How might we value & pay for public goods

DNPA Workshop, February 2019

Prof Brett Day
‘Public money for public goods!’  Scheme design
Types of ‘goods’

Private

Have to pay to acquire and benefits enjoyed only by owner.

Public

Available to everyone and they don’t have to pay for it.
Providing Public goods

Costly changes on farm → Public Good → Beneficiaries

Social Value

£WTP_i \sum_{i=1}^{N} \quad \text{yes} 

no \quad £0

Is social value greater than cost?
What you do matters ...
Where you do it matters ...
Calculating values ...
NEV Model Suite
NEVO
Designing Schemes

Principal-Agent Problems
## Getting Incentives Right

### THE SUNDAY TIMES: UNIVERSITY GUIDE 2015 (ECONOMICS)

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Design considerations:

- very small quantity breaks standard
- new substitute pesticide more costly
- uncertainty over substitute efficacy
- farmer access, trust, moral hazard
- actual pesticide use unobservable
- some farmers already organic
Scheme Design

- Participation Payment
- Trust & Pre-commitment
- Cost of switching
- Product Substitution Payment
- Asymmetric Information
- Discretionary Top-Up Payment
- Uncertainty
- Catchment Performance Bonus

[Logo: Slug it Out, healthy crops, healthy water]
Scheme Design

2014

2016
Things to think about

1. Defining the scheme:
   Objectives and constraints

2. Designing the contracts:
   What to pay for

3. Allocating the contracts:
   Who to pay and how much

4. Implementing the scheme:
   Monitoring and enforcing
Designing Contracts: What to pay for

Activity

Outcome
Designing Contracts: **Activity or Outcome?**

**Activity:**
- Do the activity ... and no more
- Low cost activity ≠ high benefits
- Pay even if low actual benefits

**Outcome:**
- Encourages doing more
- Encourages innovation
- Only pay for actual benefits
Designing Contracts: **Activity or Outcome?**

**Activity:**
- When ‘scientists’ know best what delivers outcome

**Outcome:**
- When farmers know best what delivers outcome
Designing Contracts: **Activity or Outcome?**

**Measurability**

**Activity:**
- Assets or land use easy to verify
- Operational activity hard to measure

**Outcome:**
- When & where? Varies over space & time
- What Scale? Farm, catchment, landscape?
- Who is responsible?
Designing Contracts: **Activity or Outcome?**

**Activity:**
- Unexpected costs

**Outcome:**
- Unexpected costs
- Other farmers’ activities
- Environmental factors

*Risk*
Designing Contracts: **Activity or Outcome?**

**Activity:**
- Poor outcome risk falls on purchaser

**Outcome:**
- Poor outcome risk falls on farmer

**Risk-Sharing**
- Reward effort and performance
- Activity fee and performance bonus
Allocating Contracts: **Who & how much?**

- Posted Prices
- Competitive Tender
- Negotiation
Allocating Contracts: Negotiation

- Targeting particular farms
- Special circumstances
- Strength of negotiating position
Allocating Contracts: Posted Prices

- Prescribe activities or performance
- Farmers choose whether to participate at posted price
Allocating Contracts: Auctions
Need to offset 40 tonnes of N each year

Pay farmers to plant cover crops

- Online bidding platform
- Calculates N from each project
- Bids as £ per tonne of N
- Lowest cost bids win
- Can update bid
Need to offset 40 tonnes of N each year

- Different payments for same thing
- Cunning farmers sneak in last min bids

New Design:
- Open with a high price
- ‘Yes’ or ‘No’ or ‘Best bid’
- Too much demand ... drop price
- Everyone paid the same
- No opportunity for sneaky bidding
Dartmoor

- Daily operational decisions make a difference
- Contribution of each farmer unobservable
One size does **NOT** fit all.
Objectives:

- Clear and measurable outcomes by which to judge success
- Consider potential perverse incentives
- Outcomes should relate to public good delivery
- Measure of outcome agreed across all parties ... and verifiable
Dartmoor

- Incentives:

  Participation Payment:
  - Align interests of farmers

  Outcome Payment:
  - Bonus on group achievement payable to each individual
  - Everyone gains/loses bonus for exceedance/short fall

  Individual Monitoring:
  - Guarantee bonus if agree to individual monitoring

  Activity Payment:
  - Payment for measurable activities correlated with positive outcome
  - Perverse-incentives

  Risk-Sharing:
  - Activity payment with outcome bonus