

## Towards an Ecosystem Services database

Quantifying and structuring ES Provision based on the Cascade model

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Photos: Alexander van Oudenhoven

## Why am I not at Working Group 3

- “My working group” – on indicators
- To select indicators for ES quantification ...
- ... apply a framework, a logical “flow” ..
- .. that makes me, and others understand:
  - How ES are provided, what they are
  - How provision precedes valuation
  - How ES can be embedded in real-life issues



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## Starting point

Explanations by

- Roy Haines-Young (ALTER-Net Summer School 2010) – “The story of ES provision”
- James Aronson (workshop Baviaanskloof, South Africa) – “A waterfall, trickling down”

My PhD:

- Linking land management & ES provision
  - Biophysical terms, measured impacts of human influence



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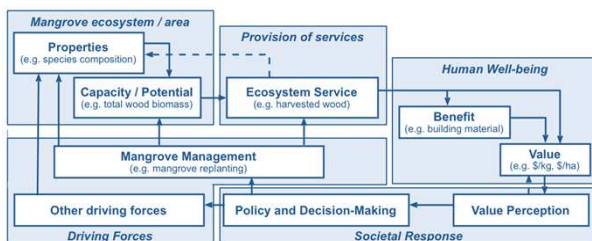
## Different case studies, different purposes, but same framework

- “Het Groene Woud”, The Netherlands
  - Perspective: conceptual / theoretical
- Baviaanskloof & Kouga catchments, RSA
  - Conceptual, practical (for me, in light of data scarcity)
  - Communication / advocacy for the research team
- (Former) mangrove areas, Java, Indonesia
  - Mangrove Capital: Communicating values of mangroves
  - But do we really have to emphasize (economic) values?
  - Cascade helped improve communication in project



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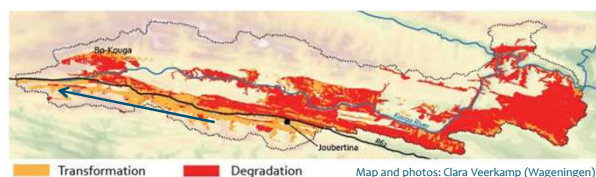
## Framework (this case: Mangrove Capital)



Adapted from Van Oudenhoven et al. 2012, Ecol. Ind.  
 Inspired by De Groot et al. 2010, Haines-Young et al. 2011 and Kienast et al. 2010



## Kouga catchment, South Africa



Map and photos: Clara Veerkamp (Wageningen)

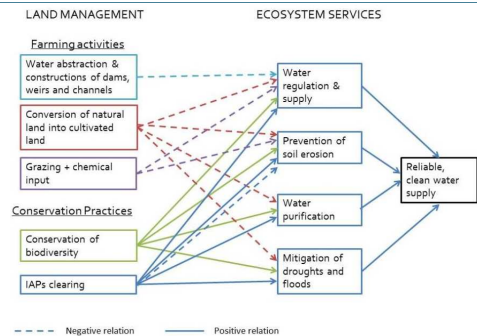


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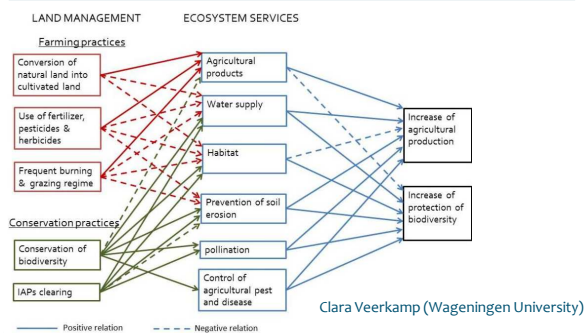
## Main issues in the Kouga Catchment

- Water security
- Conflicting visions about the future
  - Biodiversity protection
  - Expansion of agricultural activity
- Embed key services in issues
- Show impacts of their, and others' actions
- Focus on services, not other aspects of cascade

## Water security – “simplified cascade”



## Biodiversity protection vs. agriculture - “simplified cascade”



## PBL database, initiated in 2010

- Relationships land use / biodiversity /ecosystem services
- To form basis for modelling of ecosystem services, link with (typologies of ) GLOBIO
- Pitfall: getting lost in detail
  - Not too much focus on actual output
  - Many state and “static” indicators

## A lot of data, little information

- 20 ecosystem services
- 2500 data entries
  - Mainly carbon, pest control, crop production, tourism
- Static link between land use and ES
  - State indicators: biodiversity, biophysical char., stocks
  - Missing: flow, provision of ES, other land management, such as restoration, conservation, multi-functional use

## Desired end-product

- Drop-down list of ES indicators (“menu”)
  - Related to properties, capacity and flow
- Quantified values for these indicators
- Comparison per management type
- Multiple services
  - Overlapping indicators for services
  - Bundles of ecosystem services

### What needed to be done

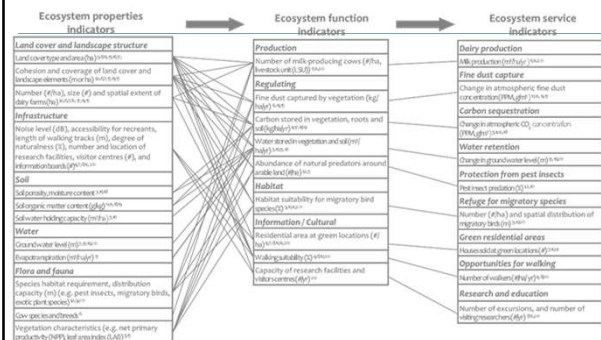
- “Re-use” and organise data
- Structure based on database (cascade)
- Additional knowledge from additional case studies and sources
- To get a general overview of the whole provision process of services (biophysical)

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### From “Spaghetti” to flowcharts – first steps



Van Oudenhoven et al. 2012, Ecol. Ind.

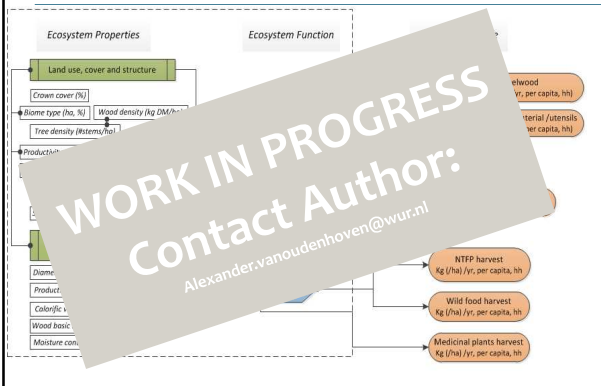
### “Drawing”, sketching ES provision

- Schematic overview of key indicators
  - Integrating (specialized) literature
- Depict the flow of ecosystem services
- Visualize (quantitative) relationships, all backed up by scientific literature
- Forming the lay-out and setup of the database
- Focus on useful information and data, not yet on comprehensive data overview



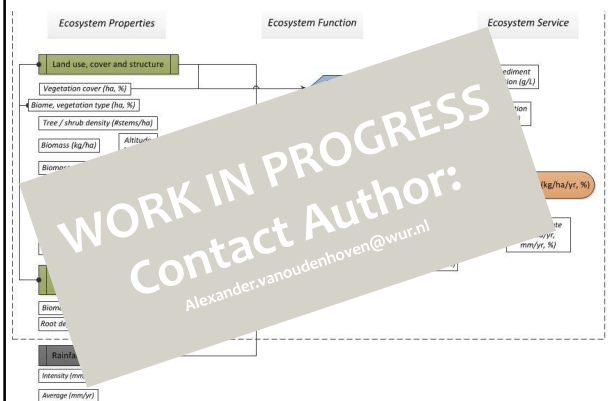
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### Flowchart raw materials, wild food



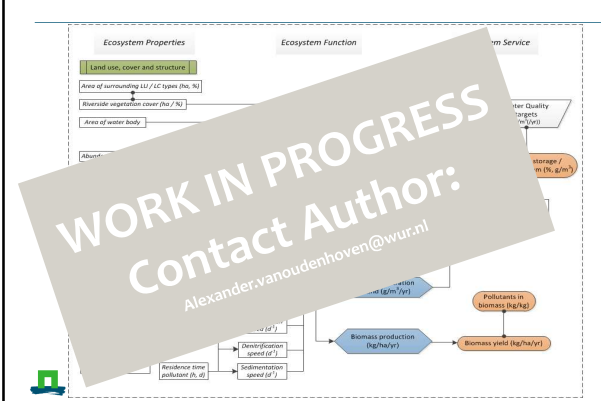
**WORK IN PROGRESS**  
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### Flowchart soil erosion prevention



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### Flow chart water purification



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## Findings of flowcharts exercise

- Alternative indicators for capacity and flow
  - Depending on required precision and spatial resolution
  - Depending on data availability, time pressure
- Services come in bundles: analyse them as such
  - Water-related services (incl. purification), erosion
  - Raw materials: NTFP, timber, medicinal plants, wild food
  - Pollination and pest control
  - Nursery, fishery (incl. aquaculture)
- Regulating & provisioning ES always linked

## In conclusion

- Start / work at different points in cascade
  - Kouga example – issues / services
  - Targets / results of visions
- Complexity, simplification depend on purpose
  - Not always all boxes needed, sometimes many more
- Although potential / capacity of ES provision is a “human”, anthropogenic concept
  - Ecological / biophysical aspects need to be understood

## In my work: Cascade important for ...

- Communication
  - Between stakeholders
  - Farmers, nature conservationists, policy-makers
  - Between scientists
- Understanding
  - What is needed now and here
- Structure work, thoughts
- Linking biophysical quantification & valuation
  - Plans to link up TEEB (ESVD) database with our database

Thank you for  
your attention!



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