

# Role of climate models as tools for climate adaptation

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## Case study: 'Baakse Beek'



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Climate adaptation of a rural area in the Netherlands

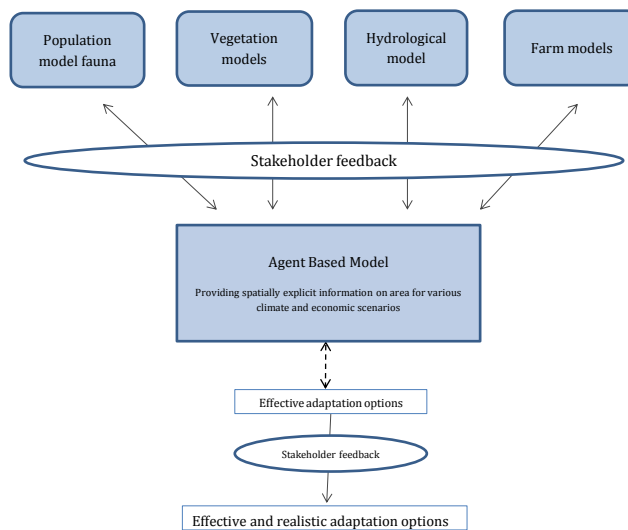
Regional process with stakeholder organizations

- LTO (Farmer Union)
- Province
- Responsible regional Water board
- Nature organisations
- Private estate owners



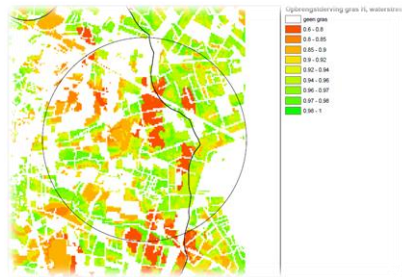
Images: [www.baaksebeek.nl](http://www.baaksebeek.nl)

## Model construction



## Stakeholder meetings

May 2011	Introduction of project, plans
May 2012	Initial presentation of framework models
December 2012	Progress, first output models
January 2014	Final output models, maps and animations



## Objective of research

Understanding the role of models in perspective change of stakeholders

- Was there perspective change among stakeholders?
- What affected this perspective change?
- What was the role of the model?

## Perspective change

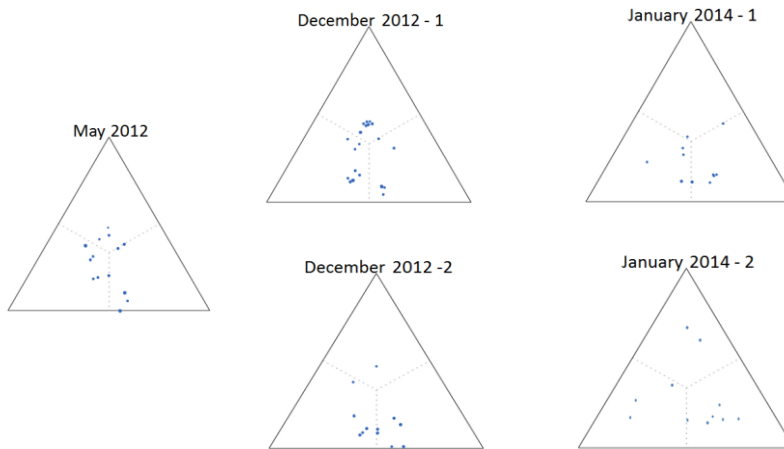
- Instrument to map perspectives of present stakeholders.
- Perspective Scoring Table
- Cultural Theory

Table 1. The four cultural worldviews and their associated assumptions about the world and the role of agriculture. The table is a grid with 4 columns (HIERARCHIST, INDIVIDUALIST, EGALITARIAN, FATALIST) and 4 rows (Value of agriculture in society and landscape, Perception of agricultural challenges related to climate change, Safety/risk, and Incentives to develop solutions for agricultural challenges).

	HIERARCHIST	INDIVIDUALIST	EGALITARIAN	FATALIST
Value of agriculture in society and landscape	Agriculture is a reliable source for demands of the region	Agriculture can help a region to prosper, develop and survive.	Agriculture is part of the cultural identity and landscape of the region	The value of agriculture is determined by external factors.
Perception of agricultural challenges related to climate change	Climate change can result in problems for agriculture. These problems can be managed if policy measures are taken well	Because there will only be a moderate change in climate, there will be no real problem for agriculture. Technological	Regardless of the extent of climate change, agriculture can get in trouble if we don't adapt the way we manage our needs and	We can't foresee what is going to happen, so there is no need to worry about that now.
Safety/risk	Risk should be avoided by management.	Risks are part of the game, we should use it as an incentive to develop new technologies	Risk should be avoided by adjusting to nature: avoid high-risk areas and change to low-risk crops and activities.	Risk is unpredictable and we will have to find out.
Incentives to develop solutions for agricultural challenges	Regulation based on expert and governmental knowledge. Subsidies and quota are examples	Market and privatisation give incentives to find solutions.	Open, participatory planning processes give possibility to find the best solutions.	What we need at that moment determines our incentive. There is not one best way to find a solution.

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World view	Value of agriculture in society and landscape	Agriculture is a reliable source for demands of the region	Agriculture can help a region to prosper, develop and survive.	Agriculture is part of the cultural identity and landscape of the region	The value of agriculture is determined by external factors.
Management context	Safety/risk	Risk should be avoided by management.	Risks are part of the game, we should use it as an incentive to develop new technologies	Risk should be avoided by adjusting to nature: avoid high-risk areas and change to low-risk crops and activities.	Risk is unpredictable and we will have to find out.
	Trust in technological solution for agricultural problems	Use technology where it can benefit us, and only if the technological option is well researched by experts.	Large trust, technology can help us optimize the use of resources, and optimize safety, profit and yield.	Technology is only an option when it is aimed at sustainability or reducing risk.	Technology can be good or bad. If we can use it, we should. The consequences in the long term cannot be predicted.
	Responsibility	The key actors are the national and regional water boards/governments and experts	Those who stakeholders as well as the market determine management. Governmental control is not necessary.	Stakeholders and the meso-level of water management have best knowledge of what is needed.	We all need to do what we can, and what serves ourselves and our dearest.
Management process	Incentives to develop solutions for agricultural challenges	Regulation based on expert and governmental knowledge. Subsidies and quota are examples	Market and privatisation give incentives to find solutions.	Open, participatory planning processes give possibility to find the best solutions.	What we need at that moment determines our incentive. There is not one best way to find a solution.

## Perspective change



## Role of the models in perspective change

Discussions following presented model (result)s

Theme group discussions

- Qualitative analysis
- Coding of transcribed discussions

**Plenary discussions**

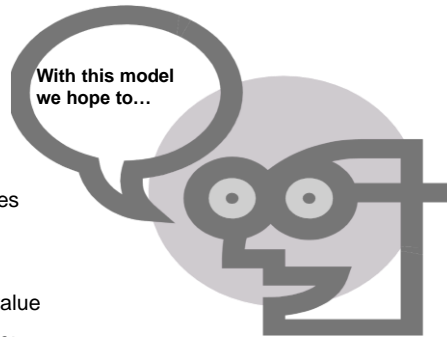
Interaction	May 2012	December 2012	January 2014
Clarification question	14	8	0
Operational aspects of model	35	24	3
Suggestion for the model development	2	9	1
Interpretation model outcomes	13	21	7
Sharing local knowledge	8	14	6
Question to model	7	21	1
Goals and objectives for Baakse Beek area	1	0	0
Requesting stakeholder interaction	5	5	6
Role of the model	10	15	2
Adaptation measures	0	0	3
Question to stakeholders	0	3	2
Climate change	3	2	2
About assignment	-	-	-

**Workshops January 2014**

Type of interaction	Frequency
Clarification question	2
Operational aspects of model	0
Suggestion for the model development	0
Interpretation model outcomes	52
Sharing local knowledge	101
Question to model	2
Goals and objectives for Baakse Beek	59
Requesting stakeholder interaction	20
Role of the model	0
Adaptation measures	143
Question to stakeholders	0
Climate change	3
About assignment	19

## Role of the models

- Explore what happens if...
- Knowledge of the natural system
- Know what good adaptation measures are
- Create win-win situations
- Make a translation from function to value
- Make a plan with no-regret guarantee: what should go where?
- A user-friendly version that can provide answers in the process after CARE



## Interviews

- Model outcomes were trusted
- Outcomes confirmed previous knowledge/data
- No missing factors



“What was the role of the models?”

- Confirmation of plans and ideas
- Base for discussion with all parties
- Starting point for making a plan
- The start of a process

## Conclusions

- We observed a perspective change among stakeholders
- The models were subject of discussion from a technical viewpoint in plenary meetings
- The models functioned as a safe and neutral platform, and a springboard for local knowledge in the workshops

However...

Discrepancy between:

Role of the models as intended

vs.

Role of the models as analysed

vs.

Role of the models as preferred by stakeholders



## How do models function as tools for finding a strategy for climate adaptation?

### In setup

Plenary meetings	Exploration tool for the Baakse Beek area
Workshops	Discussion platform to explore adaptation options for the Baakse Beek area

### From qualitative analysis

Plenary meetings	Understanding of the models, technical aspects and assumptions
Workshops	Discussion platform for local knowledge

### According to Stakeholders

Provide us with answers, win-win and no regret.

## How to improve synergy between science and policy?

- Both provide knowledge for climate adaptation measures
  - Model as neutral platform for discussion
  - Reflection on goals and objectives triggered, use of local knowledge facilitated.
- 
- Discussions based on local knowledge **and** models.
  - Continue cooperation after the models are up and running
  - Key individual stakeholders to remain active throughout the process

**Thank you!**

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