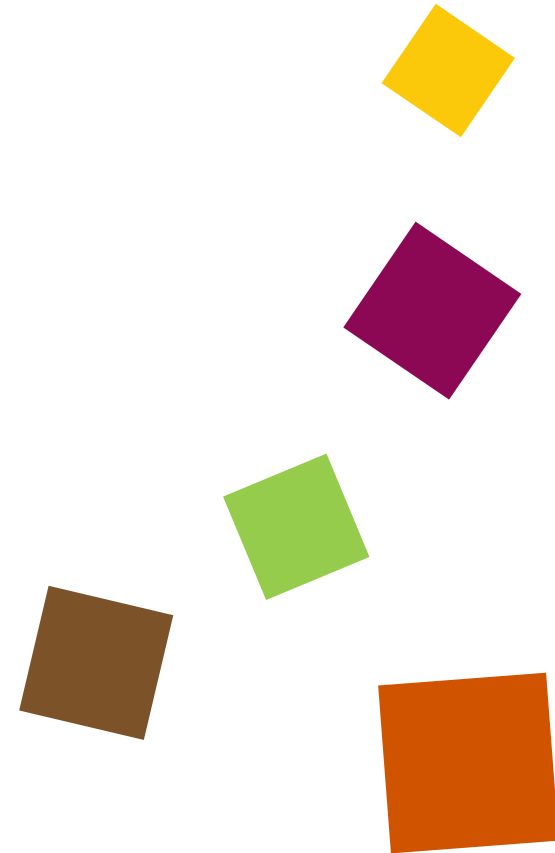




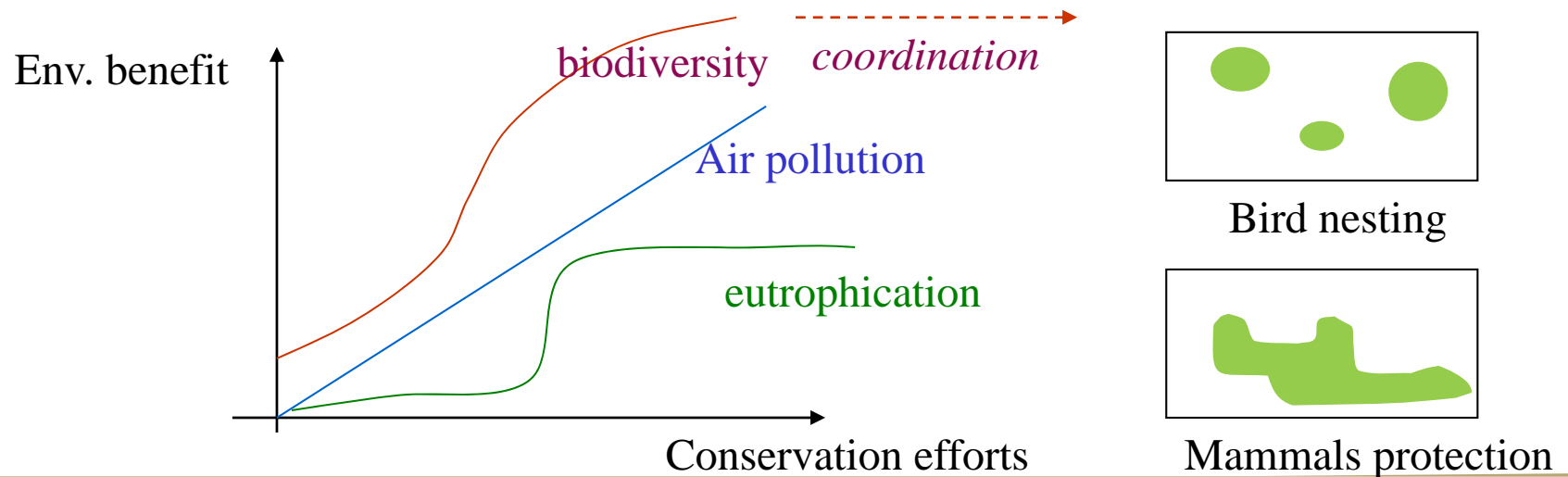
# Designing conservation auctions

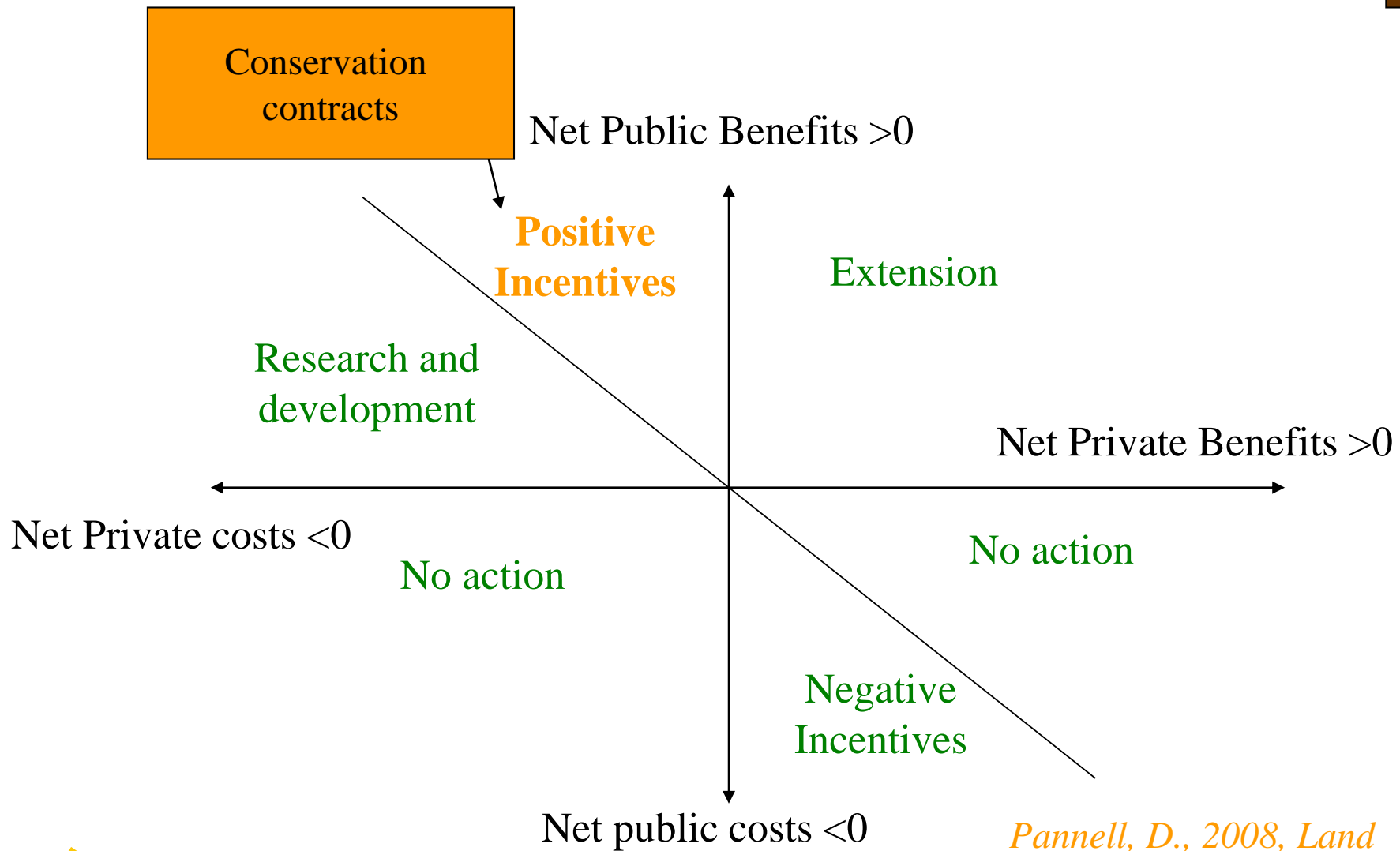
Sophie Thoyer



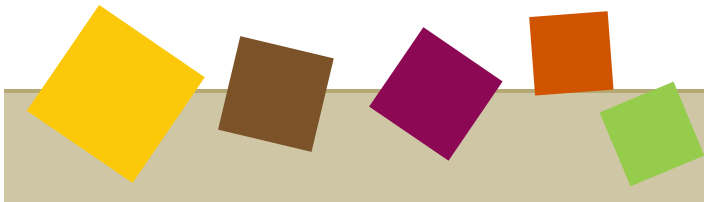
## SOME FACTS

- On private land /on area with traditional land users
- Conservation actions have an opportunity cost
- They often provide multiple environmental outcomes
- With a mix of private and public benefits
- Which are rarely linear with conservation efforts





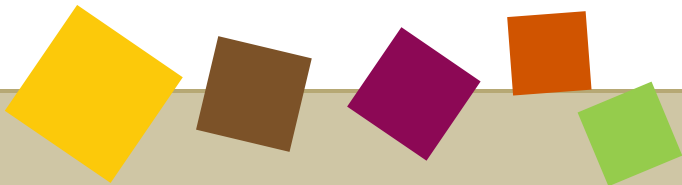
*Pannell, D., 2008, Land Economics, 84(2): 225-240*



- An ES buyer proposes a **payment**
- to **voluntary** land users
- accepting to adopt (or maintain) a given **set of land management practices,**
- for a **given period**
- on **given areas**
- and contributing to the improvement of one or several **environmental objectives**



- **Social efficiency:** marginal value of environmental improvement equal to marginal costs of generating this improvement
- **Allocative efficiency:** contracts are allocated to the lowest-cost providers of environmental services
- **Budget efficacy:** the environmental improvement is achieved at the lowest budget cost (payments + transaction costs)
- **Enforceability:** Compliance is monitored and non compliance is sanctioned
- **Acceptability:** participation of land users, equity and procedural fairness;



## Willingness to accept?

- OC of compliance
- WTC to the public good
- Private benefits of contract

Payment?

Willingness to pay  
by ES buyer?

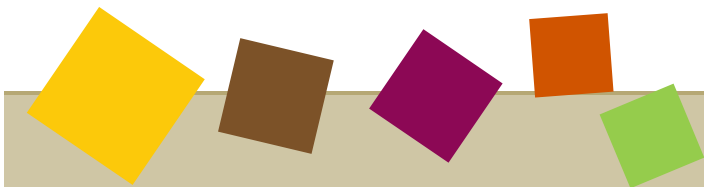
ES providers

Link between actions and  
environmental impact?

Aggregation?  
Targeting?

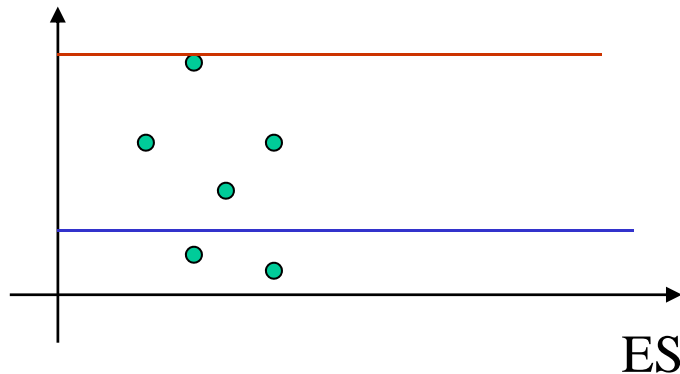
Compliance with contract?

Outcome-based  
input-based contract?



- **Fixed price contracts with given set of actions**

Unit cost of compliance

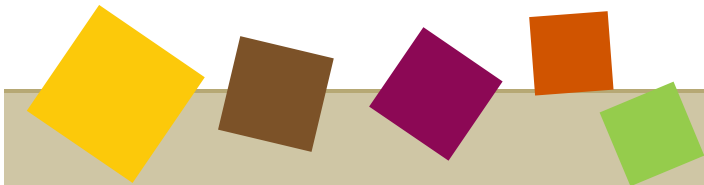


Too high: low efficacy and large budget expenditures

Too low: insufficient participation – Environmental target may not be attained.

- No flexibility
- Insufficient exploitation of farmers' heterogeneity

➡ **Other ways?**





Open outcry fish market in Sete  
(Dutch descending clock auction)

## Internet auctions (English auctions)

### 2 Buy >>

Use "Buy It Now" or place a bid

#### Buy It Now

You won't have to wait for the auction to end -- purchase your item instantly.

#### Place a bid

Enter the maximum amount you want to spend; eBay bids for you, up to the limit set by you.

#### Review Feedback

Feedback ratings are based on a user's past transactions and help you learn about the seller you're dealing with.

[Learn about eBay](#)

[How to Bid and Buy](#)

### 3 Pay >>

Once you've won, pay the seller

#### Pay for your item



You'll receive an email from eBay explaining how to pay the seller.

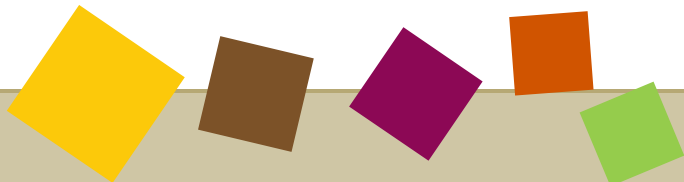
Most sellers accept [PayPal](#). It's a safe, fast, easy and free way to pay for items and you'll be protected up to \$500 on qualified listings through PayPal Buyer Protection.

Many sellers also accept payment by check or money order.

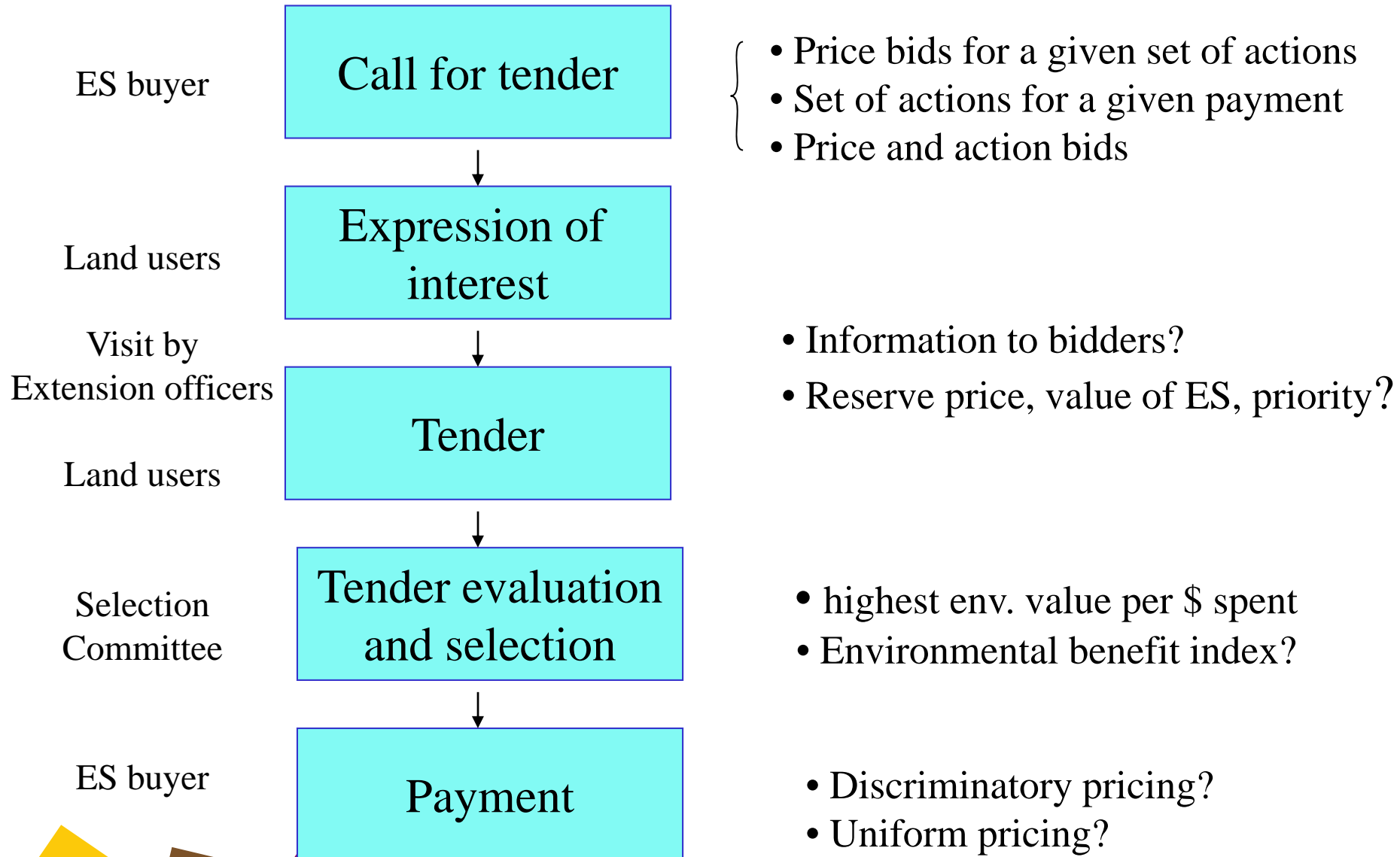
#### Get your item

After the seller receives your payment, the item is sent to you. It's that easy!

[How to Buy with Confidence](#)



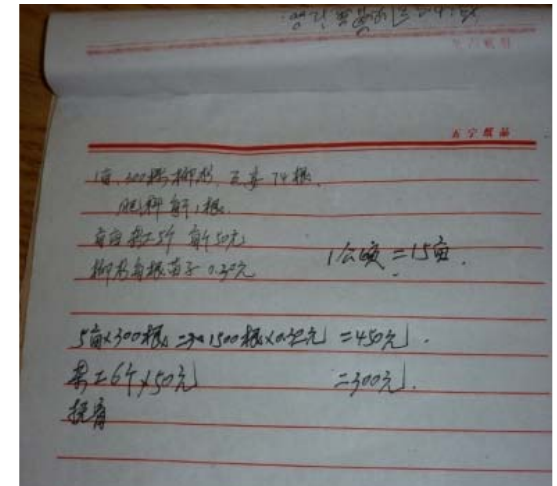




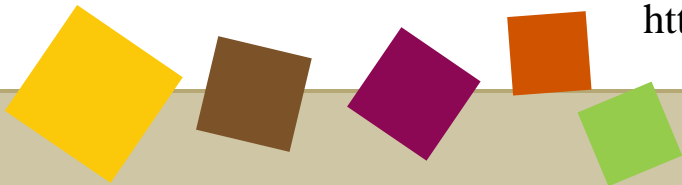


## From Jeff Bennett's web site

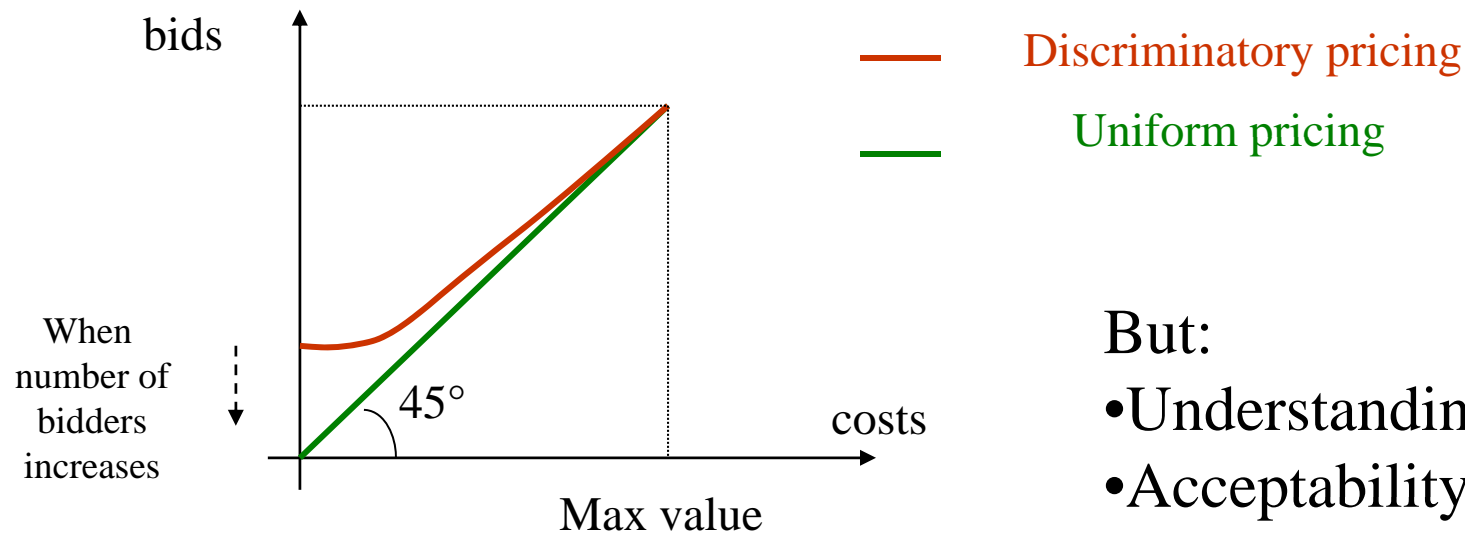
Auction to allocate afforestation  
Contracts in the Province of  
Sichuan (China)



[http://www.crawford.anu.edu.au/pdf/staff/jeff\\_bennett/china\\_land\\_use](http://www.crawford.anu.edu.au/pdf/staff/jeff_bennett/china_land_use)

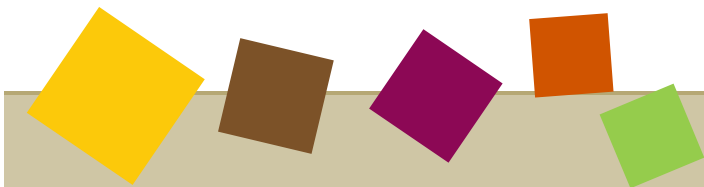


**Competitive pressure** will provide incentives to bid closer to one's true cost of compliance and to reveal information on capacity to supply environmental benefits: higher efficiency and potentially higher budget efficacy for further rounds.



But:

- Understanding of farmers?
- Acceptability by farmers?
- Transaction costs?
- Repetition and collusion?



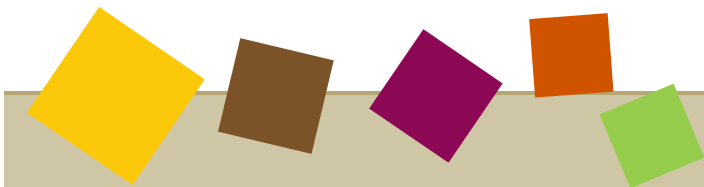
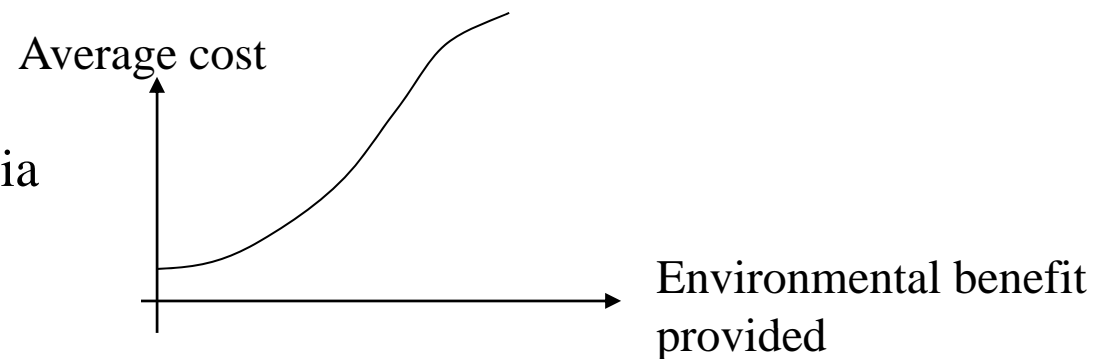
1) **Trade off between simplicity and flexibility**

- Preference to let land users bid both for actions and for prices
- Exploits better heterogeneity in land use and qualities

But harder to rank – need for more investigation on the links between practices and environmental impact (including random shocks due to natural events)

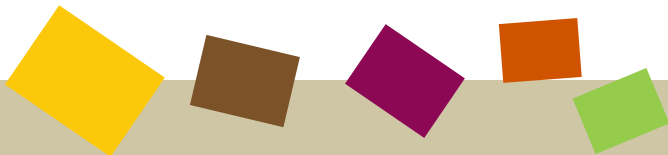
2) **Lumpy bid issue:** allow multiple bids with various levels of commitments

Ex: water buybacks in Georgia



### What information on bid selection should be revealed to bidders?

- Payment rule must be known but pre-announced reserve price can be used strategically by bidders to collude (CRP example)
- Should the auctioneer announce a budget limit or a target in terms of contracted area? (Latacz-Lohman and Schilizzi 2008)
- Should the bidder's contribution to the environmental benefit index be unveiled? (Cason, Duke and Gangadharan 2003)
- Robustness of auction outcomes to repetition? Learning on others' bids and auctioneer's objectives (Hailu and Schilizzi, 2004)



### How to aggregate multiple environmental outcomes?

#### ➤ Environmental Benefit Index

- The example of CRP: weighted sum of indices for different ES
- The example of BushTender:  $BBI = (BSS \times HSS) / \$$

BSS = Biodiversity significance Score (unrevealed)

HSS = Habitat Service Score (revealed)

➤ **Iterative process** to select the best aggregate outcome, when bid interdependencies mean that the decision to fund one contract changes the benefit score for other contracts: need for time saving heuristics (Faith et al 2003; Hajcowicz et al, 2007)

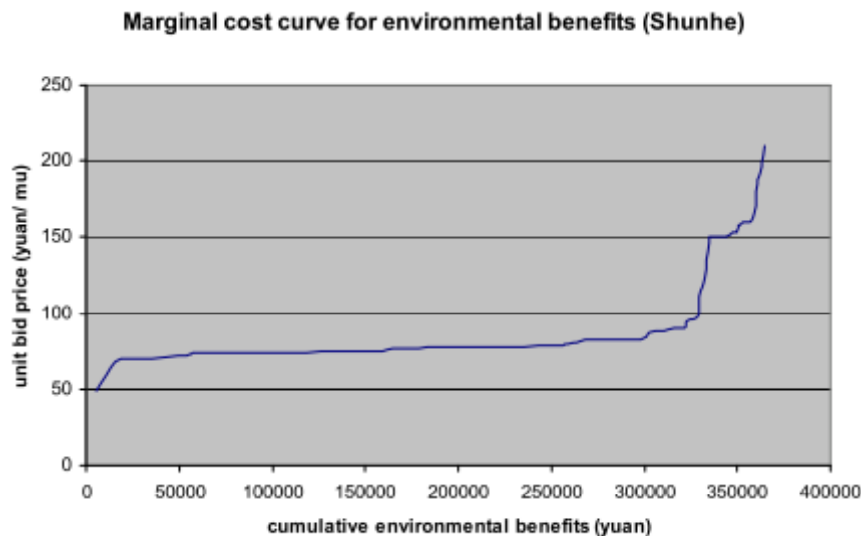
➤ **Measure directly the monetary value of ES: WTP by benefactors**  
use WTP as an undisclosed reserve price (J. Bennett, 2009)



- **Understanding by land users?**

Claims that there are large administrative and training costs to help land users with the bidding process.

But land users learn rapidly (Cummings and Laury 2005)...



Wang and Bennett, 2009

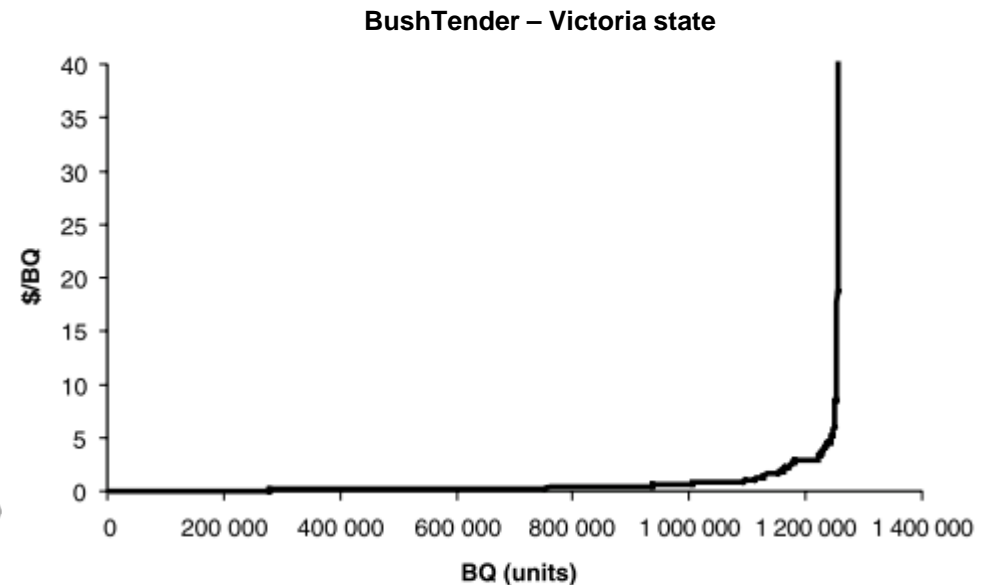


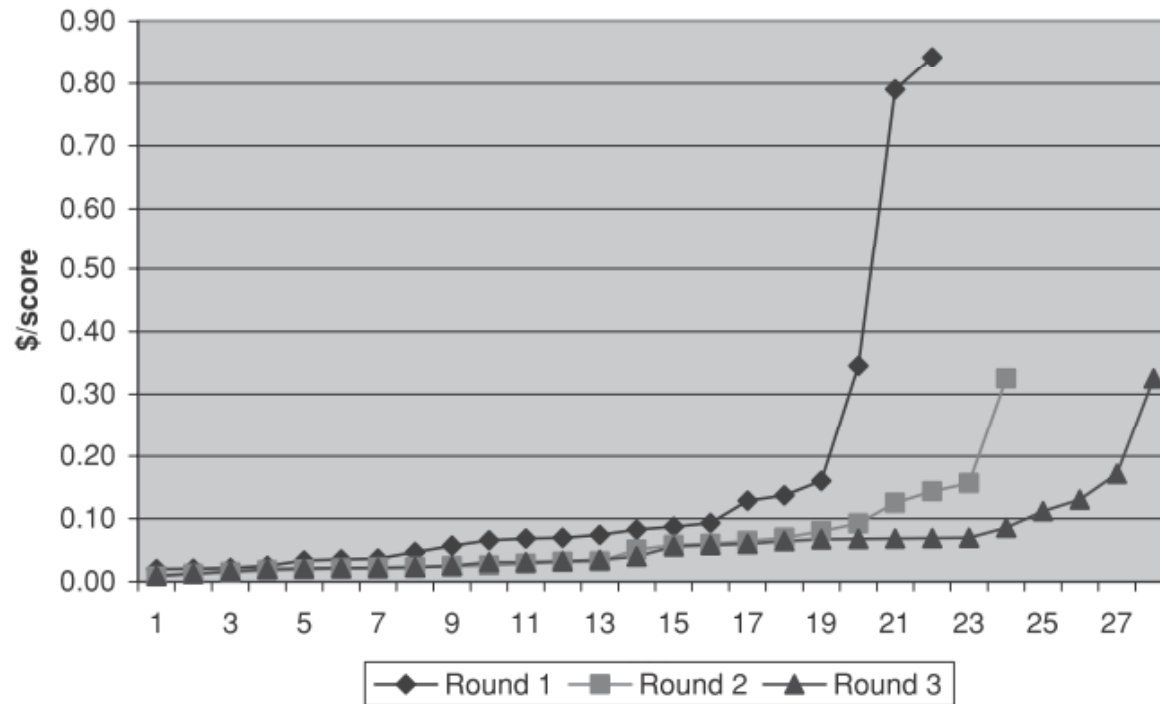
Figure 2 Marginal cost curve. Biodiversity quality (BQ).

Stoneham et al, Ajare, 2003

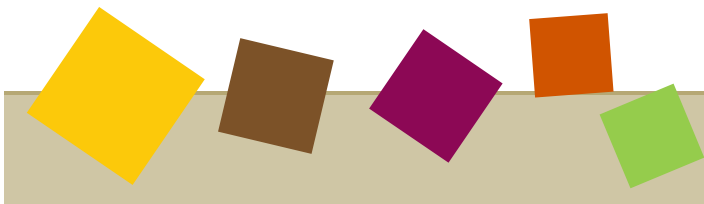


By allowing multiple bidding rounds? (Rolfe et al, CJAЕ, 2009)

But scope for more strategic bidding and higher administrative costs

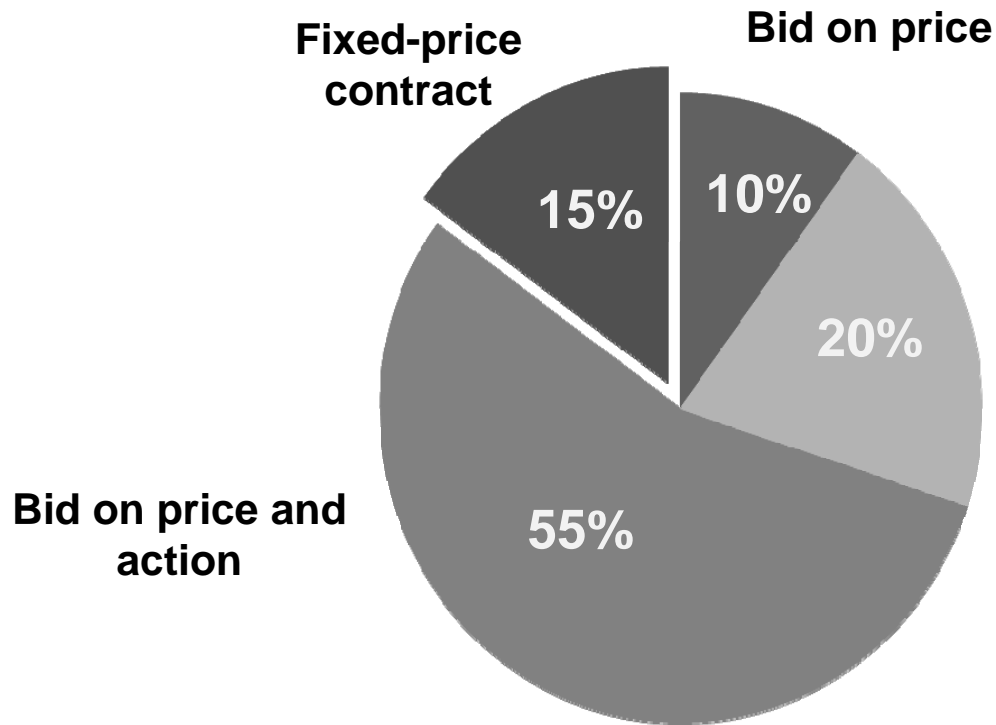


Robustness and repetition?





Results of a survey of 61 farmers in Lozere, Said and Thoyer, 2009



**Bid on price and action**

**Fixed-price contract**

**Bid on price**

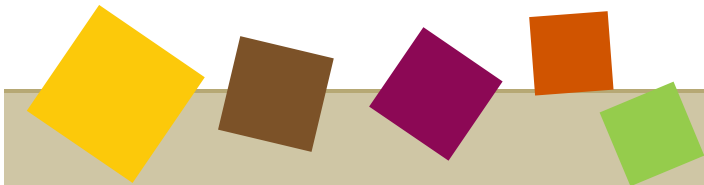
**Bid on action**

Preferences for type of  
agri-environmental auction

Farmers are averse to payments which reward equally

- unequal contribution to ES
- unequal compliance costs

Farmers accept to face more competition provided they gain flexibility



- Investigate better the link between improved practices and resulting environmental impact: how to address issues of non linearity?
  - Allow joint bidding?
  - Provide agglomeration bonus?
  - Organize combinatorial auctions to exploit complementarities
- Provide more effective incentives to control compliance and improve environmental outcomes: combinations of input-based and outcome-based bids?



### Be innovative in the design of auctions

- unexplored alleys in auction theory
  - test bidding behaviour with lab experiments
  - test land user behaviour with framed « field » experiments
- Ideally, run pilot auctions: not so easily done in Europe due to European rules (despite Article 39 of the RDR promoting competitive bidding)

*Thank you for your attention*

