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Peatland Regeneration: Practice and Prospects

Symposium organised as part of the Behavioural Change in Hill and Upland Farming (BeChuf) project (DAERA: E&I 21/2/03)

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Farmers' Preferences for Results-Based Peatland Regeneration Scheme Design: Outcome and Impact

Dr Simone Angioloni
(ERB-AFBI)

Presentation Outline

- Research gap

- Methodology

- Results

- Policy simulations

- Conclusions

Research Gap

- For land-based schemes, farmers' participation extends beyond enrolled land

- Triggers a series of minor adjustments that involve the entire farming management system

- Can have a substantial impact for the environment and therefore for policy design

- No study has considered the complex relationship between AES participation, amount of enrolled farmland in the AES, and changes in farming management practices induced by this participation

Methodology: experimental design

- What: result-based AES for peatland regeneration

- How: a discrete choice experiment

Attribute	Description
Moss coverage	The percentage of moss coverage necessary to receive the payment.
Monitor	Monitoring and reporting the outcome.
Initial capital works	Expenses and direction of the initial capital works for water retention.
Duration	Years of the AES agreement duration.
Payment	Payment per acre per year received by the farmer if the outcome is achieved (British sterling).

How a choice card looks like?

	Programme A	Programme B	No participation
Moss coverage at each annual assessment	At least 15%	At least 30%	
Assesses and reports the moss coverage	The farmer	An external auditor	
Initial water retention capital works	Farmer engages a contractor	DAERA engages a contractor	
Agreement duration	10 years	20 years	
Annual payment per acre you receive	£100	£300	
Please, check one only	☐	☐	☐

If they selected one of the two alternatives (A or B) of the AES, we asked additional questions

What did we ask farmers?

- How much farmland they would like to enrol the AES

- Will entering scheme change the way they farm

  - If they respond yes, we asked:

    - Are you going to sell some livestock? If so, how many head by species?

    - Are you going to rent in additional farmland to cope with this? If so, how many Ha?

    - Are you going to purchase more animal feed/fertiliser? If so, annual expenditure?

Results: 1) Decision to participate in the AES

Attribute	Effect
Moss coverage (15%; 30%)	Very strong negative
Monitoring moss coverage (on the farmer or on expert)	Very strong negative
Initial capital works (on the farmer or contractor)	Strong negative
Duration of the contract (in decades: 10, 20, 30)	Very strong negative
Payment per acre per year (£)	Very strong positive
No participation	Weak negative
No participation * EFS_IN_NOW	No effect
No participation * PEST_FERT_BAD	Very strong positive
No participation * RISK_TAKER	Very strong positive

Results 2: Decision on how much farmland to enroll

Share of enrolled farmland

Share of peatland	Very strong positive
Share of improved farmland	Very strong negative
Payment per acre per year (£)	Very strong positive
Moss coverage (%)	No effect
Monitoring moss coverage	No effect
Initial capital works	No effect
Duration of the contract (in decades)	No effect
EFS_IN_NOW	No effect
RISK_TAKER	Very strong negative

Results 3: Change of farming practices due to AES participation

Farmers changing farming practices due to AES participation

28.45%

71.55%
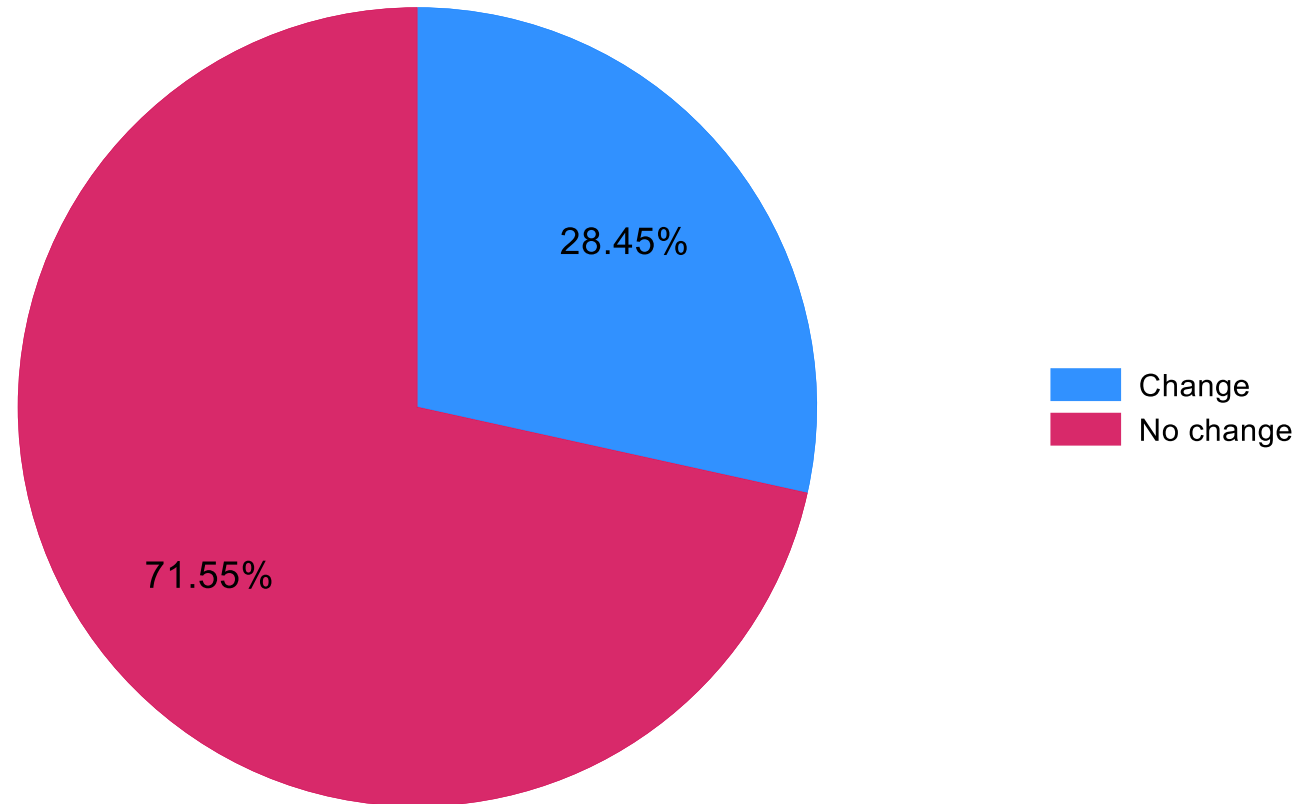
Change
No change

Results 3: What to change
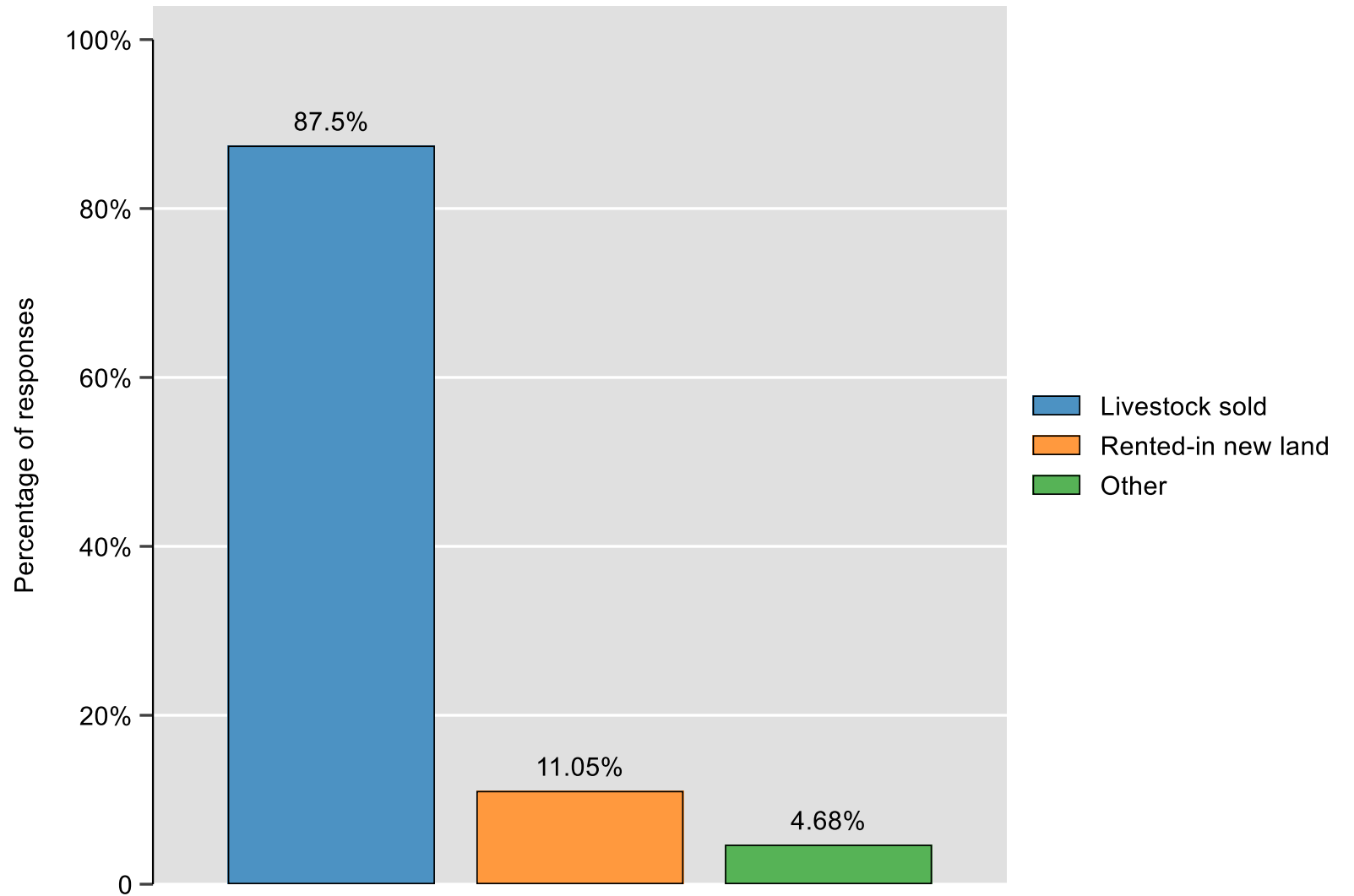
Results 3: Decision to sell/not sell livestock

Animal feed cost (£ per CELU)	Very strong negative
Payment per acre per year (£)	Very strong positive
Moss coverage (%)	No effect
Monitoring moss coverage	No effect
Initial capital works	No effect
Duration of the contract (in decades)	No effect
EFS_IN_NOW	Very strong negative
RISK_TAKER	No effect

Results 4: Decision on livestock heads sold

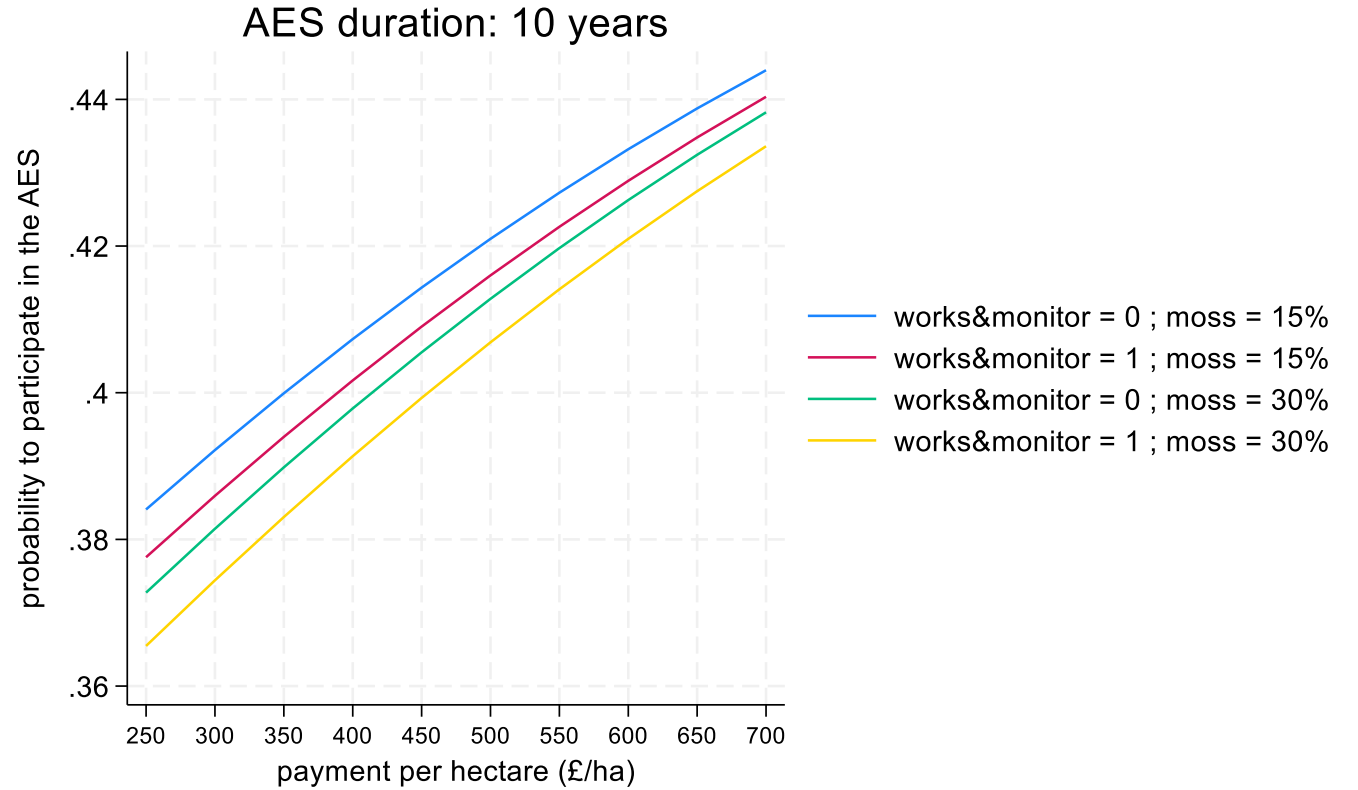| % livestock units sold (CELUs)	
Animal feed cost (£ per CELU)	Very strong negative
Payment per acre per year (£)	Strong positive
Moss coverage (%)	Strong negative
Monitoring moss coverage	No effect
Initial capital works	No effect
Duration of the contract (in decades)	No effect
RISK_TAKER	Strong negative

Policy simulations

- What's about participation rates?

- What's about the total amount of farmland enrolled?

- What's about the total amount of livestock sold?

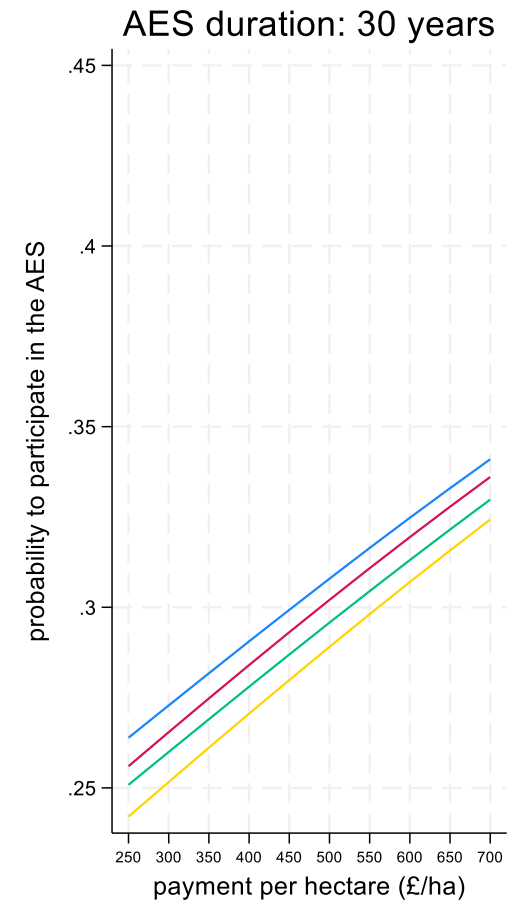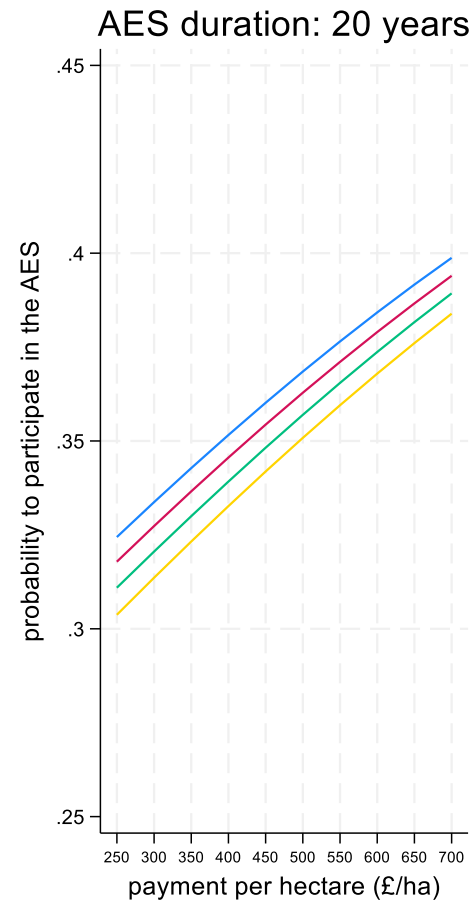- What's about emission reduction?

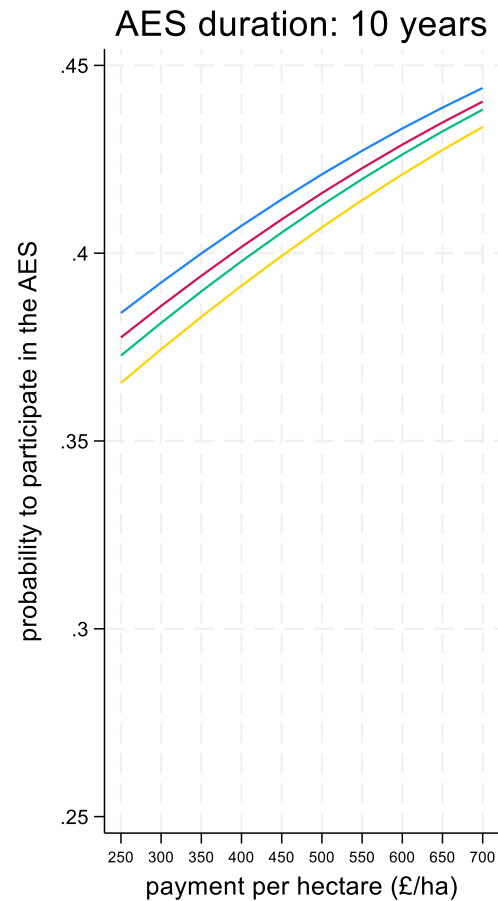**We can use the model results to make predictions and see how these change by AES design**
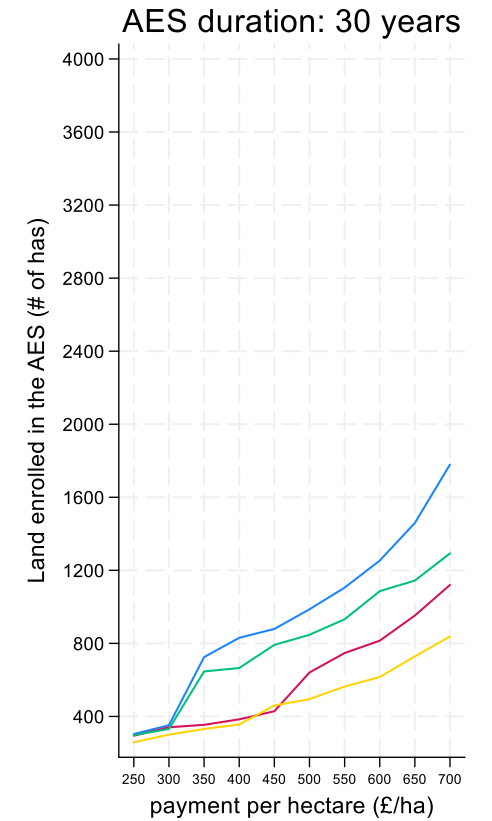
Predictions 1: Participation rates

AES duration: 10 years

works&monitor = 0 ; moss = 15%
works&monitor = 1 ; moss = 15%
works&monitor = 0 ; moss = 30%
works&monitor = 1 ; moss = 30%

probability to participate in the AES

payment per hectare (£/ha)

Predictions 1: participation rates by duration

Predictions 2: Farmland enrolled
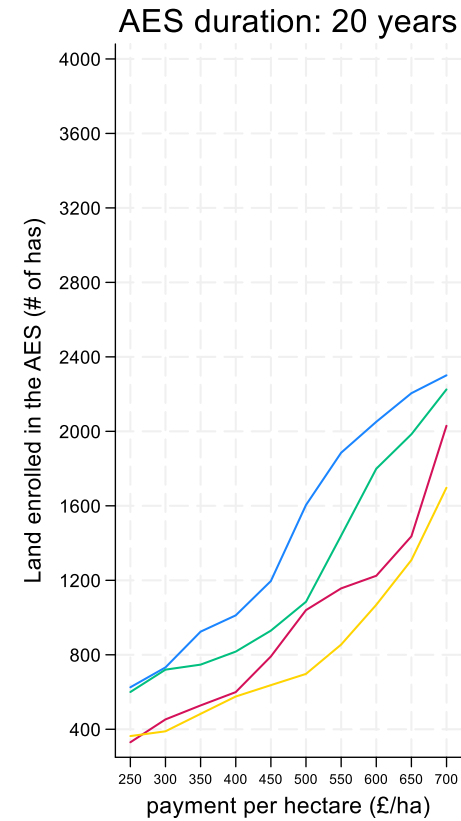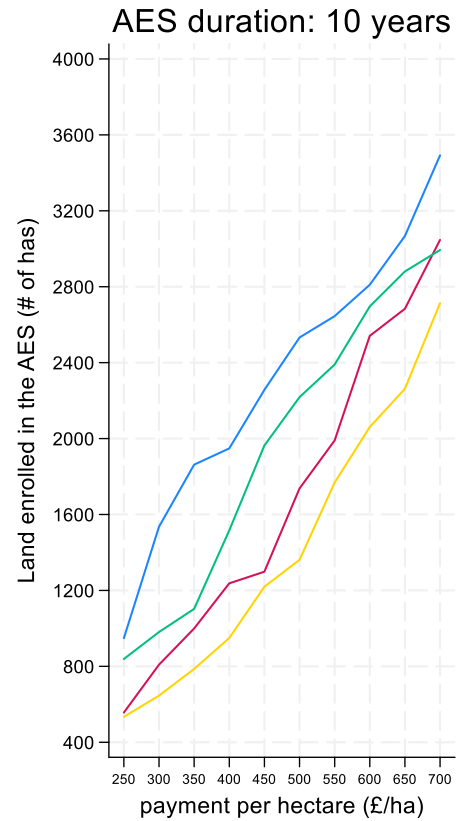
AES duration: 10 years

AES duration: 20 years

AES duration: 30 years

works&monitor = 0 ; moss = 15%
works&monitor = 1 ; moss = 15%
works&monitor = 0 ; moss = 30%
works&monitor = 1 ; moss = 30%

Predictions 3: Sale of livestock

AES duration: 10 years — AES duration: 20 years — AES duration: 30 years

Number of livestock units sold (CELUs) vs payment per hectare (£/ha)
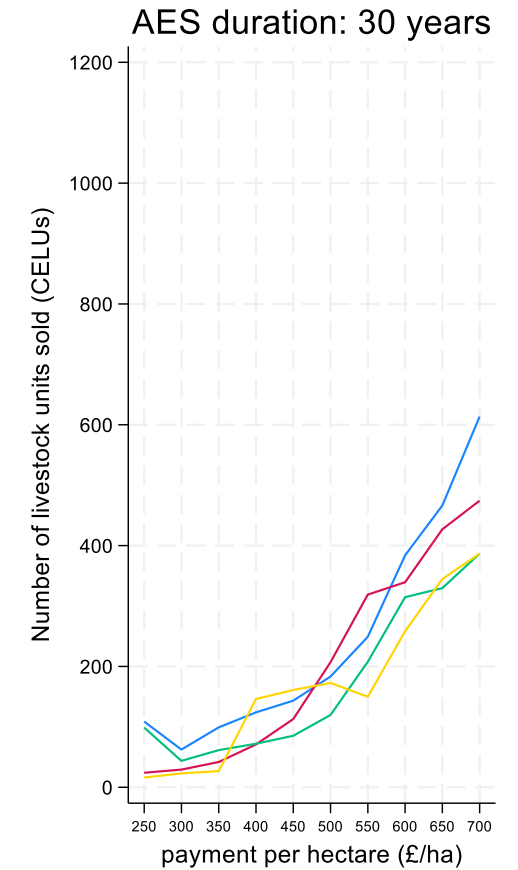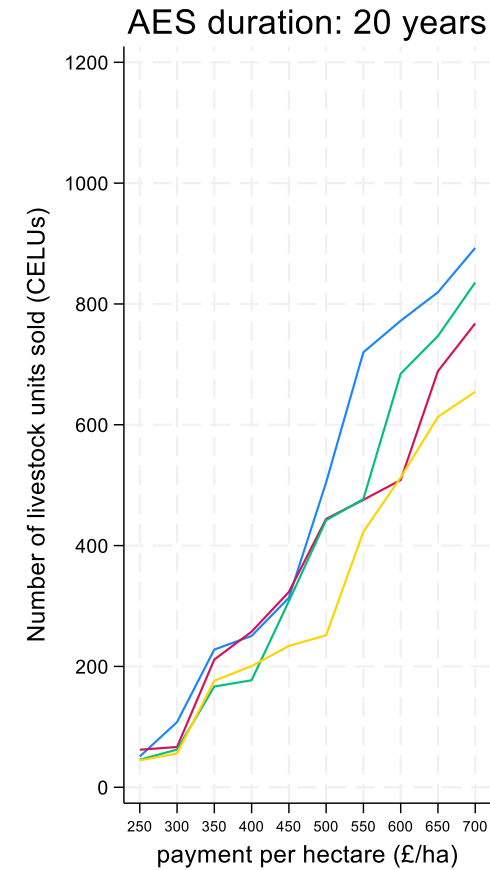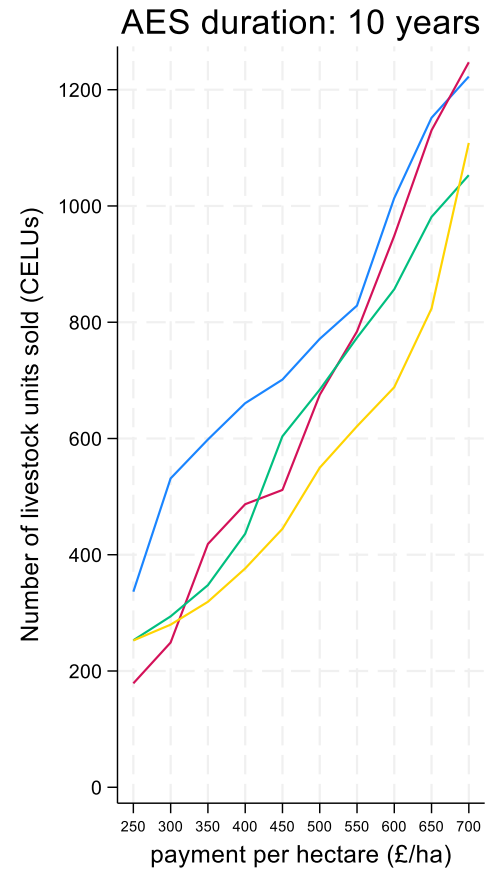
works&monitor = 0 ; moss = 15%
works&monitor = 1 ; moss = 15%
works&monitor = 0 ; moss = 30%
works&monitor = 1 ; moss = 30%

Predictions 4: emission reduction

Scenario	EF farmland (per ha/year)		EF livestock
	15% moss coverage	*30% moss coverage*	*Per CELU/year*
Baseline	1.32	2.33	1.77
Low livestock - High land impact	1.88	3.39	1.51
High livestock - Low land impact	0.76	1.67	1.96

Predictions 4: Emission reduction *under certainty and no time gap*

Scenario	Emission reduction per Year (tons Co2 eq/year)			
	Farmland	Livestock	Total	% reduction due to livestock
Baseline	2,185	732	2,917	24%
Land high livestock low	3,154	625	3,779	16%
Land low livestock high	1,441	811	2,252	34%

Predictions 4: emission reduction by level of moss coverage of the AES under certainty (baseline scenario)

	AESs 15% moss	AESs 30% moss
Enrolled farmland (Ha)	1,331	1,122
Livestock sold (CELUs)	457	371
Co2 eq change (t)	2,565	3,269
AES budget	£721,259	£617,781
Kg Co2 change/£1	3.56	5.29

Conclusions

- Farmers expressed interest in an AES for peatland regeneration

- Reported high WTAs for more challenging moss coverage to be achieved

- Longer duration of AES substantially reduces participation

- The amount of farmland enrolled is driven only by the payment

- The number of livestock units sold is affected by moss coverage (low or high)

- AES participation triggers a series of adjustments to the farming system that impact the environment, the budget, that must be considered for effective policy design

THANK YOU: QUESTIONS?

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