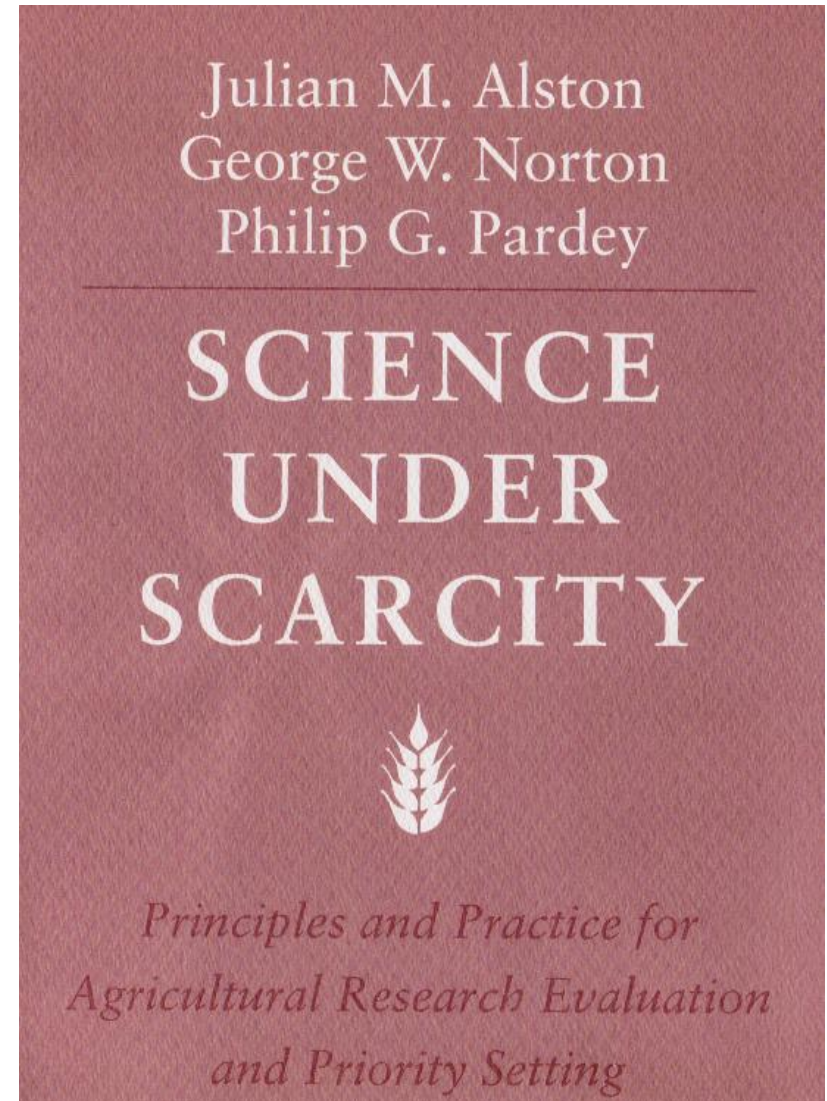
David Pannell

*ARC Federation Fellow
Centre for Environmental Economics and Policy
School of Agricultural and Resource Economics*



Prioritising agricultural research

- Lots of research and analysis on economics of agricultural research



Prioritising environmental research

- Alston et al. (1995): “To a great extent the literature has neglected this topic.” (p.76-77)
- *Ad hoc* – no conceptual framework
- Almost all focus on one narrow aspect

Ecology and biology of
paddlefish in N. America



Types of “environmental” assets

Private goods
Market values

Agricultural land



Fisheries

Water (quantity)

Water (quality)

Public goods

Non-market values

Biodiversity

Threatened species

Wetlands

Native vegetation



What are we prioritising?

- Type of research

- ❖ Discovery

- ❖ Knowledge (assets and management)

- ❖ Decision support

- ❖ Technology development

- Within each type, different things to prioritise

- Type of asset researched

- ❖ Koalas

- ❖ Coral reefs



- Spatial location for research



- Specific aspect researched

- ❖ Value

- ❖ Threats



Some crucial differences

Agricultural research

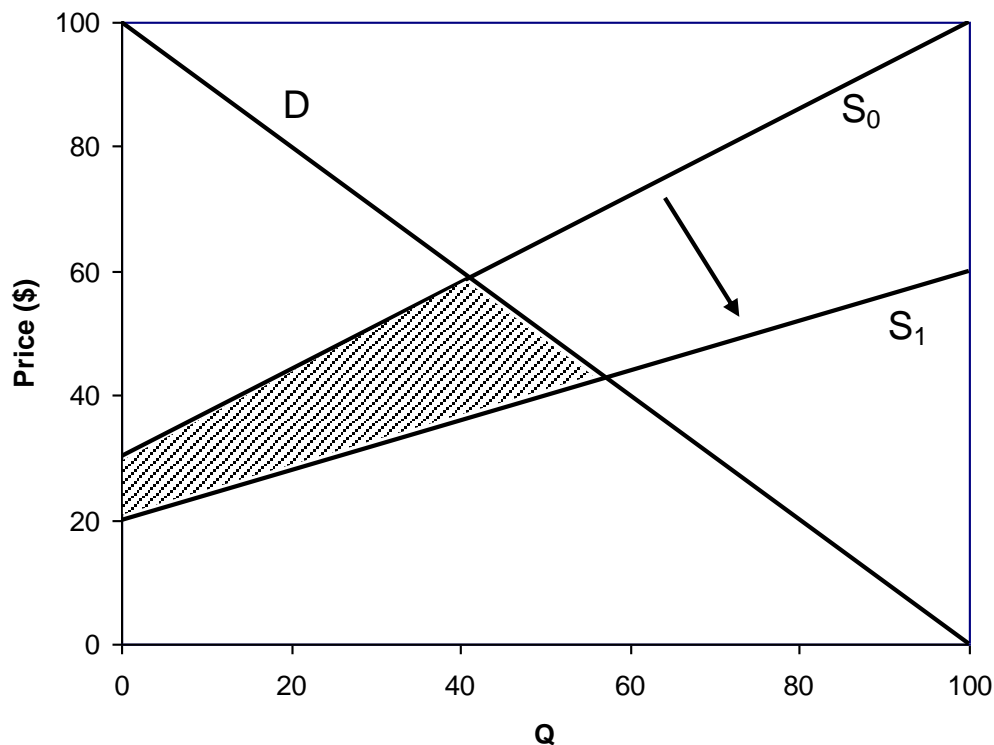
- Fairly good info
- Adopters = Farmers
 - ❖ Driver: economics
 - ❖ Currently make fairly good decisions

Environmental research

- Gaps >> info
- Environmental managers
 - ❖ Driver: politics, etc.
 - ❖ Often make poor decisions



Benefits (agriculture)



Environment: non-rival benefits
→ zero MC → no supply shift



Benefits (environment)

Interest

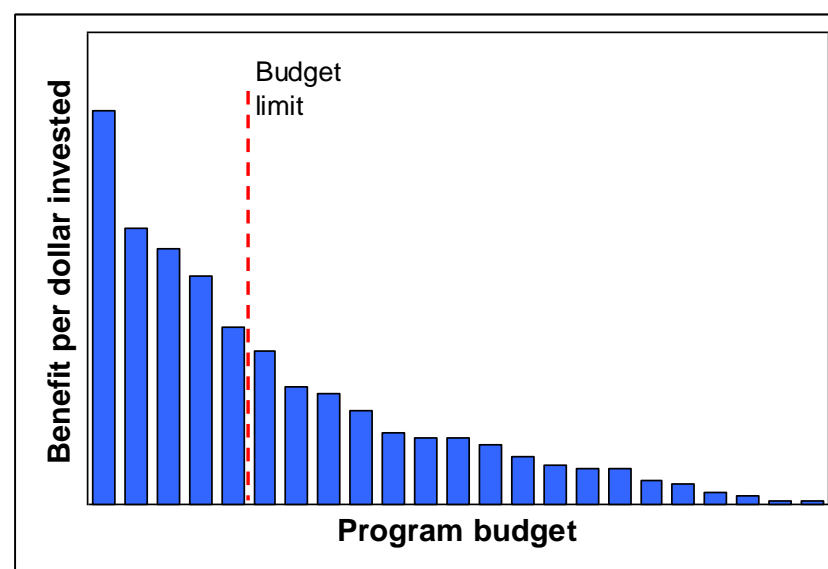
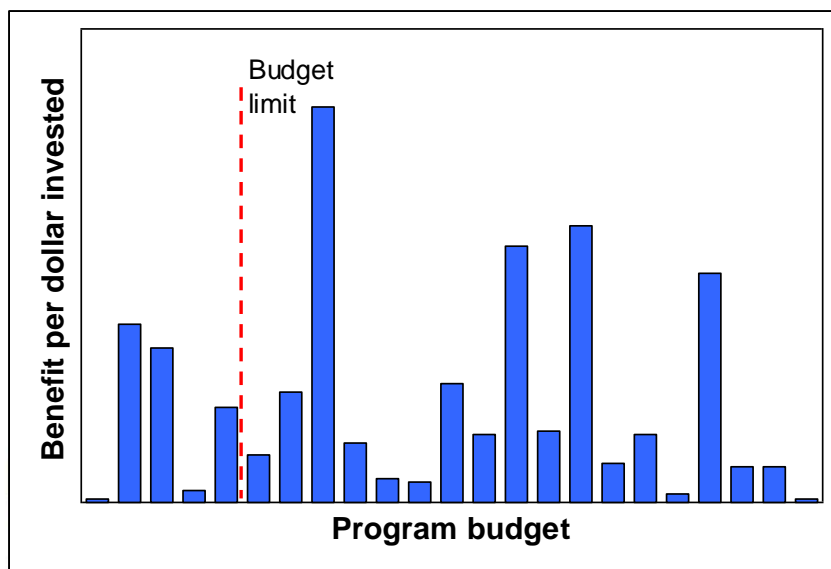
Better environmental outcomes

Better prioritisation
of investment in
management projects

Better design of
management projects

Without research

With research



Value of research information

- Bayesian decision theory provides a way to value information

1. Decision makers start with prior knowledge
2. There is a strategy that appears optimal based on that knowledge
3. Research provides new information
4. Decision makers' knowledge is updated
5. The optimal strategy may change
6. Estimate the extra benefits (5 vs 2)



Value of research info depends on

- How bad the existing knowledge is (1) ★
- Relevance/credibility of the new info (3, 4) ★ ★
- How much optimal decision changes (2, 5) ★
- Benefits from changing decision (6)
 - ❖ Flat payoff functions? ★
 - ❖ Quality of decision process ★ ★
 - ❖ Importance of decision ★ ★ ★



importance as criterion for
prioritising information research



Importance of decision

- Larger scale of benefits from environmental investments → larger research benefits
- Varies a lot, depending on
 - ❖ Values of assets
 - ❖ Threats to asset condition
 - ❖ Effectiveness of management
 - ❖ Time lags to benefits
 - ❖ Adoption by land managers
- Need preliminary prioritisation of environ projects (e.g. INFFER) as input to research prioritisation
 - ❖ Integrate prioritisation of management and research



Other factors influencing net benefits of research

- Probability of success of research
- Time lags (research, adoption)
- Adoption by environmental managers
- Research costs
- Costs of adoption (extension, training, adjustment, ...)

Adoption: often extremely challenging for environmental research.
Decisions emotive, politicised, rushed, path-dependent, consensus-driven.



Concluding comments

- Considerable scope to improve the prioritisation of environmental research
- Beginnings of a framework
- Insights into the key factors
- Big issues: Integration of R&D with management; adoption & quality of decision process

