



Universiteit Leiden

# Benchmarking as a tool for improving farmers performances

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# Introduction

- Within Environmental Management **multi-actor** related problems are most persistent: consumers, households, farmers...
- Example: decrease of biodiversity on farmland in Europe
  - Main tool: Agri-Environment Schemes (AES) within Common Agricultural Policy
  - AES: measures farmers can take to protect environment, landscape or biodiversity
  - EU AES budget 2007-2013: 34 billion euro (incl. nat. co-financing)
- However, in EU still decrease of farmland biodiversity:
  - Meadow bird populations
  - Plant species richness in ditch banks
  - And: only common species seem to appear (field margins)

-> 'mixed ecological impacts' of AES

-> *euro's ≠ biodiversity*



# We should do better...

- Natural science: improvements: landscape setting, measures...
- But also other issues relevant: Some farmers do better than others...
- **'Farmer'** is the key:
  - *'eye of the farmer'...* (Swagemakers 2008)
  - *Farmland biodiversity – in the Hands and Minds of Farmers...* (Ahnström 2009)
- Can we use **variation** in performance as a starting point for improving nature conservation on farmland?
- *Incentives*: better use of **motivation / commitment** of farmers:
  - *Using commitment to improve environmental quality* (Lokhorst 2009)



# Two questions

- Is there a **correlation** between farmers motivation and biodiversity?
- Can we use motivation **to change** farmers behavior to improve performances?

Set up:

- 85 arable farms in the province Zeeland, NL
  - Behavior variables: quantitative questionnaires
  - Ecological variables: field measurements



# Question 1

- Is there a correlation between farmers motivation and biodiversity?
- Case study: ecological impacts of **field margins = subsidized AES**
  - new created / sown ‘fauna margins’
  - ‘entry level’ UK

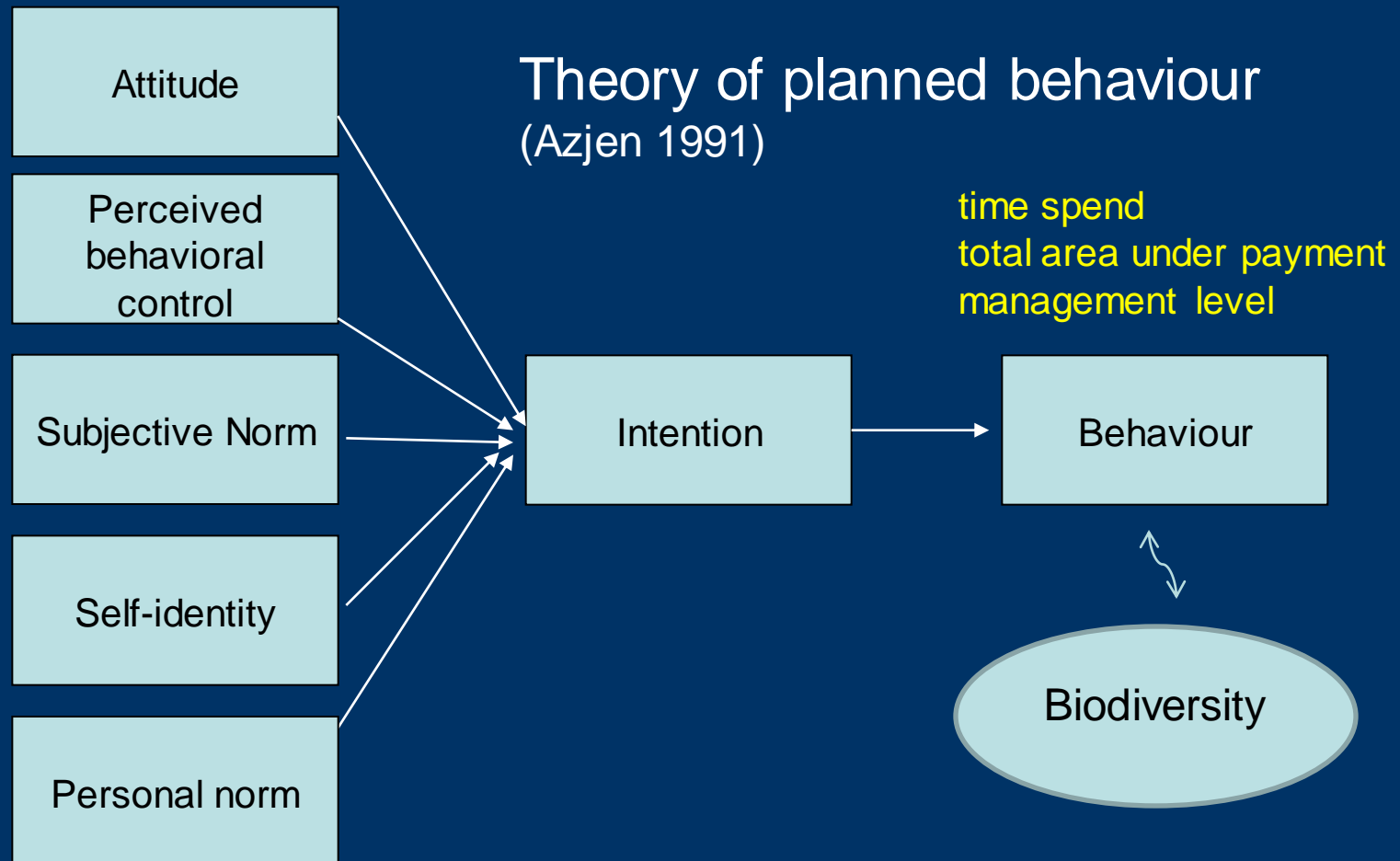


# Correlation farmers motivation – ecological data

- Dependent variables field margins
  - No. of plant species
  - No. of invertebrate species groups
  - Abundance of predators
- Independent variables
  - Age and education of farmer
  - Motivation factors...



# Farmers motivation Behavioral model





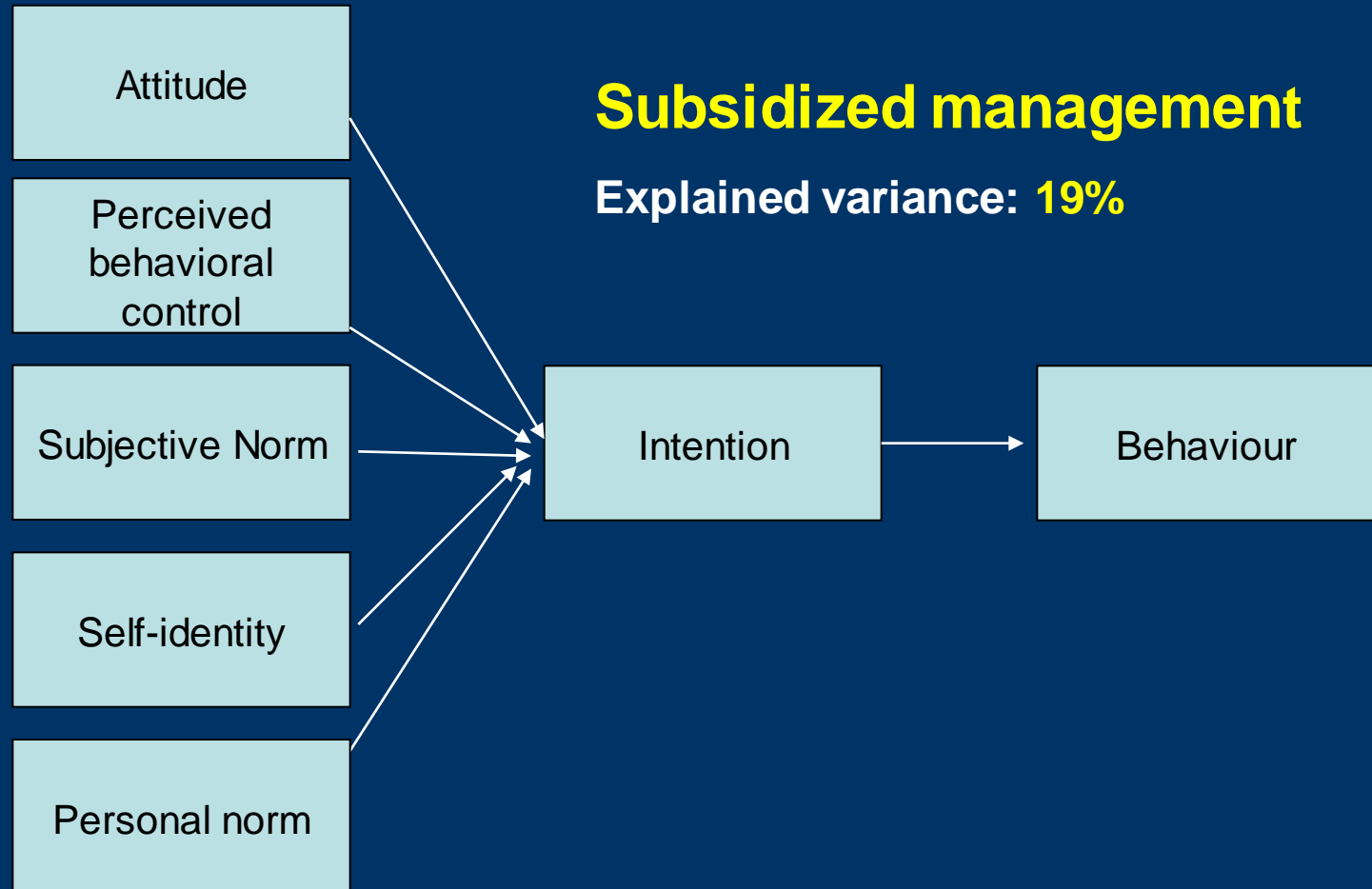
# Farmers motivation: results correlation with biodiversity (HGMLM)

- No. of plant species:
  - **no** social-behavior factors
- No. of invertebrate groups:
  - **no** social-behavior factors
- Abundance of predators

	sign	Wald stat.	df	p
– Education	+	4.911	1	<b>0.027*</b>



# Motivation: behavioral model





# Conclusions question 1

- The ecological impacts of these specific AES (field margins) are **not correlated** to social-psychological or behavioral differences between farmers
- Education might be of influence
- *This supports the idea that these AES do not make use of the farmers intrinsic motivation to gain better results -> **no commitment***

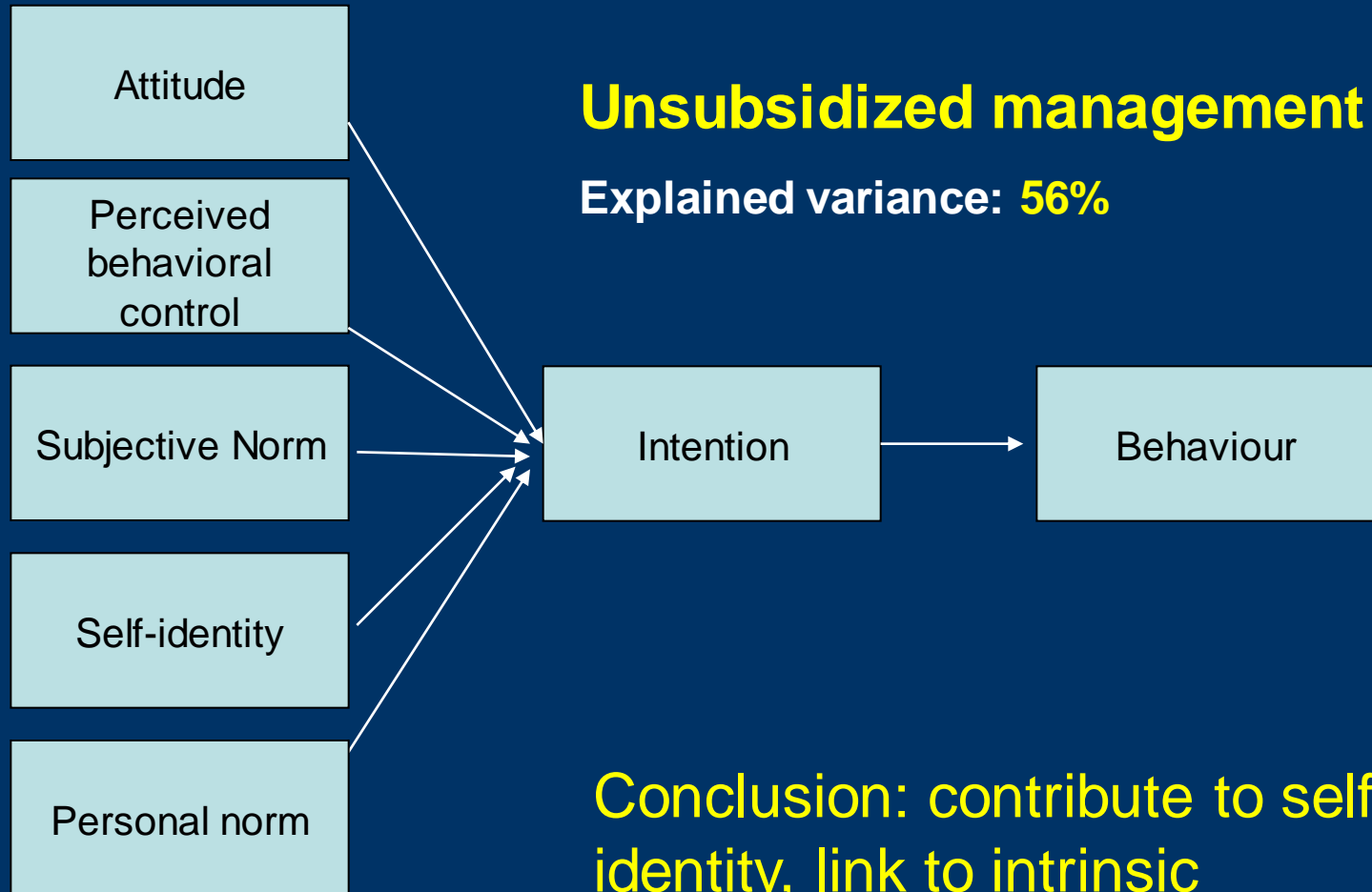


# Subsidized vs. unsubsidized agri-environmental management

- Subsidized AES do not appeal to farmers' motivation (-> *euro's?*)
- What about voluntary agri-environmental management?
  - Same farmer group
  - All kind of voluntary biodiversity management



# Motivation: behavioural model



**Unsubsidized management**

**Explained variance: 56%**

**Conclusion: contribute to self-identity, link to intrinsic motivation -> 'proud farmers'**



## Question 2

- Can we *change* behavior by making use of *feedback and commitment* to improve farmers performances?
- Experiment with farmers (n = 85)
  - Subsidized (field margins) and
  - Unsubsidized habitats



# Social-psychological research

- Intervention study:
  - 1 Control
  - 2 Feedback
  - 3 Feedback & Public commitment
- **Feedback** through benchmarking performance in individual farm reports
- **Public commitment** in a peer group
- Measurement before and after treatment  
weak intervention, one time, one year only



# Individual farm report

## Agrarisch natuurbeheer op uw bedrijf

Een onderzoek en een advies  
over de natuur op het bedrijf van  
**fam. de Boer,**  
Tarwestraat 2 te Akkerhuizen



Opgesteld door het Centrum voor Milieuwetenschappen, Universiteit Leiden



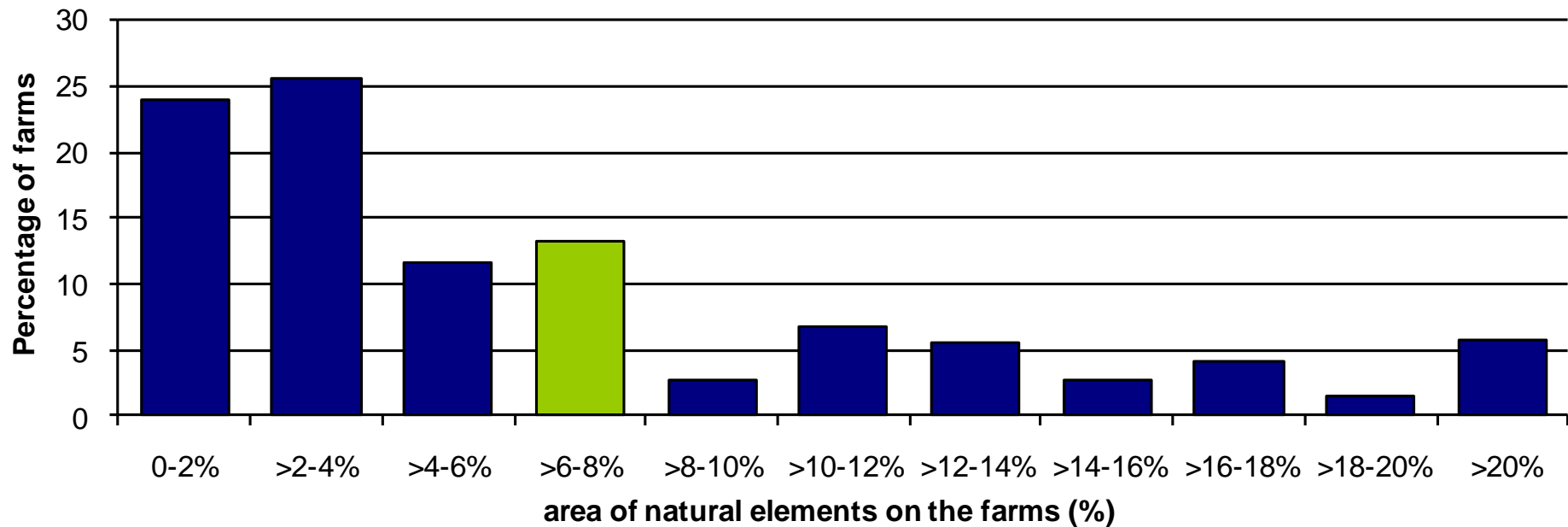
Information about:

- 1 Area/type of natural elements
- 2 Quality of management
- 3 Contribution to conservation of all species groups
- 4 How to improve ...





# Benchmarking performance

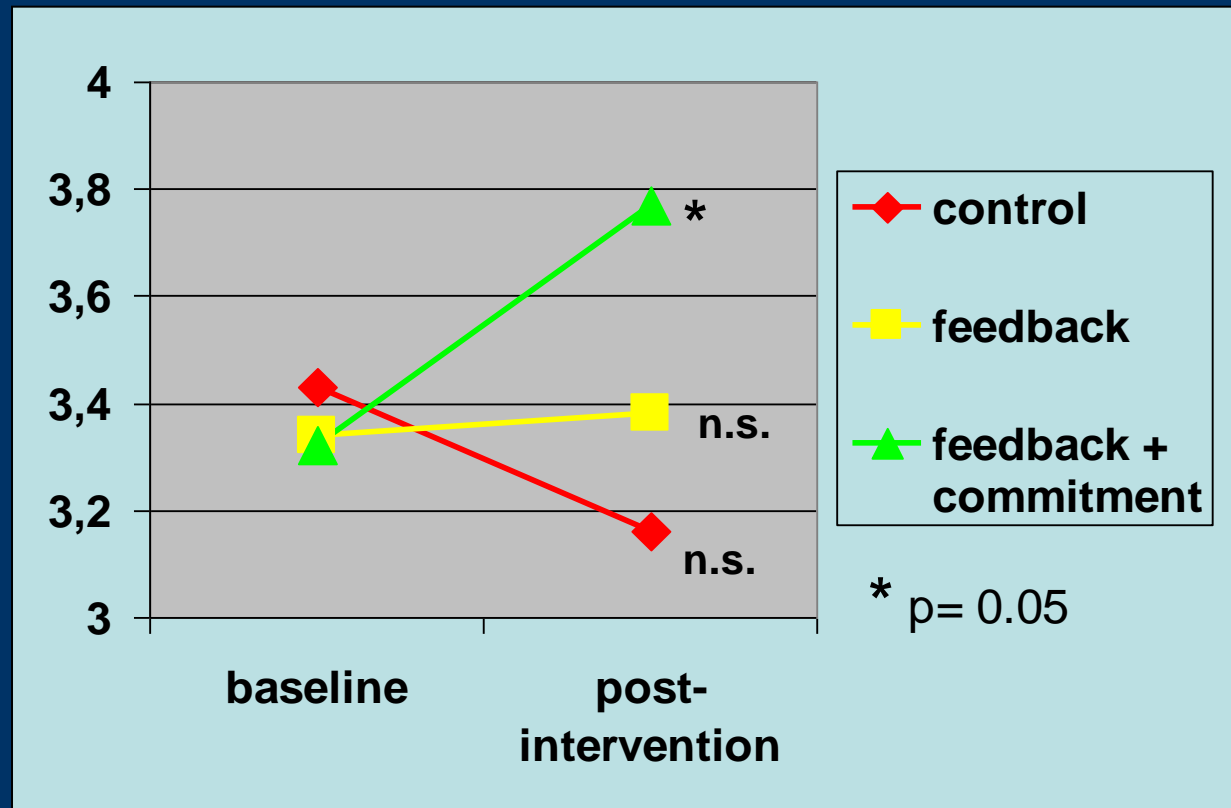


- Own contribution compared to other farmers
- Surface area, management quality, habitat diversity



# Intervention effects results: psychological variables

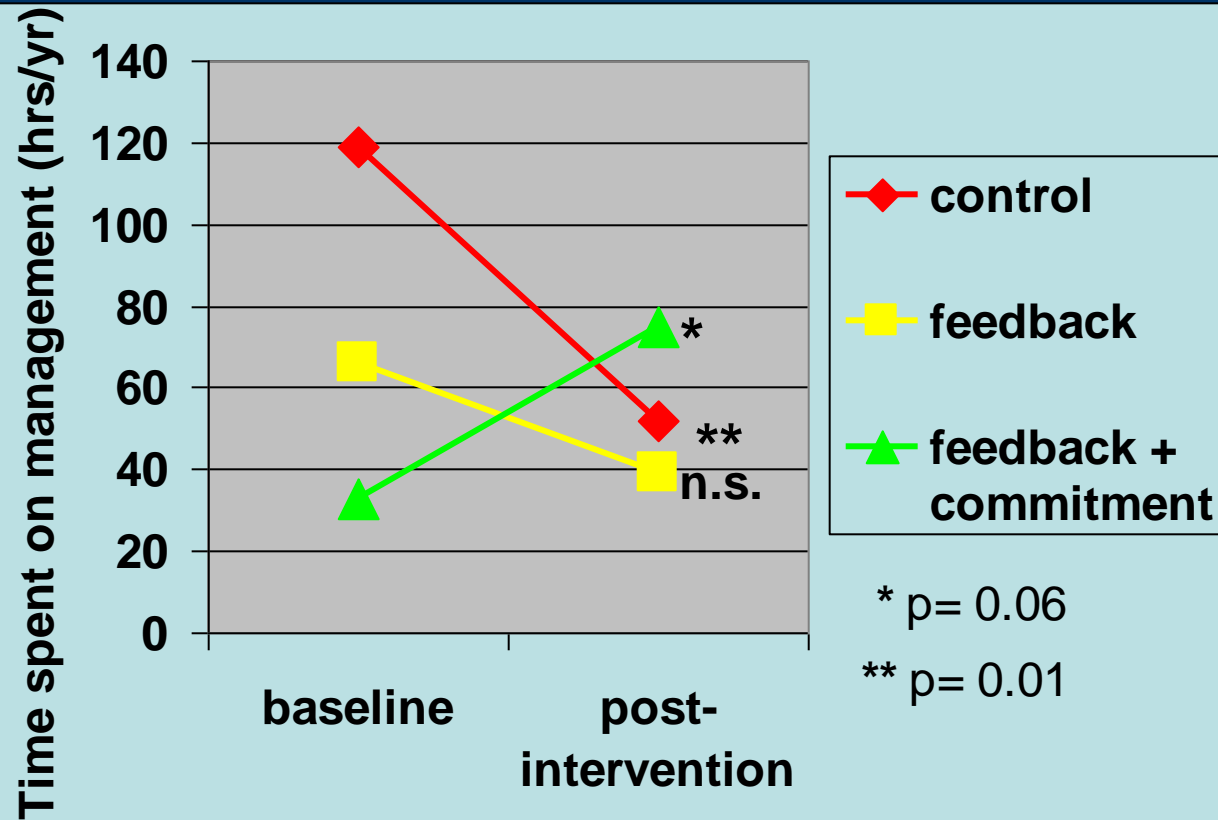
Desire to engage (**intention**) in agri-environmental management (**subsidized and unsubsidized**)





# Intervention effects results: behavioral variables

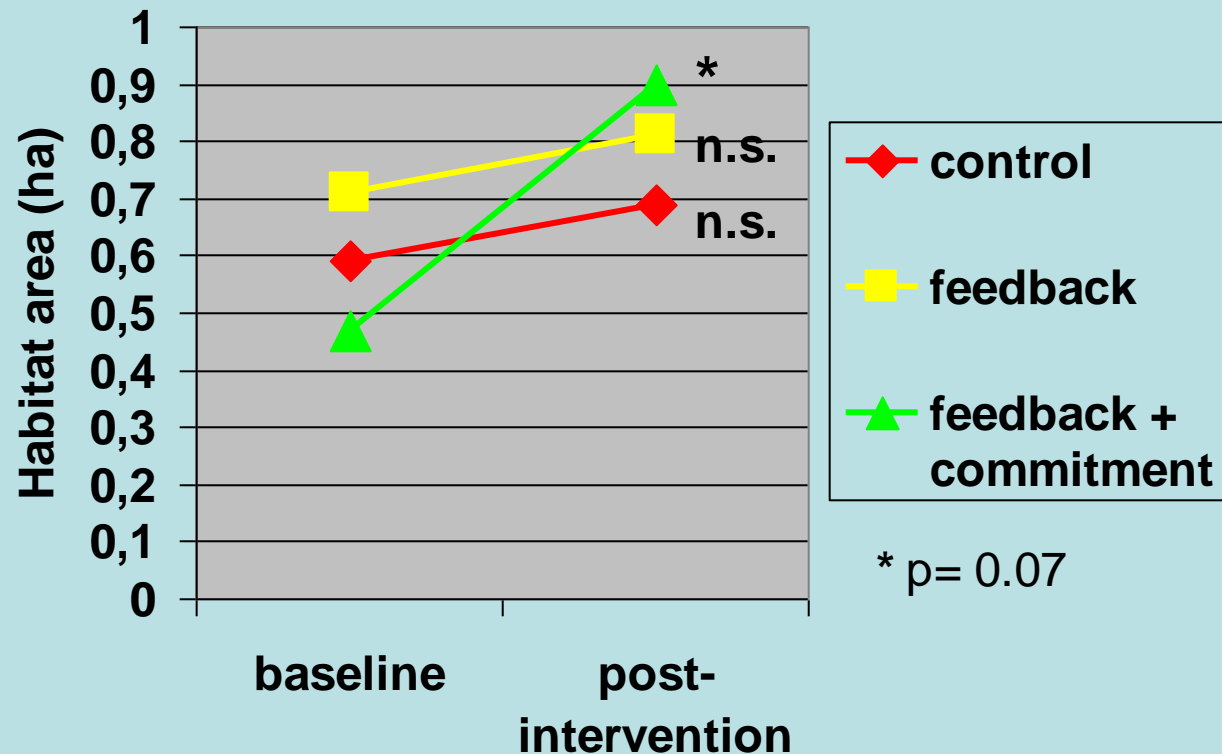
Time spent on **unsubsidized management**





# Intervention effects results: ecological variables

## Area of unsubsidized habitat





# Conclusions about changing (farmers) behavior: incentives

- Benchmarking in combination with social interaction with other farmers might be a suitable tool to change farmers *intention of behavior* (motivation)
- For subsidized AES this will **not** lead to changes in **behavior** (impact biodiversity)
- For unsubsidized management **changes in behavior will occur**
- **Overall:** Behavioral aspects need more scientific attention for sustainable management of farmland biodiversity (and other multi-actor environmental problems as well)



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# Thank you!

Article: De Snoo *et al.*, 2010.  
Aspects of Applied Biology 100: 311-317