

*Climate proofing landscapes in a complex world:  
bringing science into the competing claims arena*

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Take home message

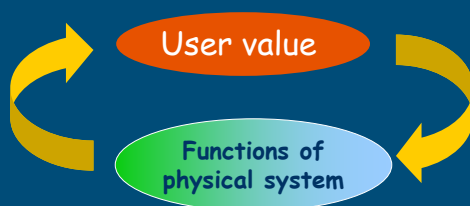
To be relevant for building a sustainable future, science for climate change adaptation should:

- *Link physical landscapes to human values*
- *Link large scale and local scale planning*



## The local scale: where it is happening

- Linking physical to human systems



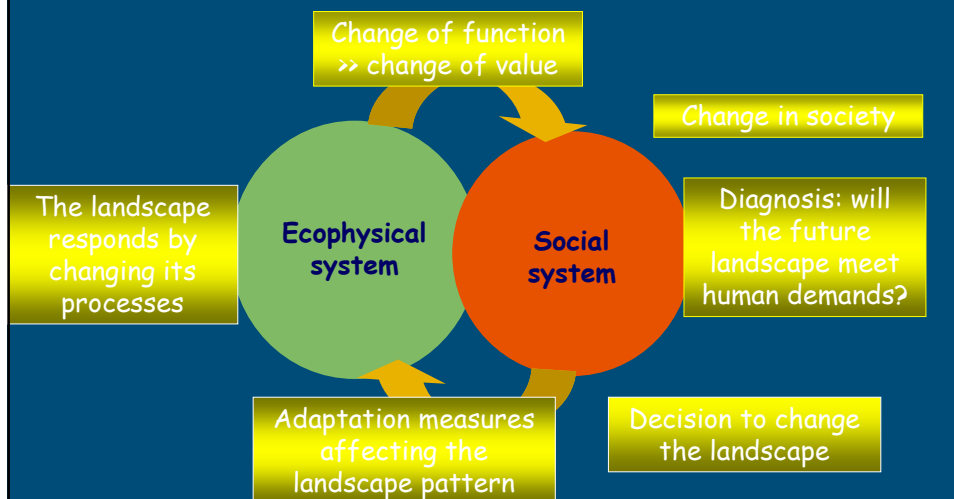
Humans have always adapted their landscapes  
in response to changed conditions  
to prevent loss, to gain values

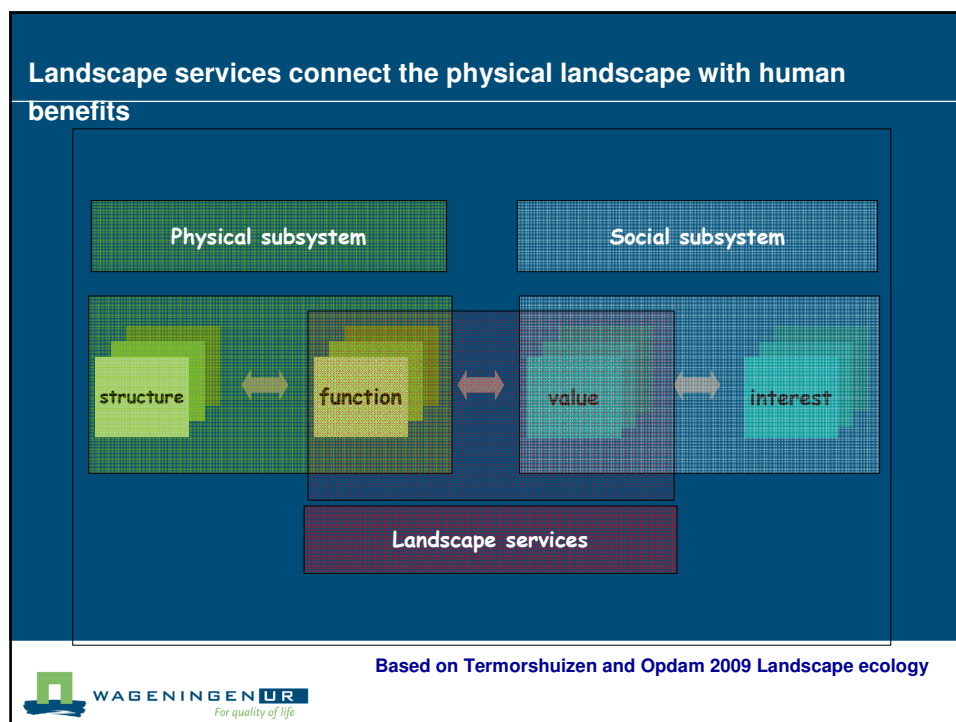
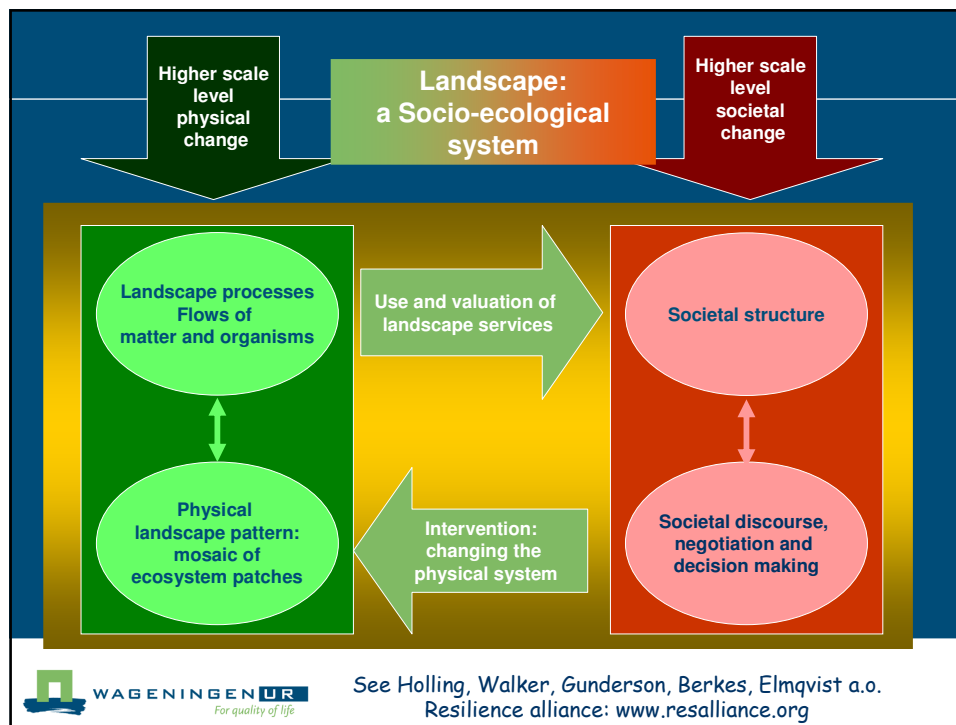


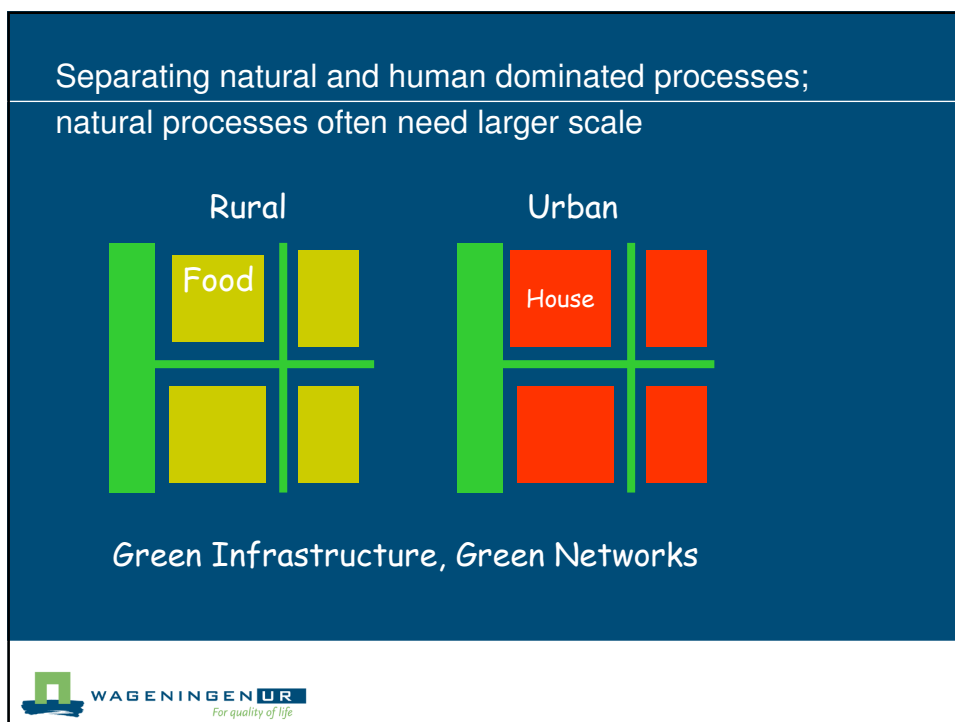
## Adapting landscapes is mostly about HUMANS !

- A reason: expected loss of value, wish to increase value
- A decision: to do something (feel of urgency!)
- A physical change: humans restructure the landscape pattern
- A perspective: things will get better
- A societal change: humans use the landscape differently

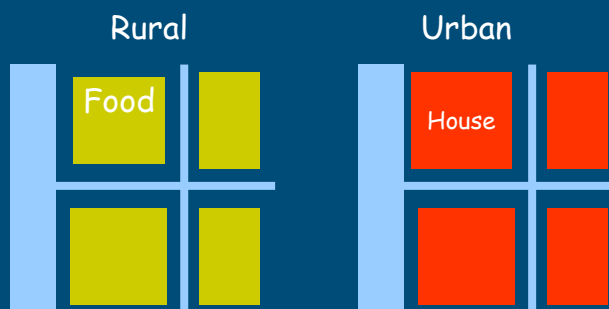
## Landscape adaptation as a cyclic process





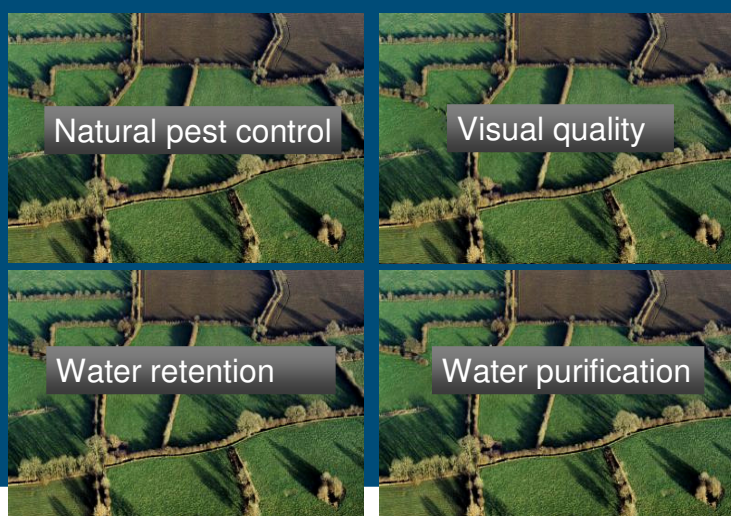


Separating natural and human dominated processes;  
natural processes often need larger scale

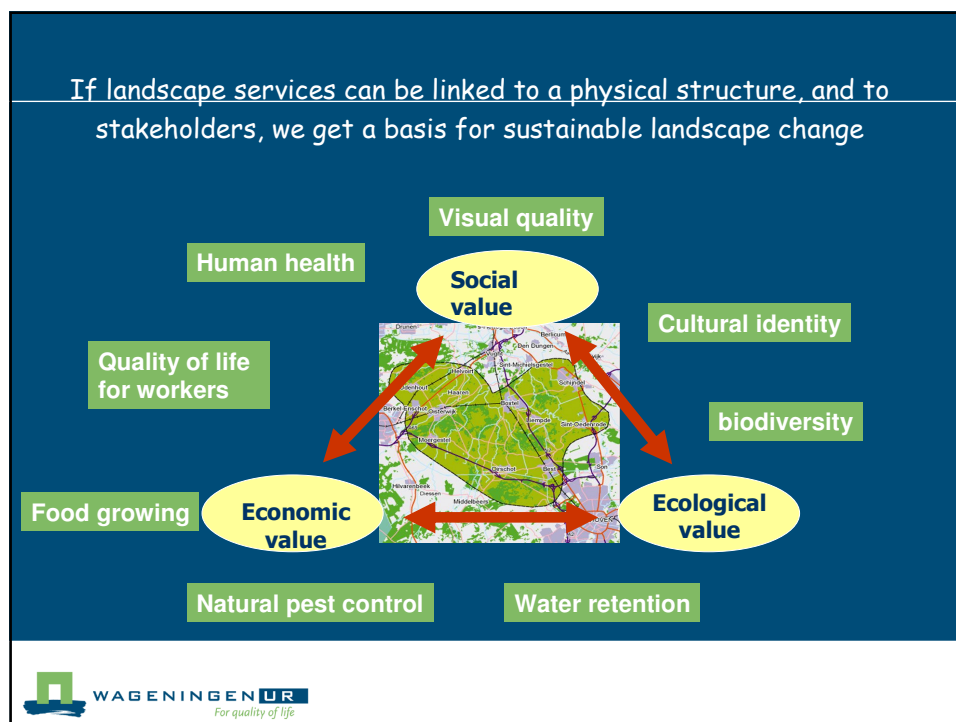
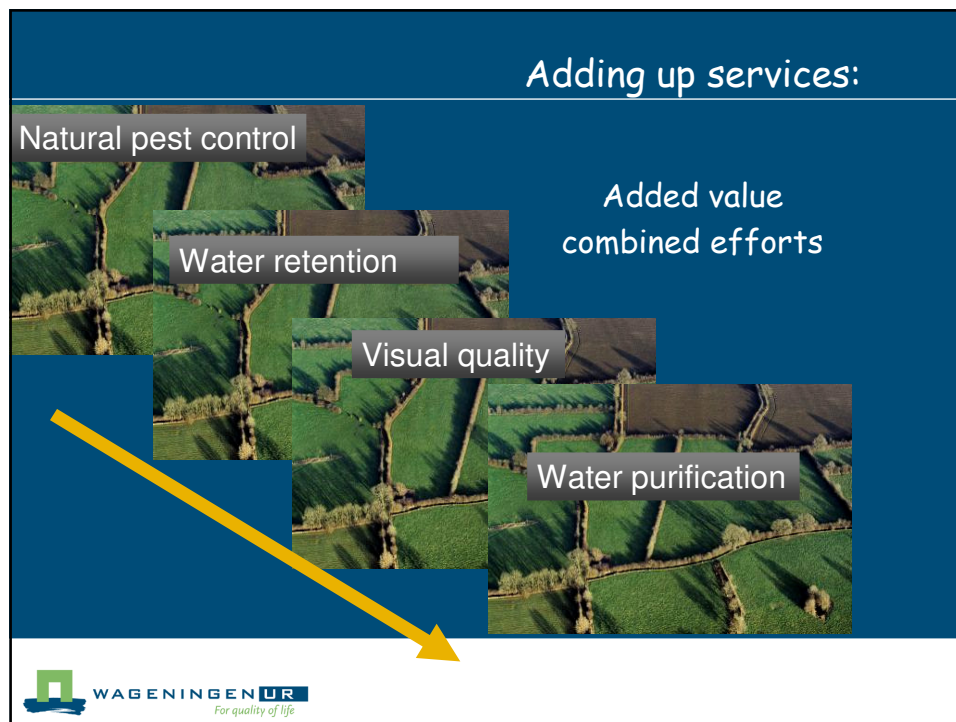


Blue Infrastructure, Blue Networks

Green infrastructure as a planning concept:  
one structure, many services








### Building methods based on landscape services to inform and facilitate local communities in sustainable landscape development




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For quality of life

Steingröver et al. 2010 Landscape ecology

### Cost-benefit ratio



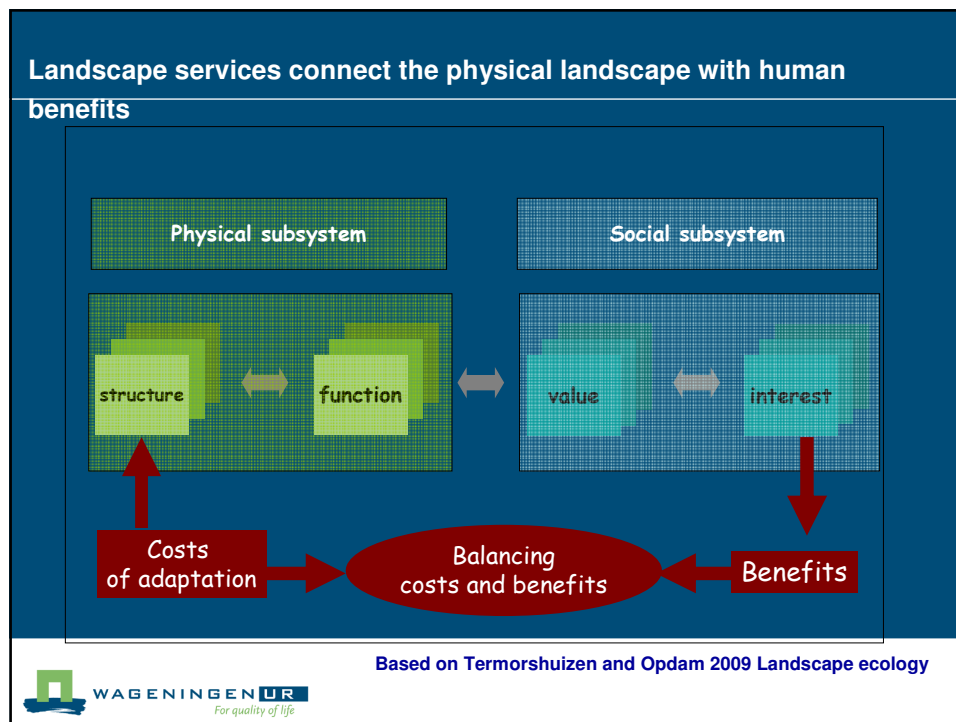
	Optimal situation biological control	Investment in public space only
<b>Costs</b>	64,8	25,6
<b>Benefits</b>	102,4	50,8
<b>Balance</b>	46,5	25,7



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## Example: biodiversity

Climate change:  
shifting climate zones, shifting species ranges



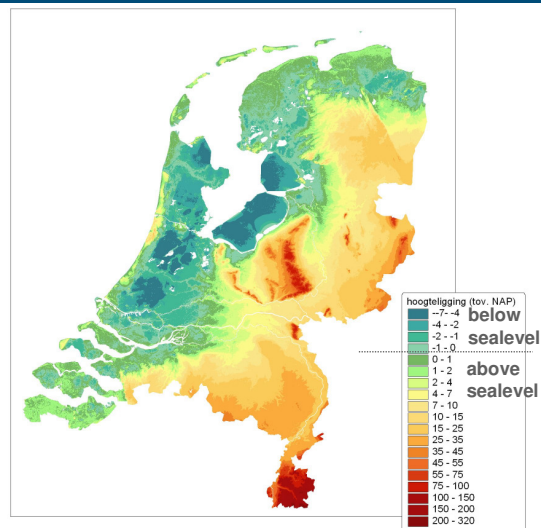
Increased weather extremes:  
increased species dynamics at regional scales



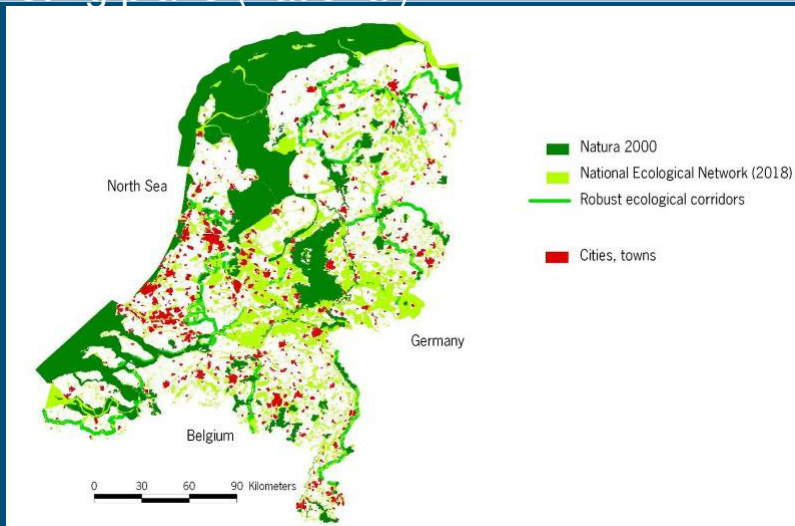
Changes in local ecosystem function  
(affecting landscape services)

## the Netherlands: altitude above sea level

- A managed Delta
  - water management
  - fragmentation
- Climate impact
  - drought & inundation
  - range shifts

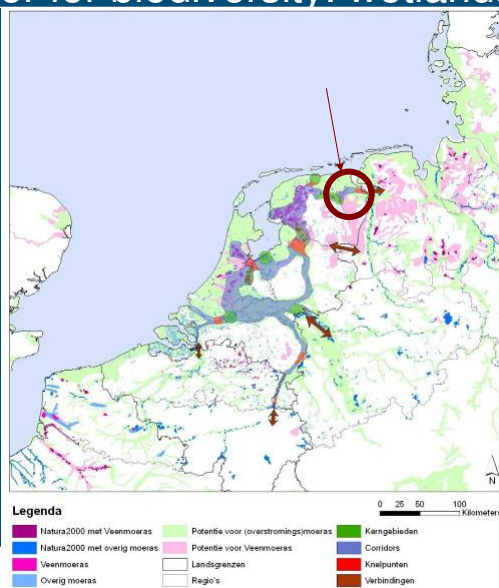


## Existing plans (national)



## Climate corridor for biodiversity: wetlands

Vonk et al. 2010



## Regional case study: Groningen

### ■ Including climate change adaptation in Provincial Environmental Plan

- Nature conservation
- Water management
- Agriculture
- Housing



## Approach

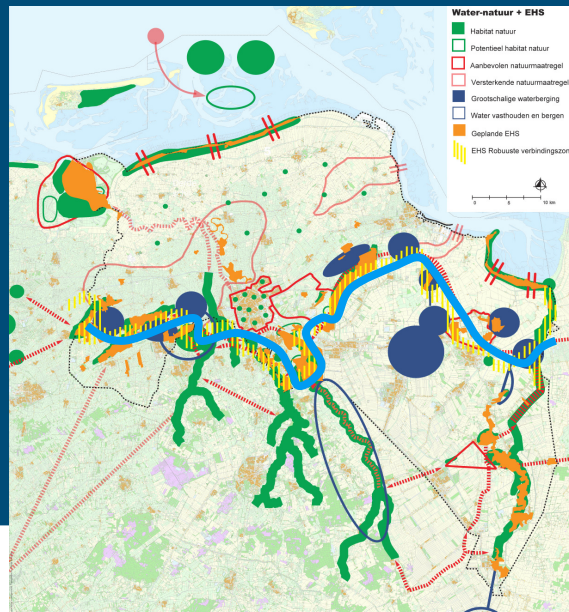
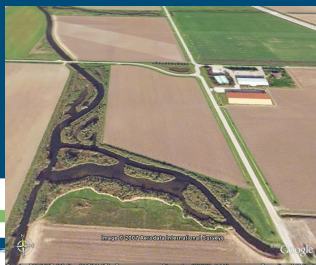
### ■ Cooperation with regional stakeholders

- Targets nature and water adaptation
- Integrated alternatives
- Selection alternatives

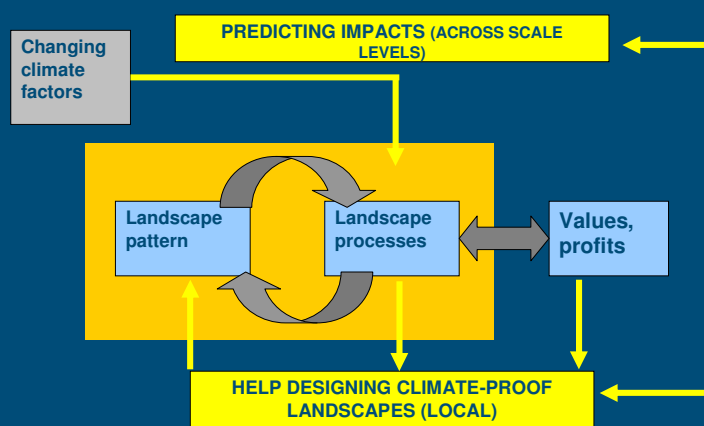


## Regional adaptation plan contributes to international corridor

....and may  
coordinate local  
action



## Challenges to science for adaptation





Thank you

