

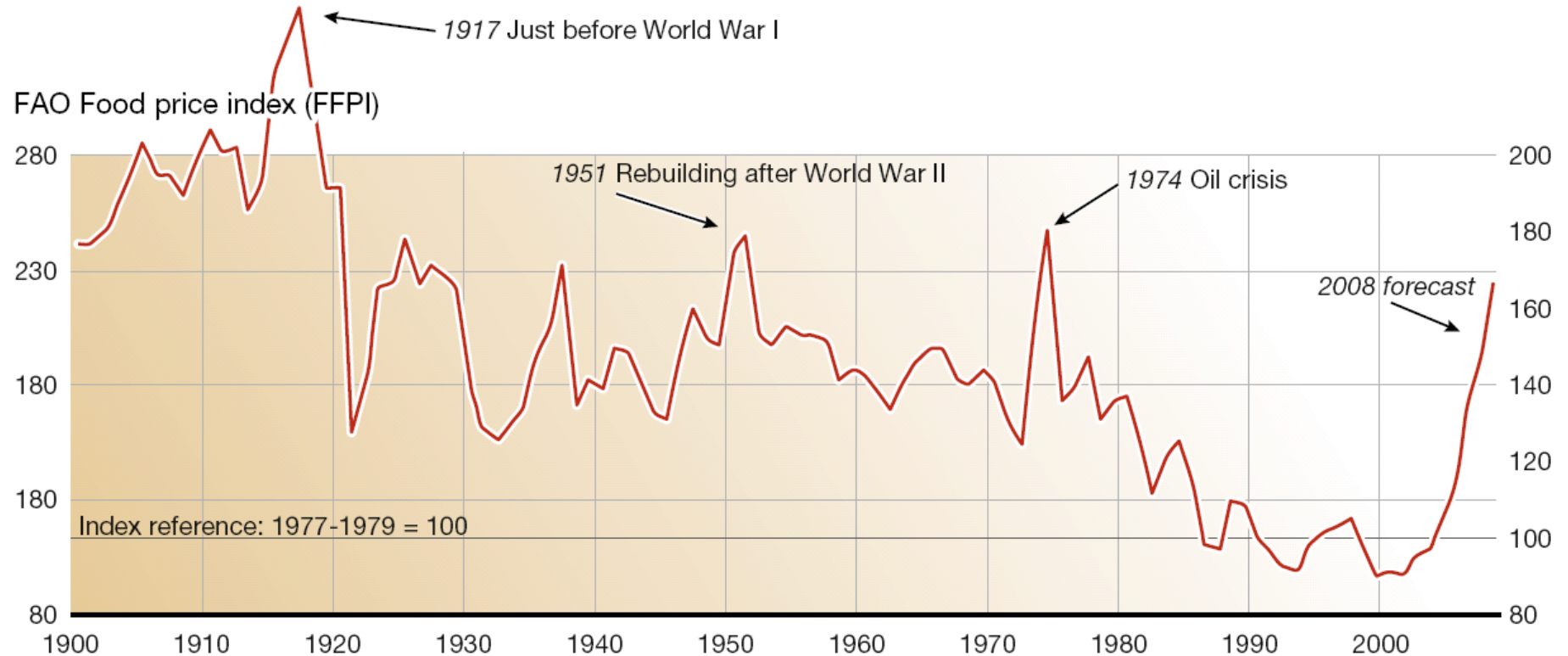
# Competing claims

25 Mei 2010 Presentatie bij Ministerie van LNV

Beleidsondersteunend onderzoek naar duurzaam landgebruik  
onder klimaatsverandering



# Recent food crisis



**Figure 1: Changes in the prices of major commodities from 1900 to 2008** reveal a general decline in food prices, but with several peaks in the past century, the last and most recent one the most extreme. (Source: World Bank, 2009).

# Primary causes of food crisis

---

1. The combination of extreme weather and subsequent decline in yields and cereal stocks;
2. A rapidly increasing share of non-food crops, primarily bio-fuels;
3. High oil prices, affecting fertilizer use, food production, distribution and transport, and subsequently food prices;
4. Speculation in the food markets.

# Global challenge for the coming decades

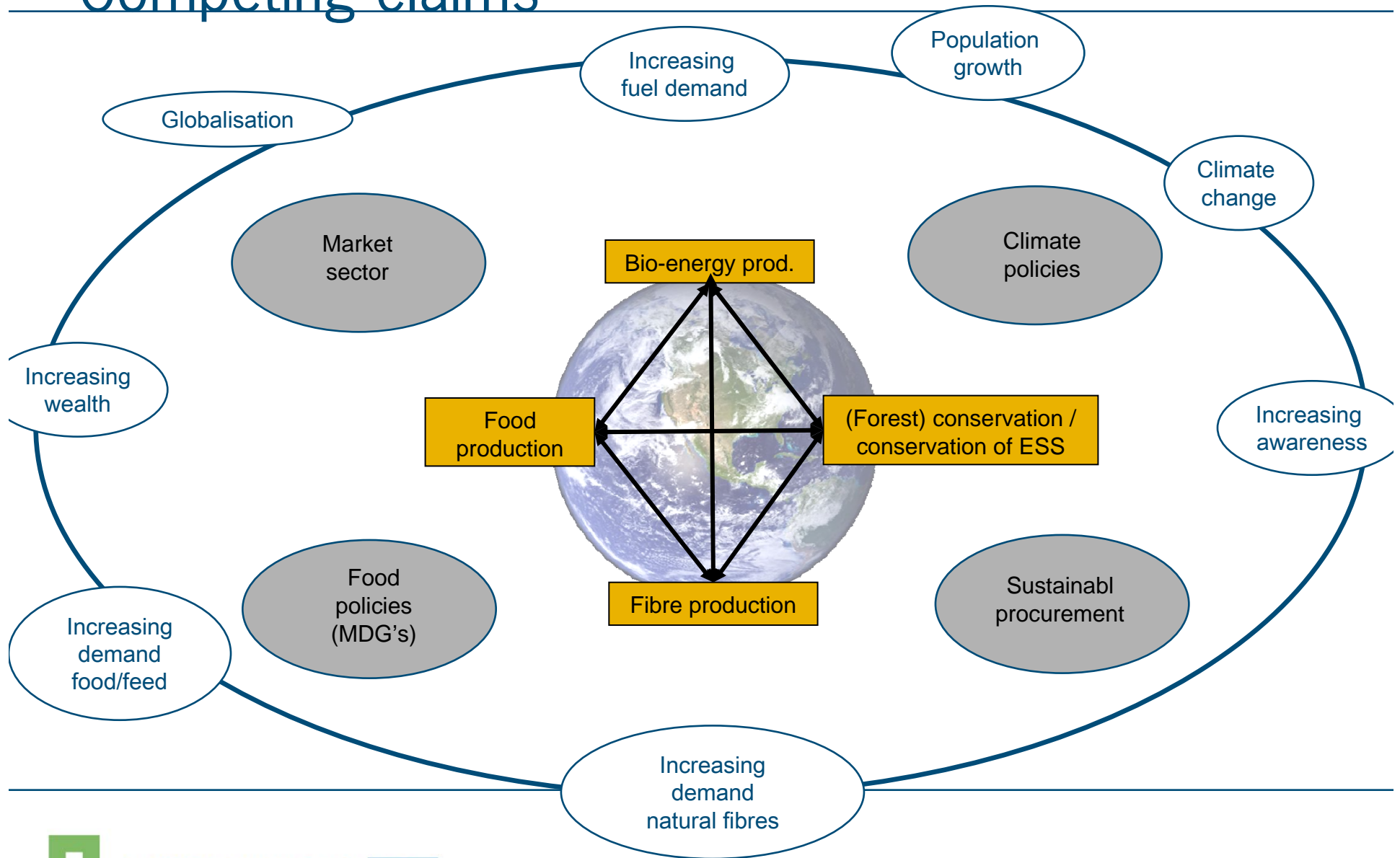
- How can current and future generations be sustainably provided with sufficient food, energy, fibres and other ecosystem services, given the limited area of available land and natural resources, and increasing world population?

# Competing claims BOCI study

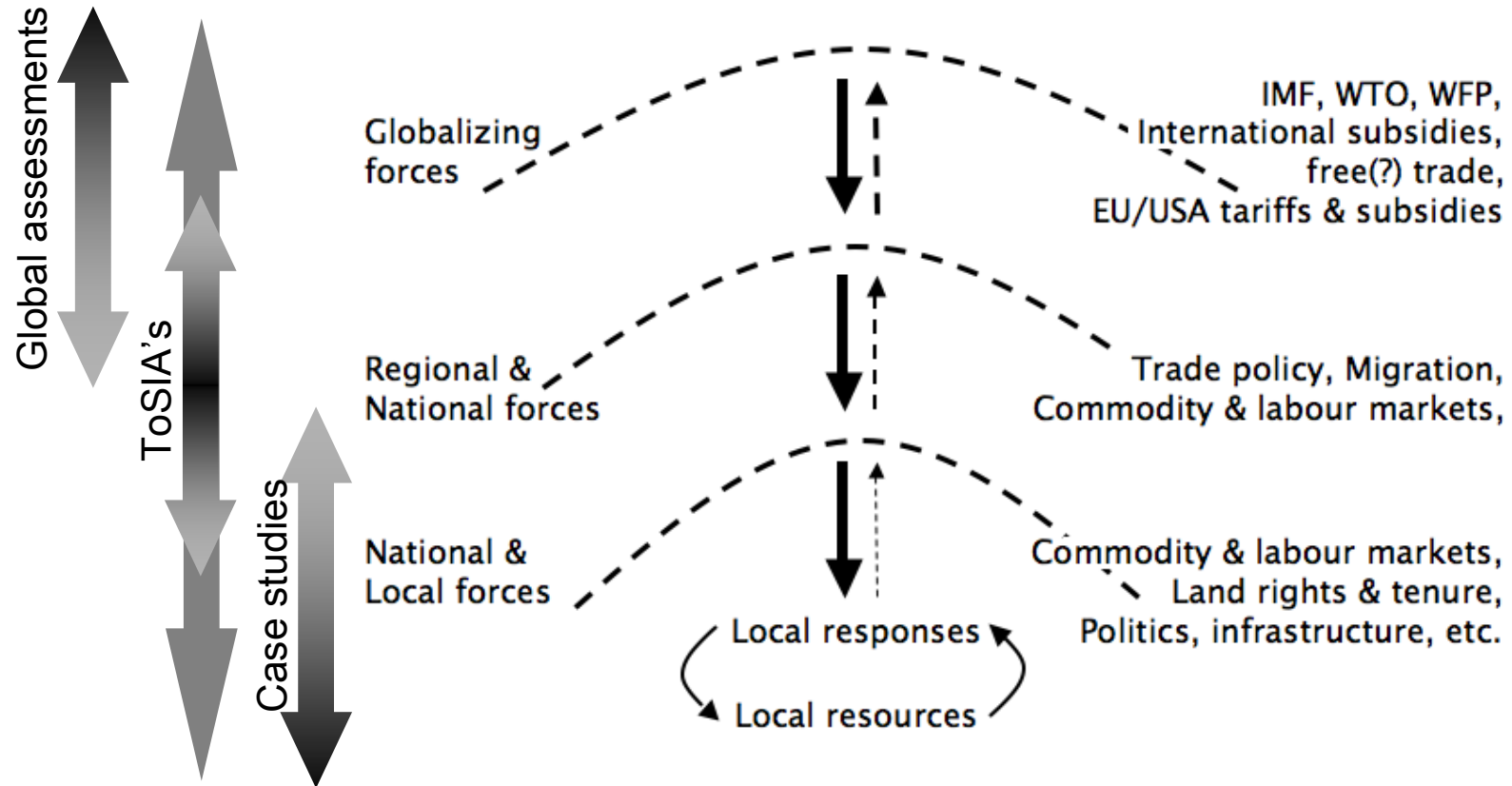
---

- Further definition and understanding of the concept competing claims
- Consequences of various policy targets for food, energy and fibre availability for land and water use, both on global and local scales
- What are the specific policy and institutional processes in developing countries that are governing land and water use, leading to, or preventing competing claims at local scales?

# Competing claims



# Integration over different scales



Giller et al, 2008



# Global context, treaties and conventions

- Globalisation: increasing economic integration and inter regional dependence.
- Millennium Development Goals: food security and sustainable environment;
- Climate policies: bio-fuels, reforestation, REDD;
- CBD, RAMSAR, CITES: halting loss of biodiversity;

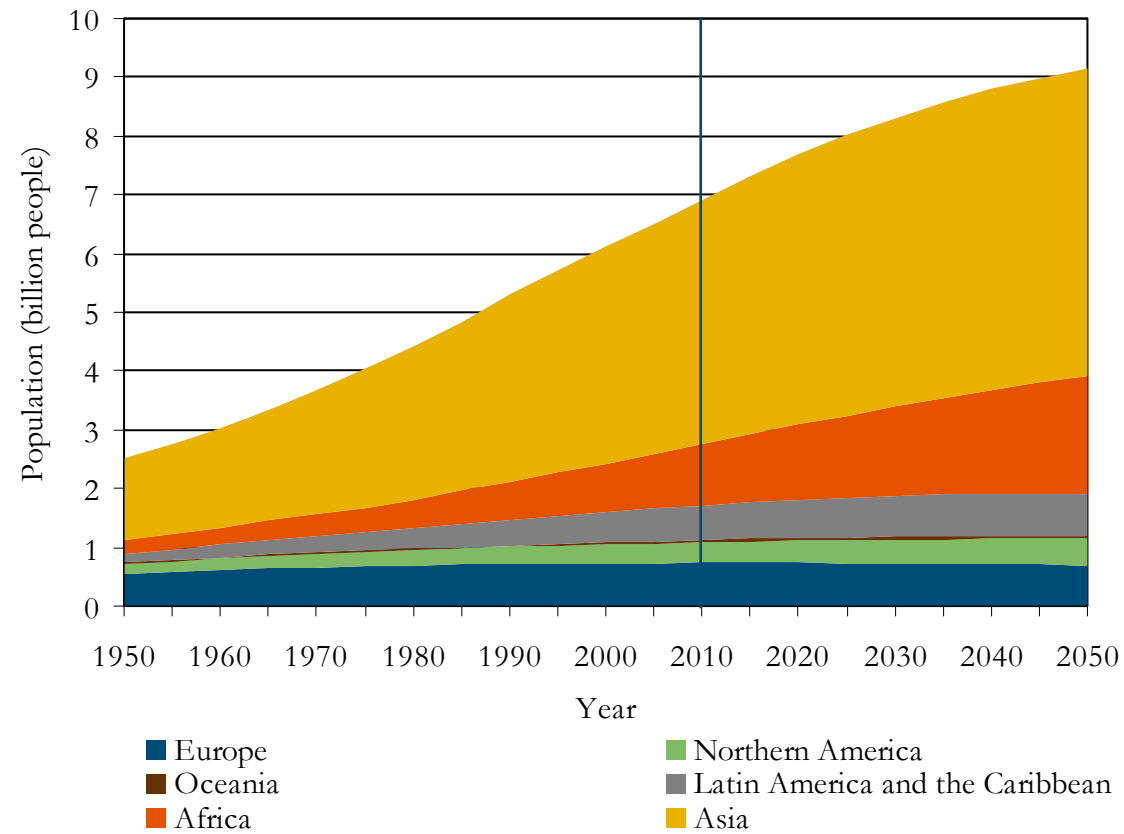




# Competing claims on natural resources

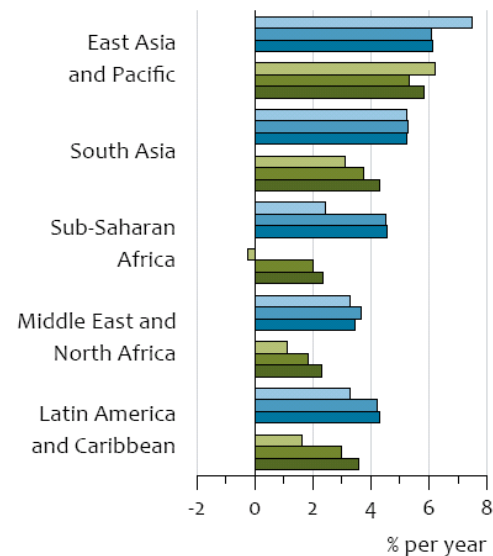
- Non-food claims on agricultural land (feed, fibre, fuel)
- Non-farm claims on land en water (urbanisation, industry, mining, ecosystem goods and services, nature conservation)
- Claims on natural ecosystems

# More people...

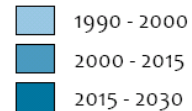


# ...getting richer...

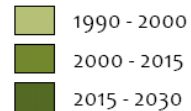
Annual economic growth



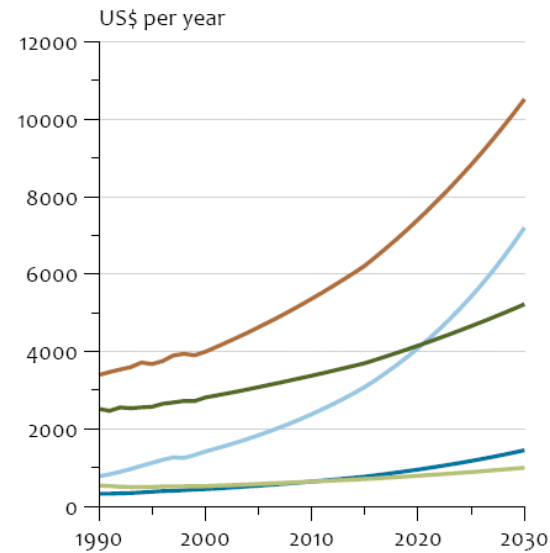
Total



Per capita



Per capita income



Projected annual total and per capita economic growth, and per capita income.

Source: World Bank, 2005



# ...changing human diet composition

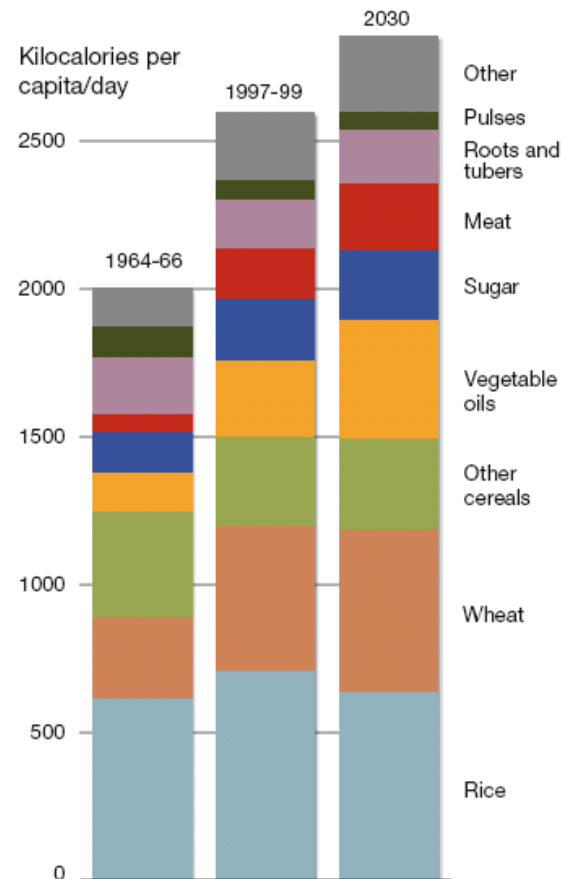
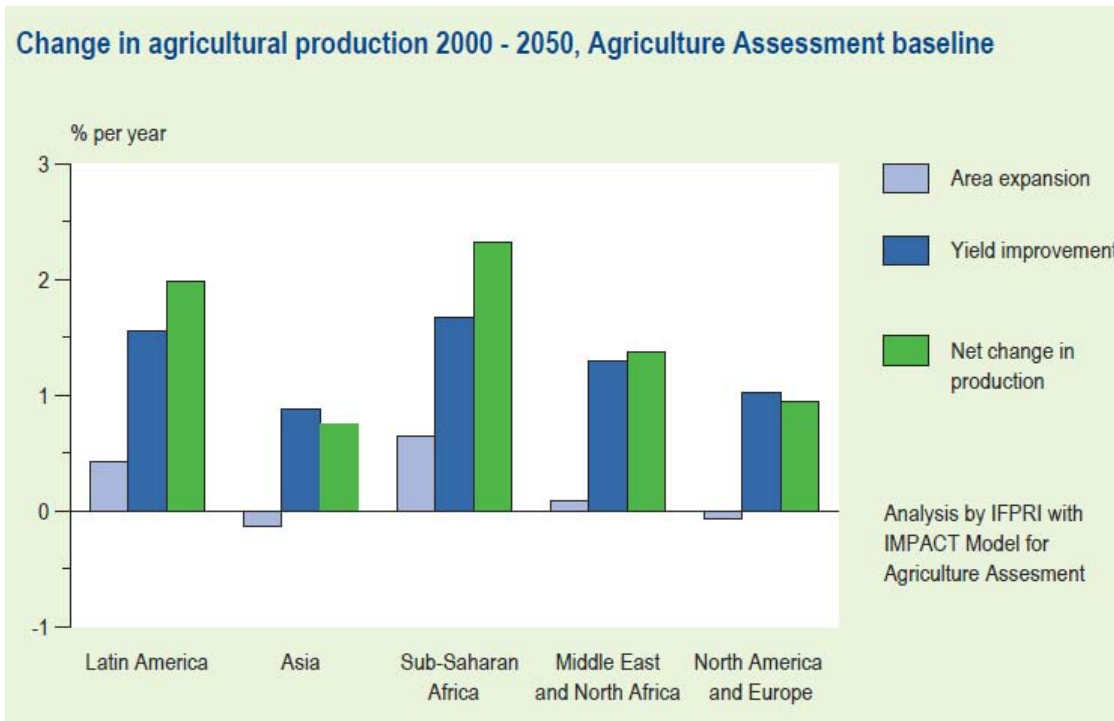


Figure 6: Changes in historic and projected composition of human diet and the nutritional value. (Source: FAO, 2008; FAOSTAT, 2009).

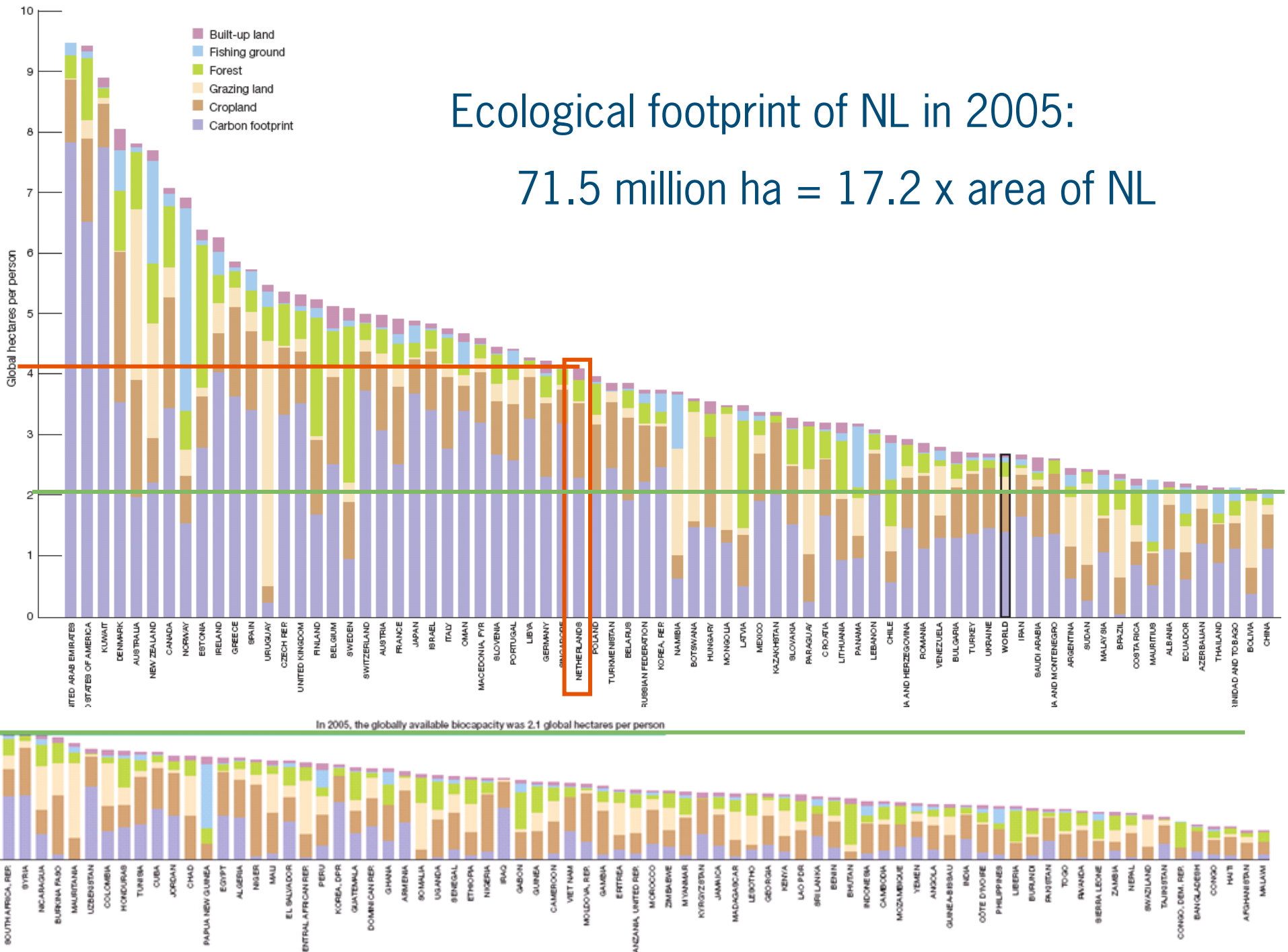


# Change in agricultural production



- According IAASTD 2008:
  - 80% of agricultural growth through intensification
  - By 2050 10% more agricultural land area

Fig. 22: **ECOLOGICAL FOOTPRINT PER PERSON, BY COUNTRY, 2005**





# Land grab or development opportunity in Africa?

Investeerders uit China, Zuid-Korea en de Golfstaten krijgen grond in ruil voor vage beloften

## Afrika geeft landbouwgrond weg

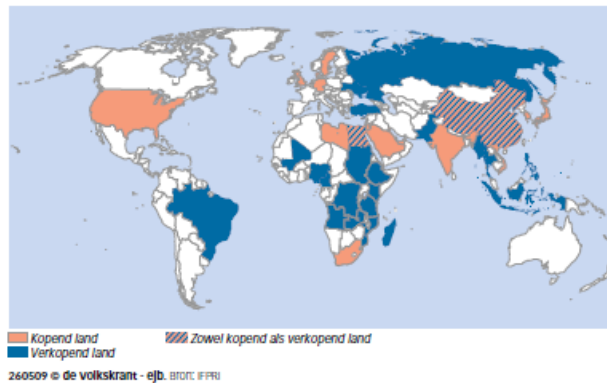
- Landbouwgrond geruild tegen 'werk' en 'infrastructuur'.
- Bevolking lijkt nauwelijks te profiteren van 'investeringen'.
- 'Het continent zou zijn huid duurder moeten verkopen.'

Van onze verslaggeefster  
Carlijne Vos

**AMSTERDAM** Afrikaanse landen geven op grote schaal landbouwgrond weg aan investeerders uit China, Zuid-Korea en de Golfstaten. In de meeste gevallen staan er slechts zwakke beloften voor de plaatselijke bevolking tegenover, zoals de aanleg van infrastructuur en het creëren van werkgelegenheid.

Dit staat in het rapport *Land Grab or Development Opportunity?* van de Voedselorganisatie FAO (Food and Agriculture Organisation) van de Verenigde Naties maandag heeft uitgebracht. Volgens de onderzoekers is in de afgelopen vijf jaar 2,5 miljoen hectare land 'aangekocht' in Ethiopië, Ghana,

GROND KOPENDE EN VERKOPENDE LANDEN



Mali, Madagaskar en Soedan. Dat is een oppervlakte ter grootte van de helft van de landbouwgronden in Groot-Brittannië.

In het VN-rapport wordt voor het eerst gekeken of bij de voedselzoektocht door rijke en overbevolkte landen sprake is van neokolonialisme waarbij de arme landen door buitenlandse investeer-

ders worden leeggehaald, of dat de investeringen een positieve stimulans hebben op de Afrikaanse economieën.

Vooralsnog lijkt de Afrikaanse bevolking niet of nauwelijks te profiteren. Afspraken over werkgelegenheid en infrastructuur zijn boterzacht. Bovendien maken de onderzoekers zich zorgen of de lo-

kale bevolking in de arme landen door de annexaties niet wordt afgesneden van landbouwgrond en water.

Hun zorgen worden door de hulporganisatie Novib. 'We vrezen dat de investeringsgolf meer kansen biedt', zegt de werker Madelon Meijer.

Een probleem is de doende inzicht is in van de investeringen zijn de gesloten condoorzicht. 'We weten niet of deze investering tot meer werkgelegenere productiviteit. Dit in Oost-Afrika leren dat Chinezen hun eigen meenemen.'

Volgens Michiel Keyraar economie en directie Stichting Onderzoekselvoorziening van de site in Amsterdam is onale 'grondstofhonger te stillen.'

'Maar', zegt hij, 'Afrihuid duurder moet met hulp van het West-

kan zijn bijdragen leveren door mee te concurreren met de Chinezen en Saoedi's, stelt Keyzer. 'Dan verdienen de landen er meer aan

goede contracten worden afgesloten.

Afrika heeft er volgens Keyzer evenmin iets aan als potentiële landen niet worden benut. 'In andere landen in het Westen laat liggen.' Het volgens Keyzer veel te op export. 'Landen in deze tijden van import moeten afvragen import van noodzakelijke stoffen veilig kunnen

Novib vindt dat de voedselreende landen hun verrijking moeten neorganisatie kijkt uit naar rt van de Wereldbank men voor de importe en zal geven. 'Hopelijk niet alleen gekeken co's voor investeerders, oor die van de lokale be e kun je beschermen sparante contracten ij mogen meebeslissen ie mogelijkheid bieden en van de voedselprojeu je de bevolking een cht garanderen.'

### Land grab or development opportunity?

Agricultural investment and international land deals in Africa



Lorenzo Cotula, Sonja Vermeulen, Rebeca Leonard and James Keeley



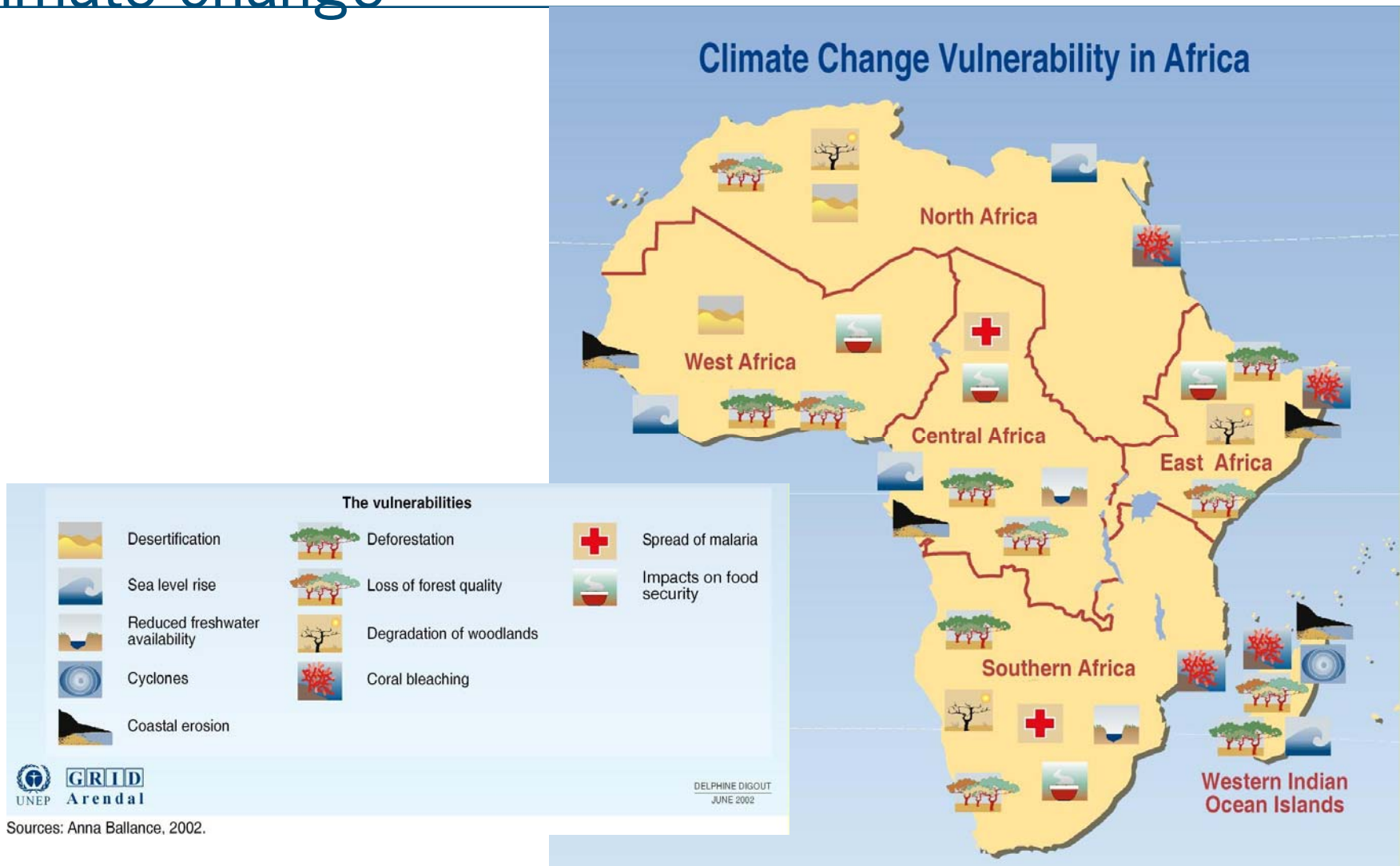
**WAGENINGENUR**  
For quality of life



# Availability of under utilised suitable land in Africa

- Total cultivable land in Africa ~ **807 million ha**
- Under cultivation ~ **227 million ha**
- Also accounting for shifting cultivation and fallow systems (5 ha to each ha under cultivation) would increase the area under cultivation to maximum **1182 million ha**.
- Marginal and abandoned land more widespread, but generally lack adequate water resources and inaccessible from market.

# Climate change



# Effects of climate change

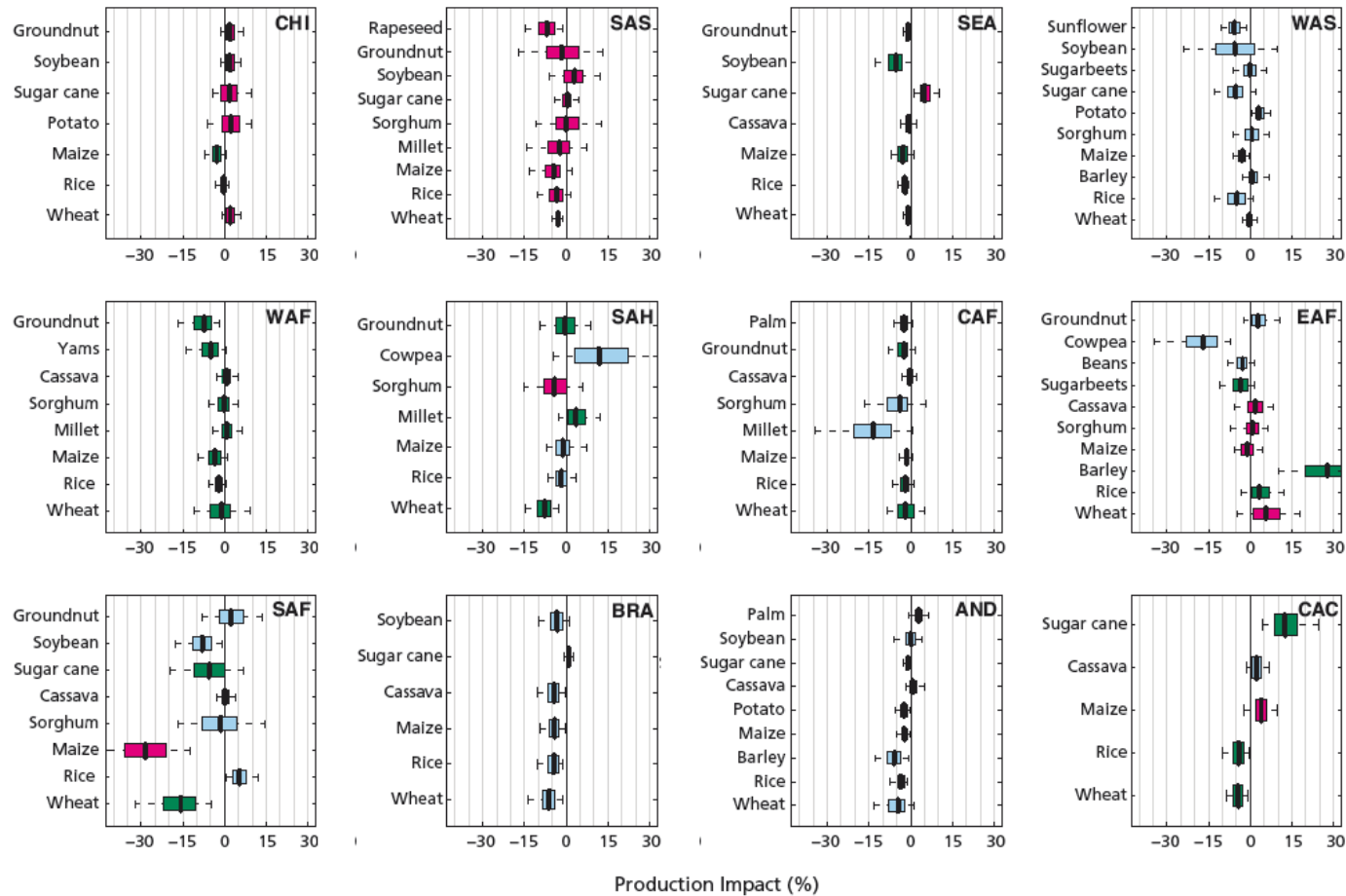


Figure 10  
Projected climate change impacts on agricultural production in 2030, expressed as a percentage change relative to 1998-2002 average yields. Pink, green and blue indicate a "hunger importance ranking" of 1 to 30 (more important), 31 to 60, and 61-94 (less important), respectively. Dashed lines extend from 5th to 95th percentile of projections, boxes extend from 25th to 75th percentile, and the middle vertical line

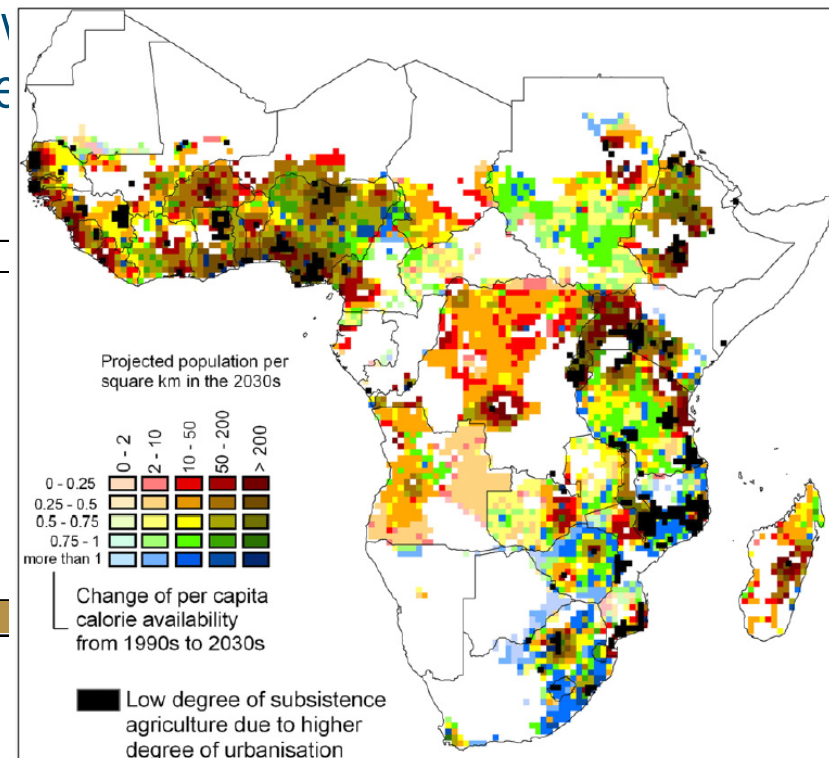
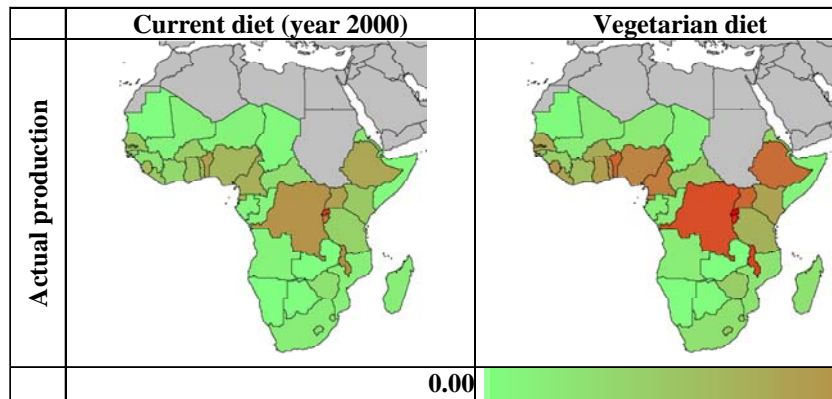
within each box indicates the median projection. Region codes are: CHI – China; SAS – South Asia; SEA – Southeast Asia; WAS – West Asia; WAF – West Africa; SAH – Sahel; CAF – Central Africa; EAF – East Africa; SAF – Southern Africa; BRA – Brazil; AND – Andean Region; CAC – Central America and Caribbean<sup>64</sup>.



# Requirement/availability of agricultural land

The ratio land requirements/availability for agricultural land per country in SSA for different production scenarios (actual, reined, and potential) and different diet compositions (current, vegetarian, and potential) (Jongschaap & Bindraban, unpublished)

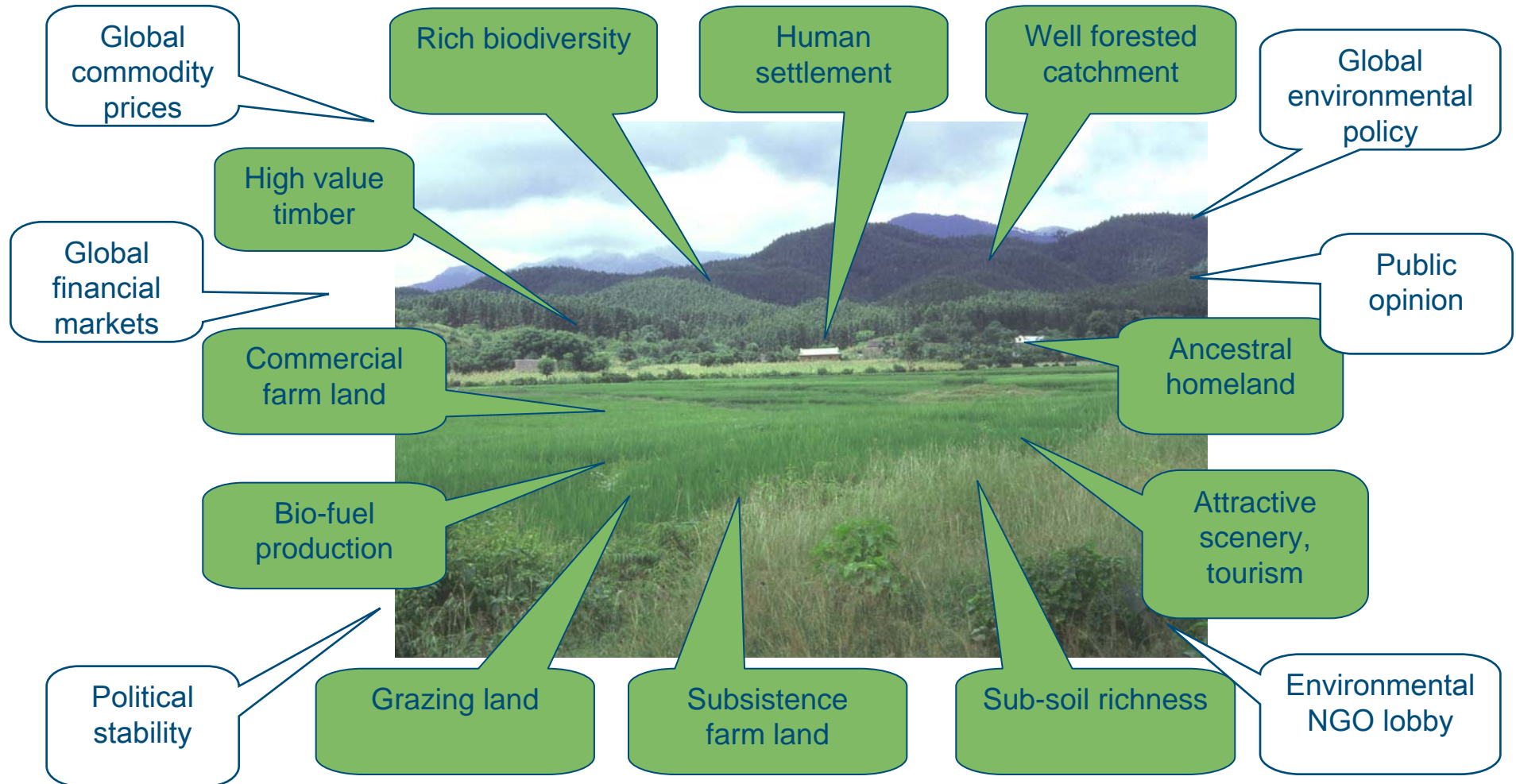
*J. Liu et al. / Global and Planetary Change 64 (2008) 222–235*



- 
- Effects of global trends on land-use and land-use change strongly differ per socio-economic and/or ecological region
  - Also consequences on level of competition between different claims on natural resources differs



# What determines local land use decisions?



# Case studies

---

- Global trends show the demands and production potentials for different regions
- Zooming in to the local level, local landscape dynamics, stakeholder interests, power relations and (political) decision making processes become more important
- More fuzzy factors play an important role in decisions on land-use

# Case studies

---

- Drivers – pressures – state – impact – responses (DPSIR)
- Stakeholder analysis
- Analysis of power relations

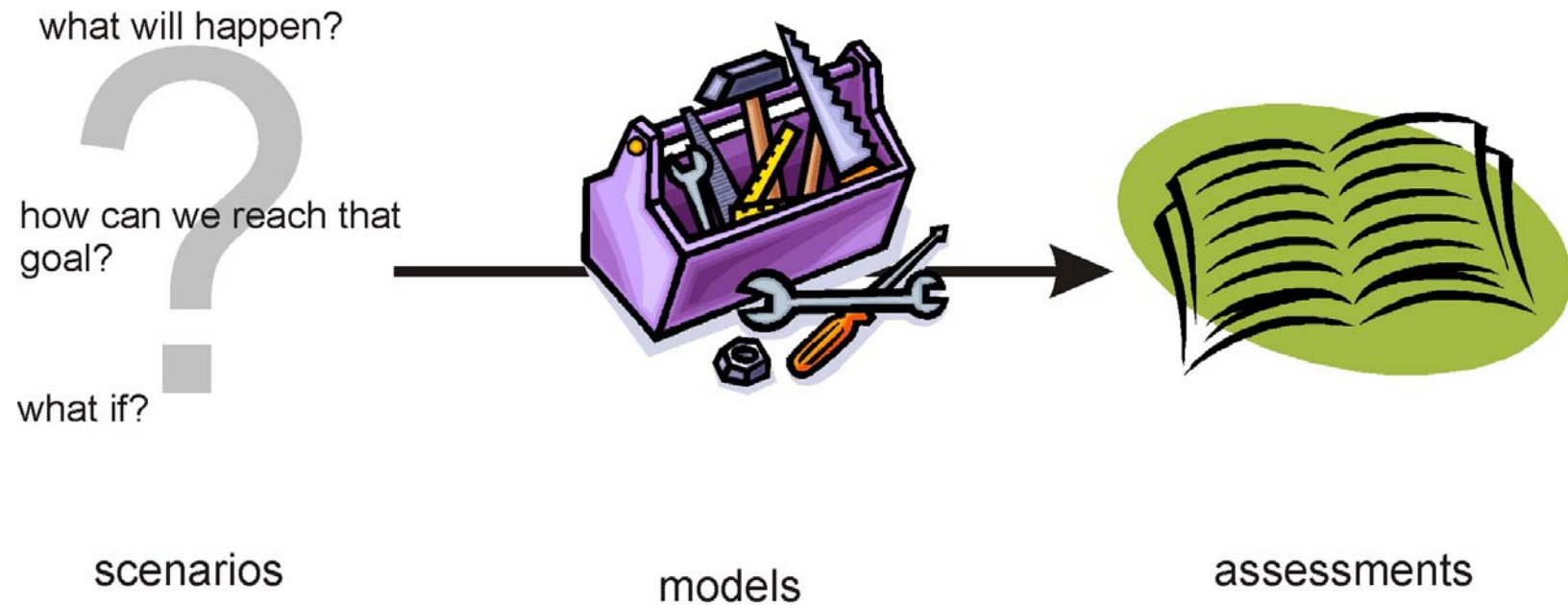
# Case studies

---

Table 3.1: Case studies, themes and contact persons

No	Case study	Themes	Contact person
1	Competing claims on land in the Loess plateau, China	The impact of urbanization, industrialization and modernization on land use in China's Loess Plateau	Alterra: Rudi Hessel
2	Trans-boundary nature conservation: the case of the Limpopo trans-boundary park, Mozambique	Controversy between tourism development, nature conservation and local peoples' livelihoods	Alterra: Violette Geissen
3	Illegal or incompatible: Managing the consequences of international trade agreements on local livelihoods in Ghana	International timber trade agreements and local livelihoods (WUR-DGIS partnership)	WI: Nico Rozemeijer
4	WSSD partnership in Ethiopia (BO 10 006 023 02 Ethiopia)	Horticulture production versus local food production	LEI: André de Jager Olga vd Valk

# Tools to evaluate policies determining land-use



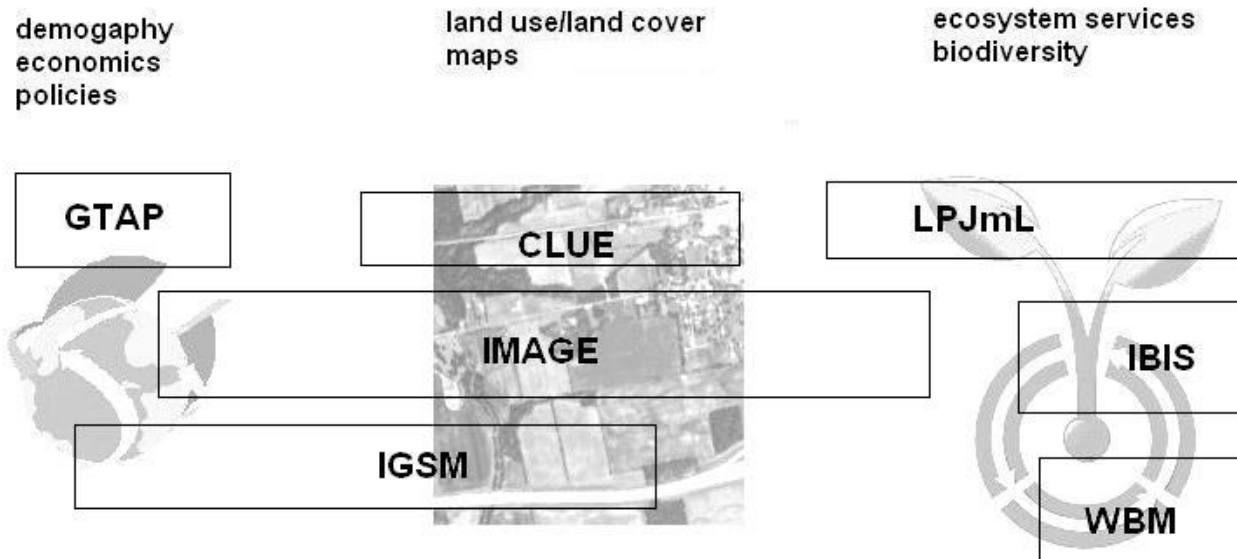
# Models

---

- Different type of models available for different themes and scales:
  - Socio-economic models determining demand for commodities and land-uses (e.g. GTAP)
  - Biophysical models projecting changes in climate conditions, vegetation growth and agricultural production (e.g. LPJ, IBIS)
  - Models projecting changes in delivery of other ESS and biodiversity
  - Land use models spatially allocating demand for land-use (e.g. CLUE)
  - Integrated assessment models (e.g. IMAGE, AIM)
- How to include results from stakeholder and power analysis as additional boundary factors?



# Assessments and decision support – linking models



# Example: Eururalis – discussion support

---

- Investigate possible developments of European rural areas to explore effects on ecology, economy and socio-cultural aspects.
- Four narratives: world views play out differently
- Policy options lead to scenario-dependent consequences (CAP, biofuels, LFA)
- Link agro-economy & other sectors (nature, peri-urban)
- Wide range of indicators (people-planet-profit)
- Bio-energy: linking food – feed – fuel
- Multi-scale approach: global context via countries & regions (including developing countries)
- Causal-tracing: What is the contribution of policy

# EURURALIS

Eururalis results & conclusions

Explore your future

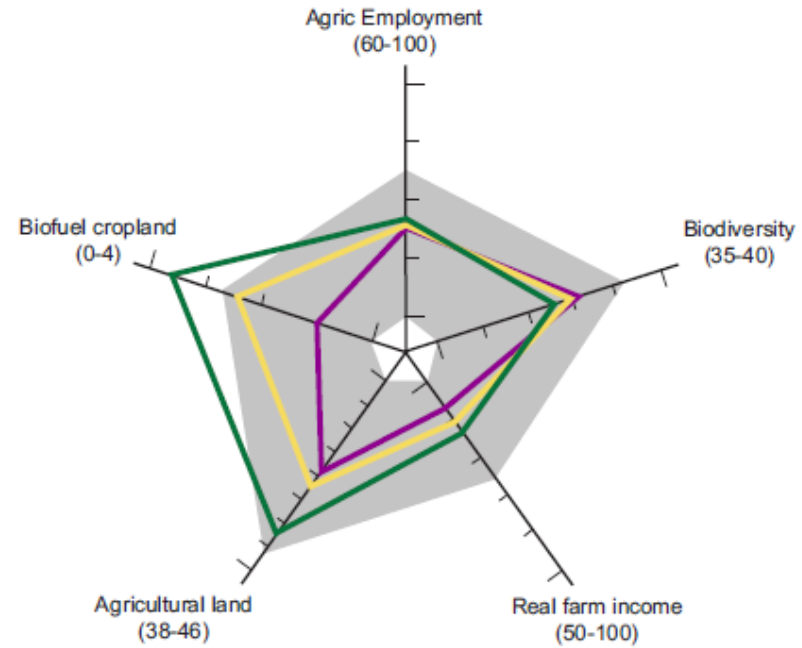
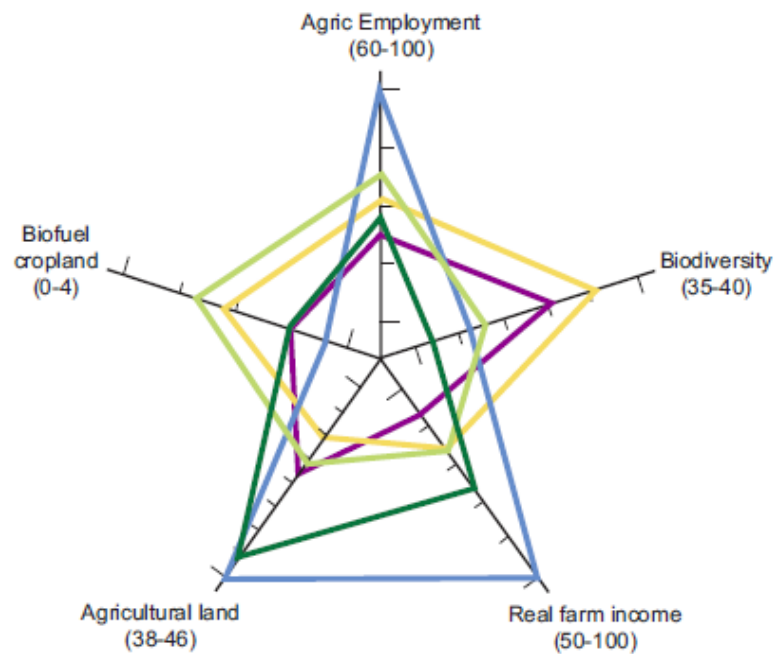
Eururalis background

The Tool

About the Tool

About scenario's drivers and policy

About indicators



2000  
Global Economy  
Continental Markets  
Global Co-operation  
Regional Communities

Global Economy Global Economy Medium Global Economy High

[View full screen](#)

orbe verum terrarum saepe gessi victorque omnibus veniam petent civibus peperci. Externas bonifi-  
gentes, quibus tuto ignosci potuit, conservare quam excidere malui. Millia civium Romanorum. Exter-  
externas gentes, quibus tuto. [Read more >>](#)

Save policy scenario

Map: ☒ Single map ☐ Comparison

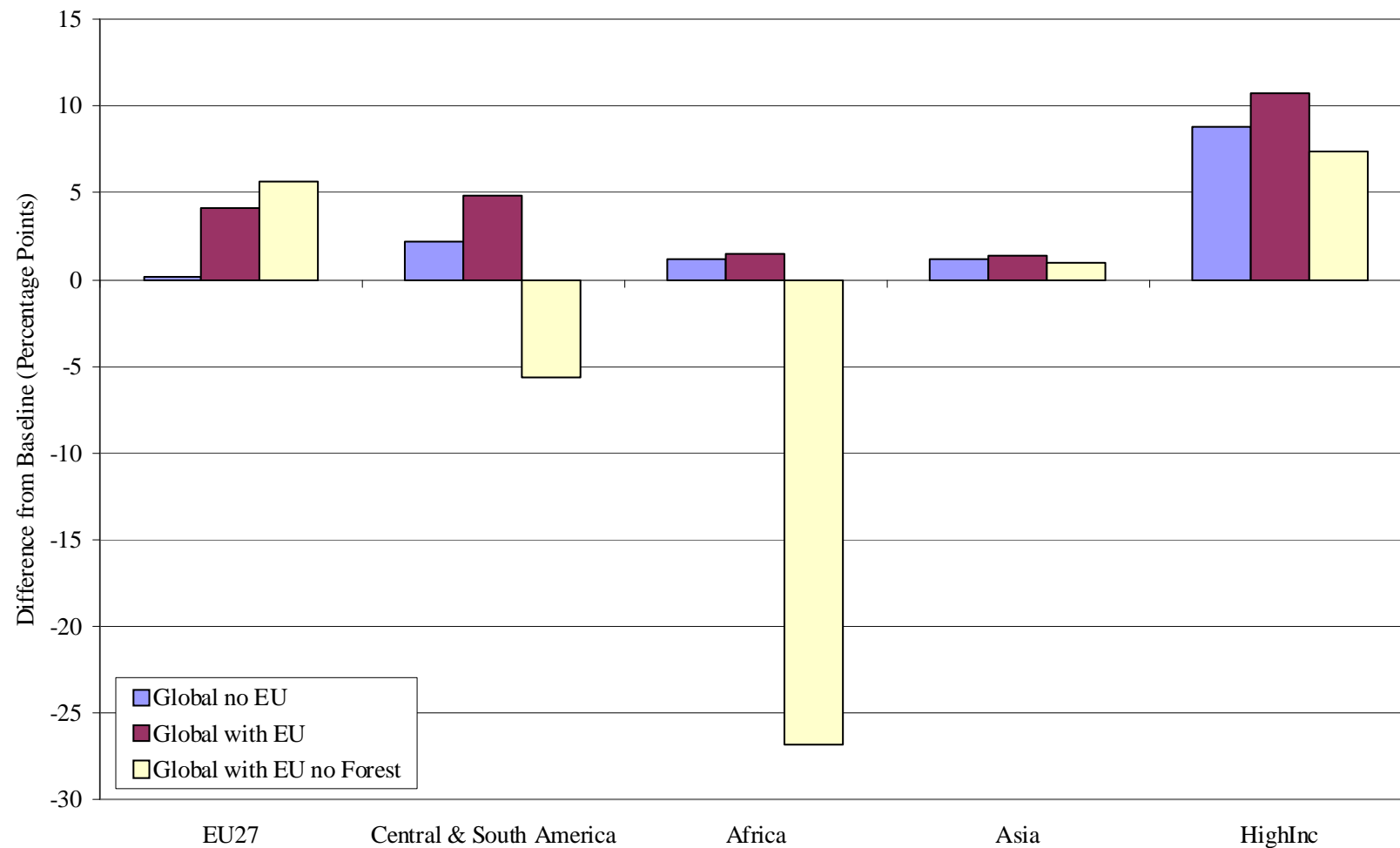


WAGENINGEN UR  
For quality of life

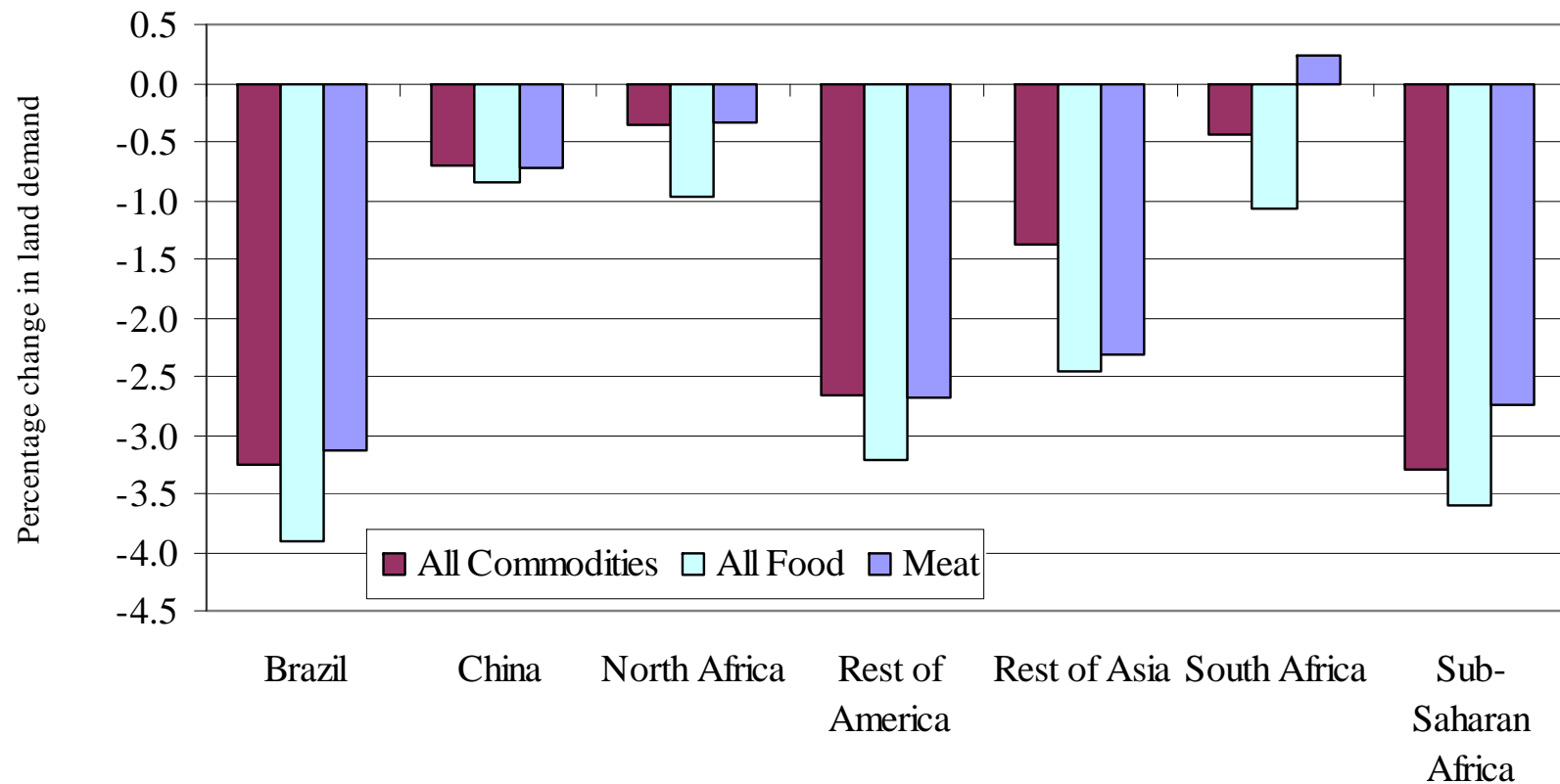
# Climate mitigation: Biofuel and REDD scenarios

- Biofuel policies introduced:
  - growth of food, feed and fuel production
  - Mainly (80%) through agricultural area expansion
  - a slightly (net) increase of CO<sub>2</sub> emission
- Protecting forests:
  - less land available in Brazil, Africa
  - ag. commodity prices go up in these regions;
  - food security is threatened;
  - CO<sub>2</sub> emission halved compared to first scenario.

# Changes in land use per region



# Effect of reducing meat consumption





# Thank you!

Alterra: Eric Arets, Rudi Hessel, Violette Geissen

LEI: Siemen van Berkum, Jolanda vd Berg, André de Jager & Olga vd Valk, Hans van Meijl

WI: Cora van Oosten, Nico Rozemeijer & Ingrid Gevers

PRI: Raymond Jongschaap & Prem Bindraban

PBL: Elke Stehfest

© Wageningen UR



# Climate change adaptation and mitigation in East Africa/Ethiopia

Catharien Terwisscha van Scheltinga, Eric Arets, Bette Harms,  
Fulco Ludwig, Jouwert van Geene, René Verburg and Jan Verhagen  
Wageningen University and Research Centre

Presentation of projects 'Climate and adaptation' (BO-10-009-003) and 'Development of  
feasible sustainable agriculture strategies in a climate change context in Ethiopia'  
(BO-10-009-107) at the Ministry of Agriculture, Nature and Food Quality  
The Hague, 25 May 2010

# Overview

---

1. Main message
2. Adaptation to climate change in developing countries
3. Approach for Capacity Development

Projects: 'Climate and adaptation' (BO-10-009-003) and 'Development of feasible sustainable agriculture strategies in a climate change context in Ethiopia' (BO-10-009-107)

- Course: Climate change adaptation in agriculture and natural resources management
- Framework for knowledge component
- Support to policy development

4. Discussion and conclusion

# 1. Main message

---

- Climate change is to be seen in the context of sustainable development, and as a change process
- We therefore follow an approach of capacity development in which we interlink
  - Training
  - Knowledge
  - Policy support
- In this way addressing a changing science policy interface, and the issue of uncertainty

## 2. Adaptation to climate change & developing countries

- No 'one size fits all' story possible!! Connecting scales, complex issues
  - High climate variability
  - Limited adaptive capacity
  - Vulnerability (groups, environment, living) to climate change
  - Dependency on agriculture and natural resources
- Link between sustainable development and climate change adaptation?
  - Chapter 17 AR4, 2007
  - Advice to EU Parliament, Ludwig et al, 2007
  - Link to Millennium Development Goals (MDGs)
  - The link is shown in the subject of land use change



### 3. Capacity development

---

LNV support program started in 2008

Timeline on next slide. The approach follows 3 main lines:

- Course Climate change adaptation in agriculture and natural resources management
- Research collaboration on knowledge questions
- Support to LNV for international policy development at a higher level

Information at:

- <http://portals.wi.wur.nl/climatechange>

# Observations

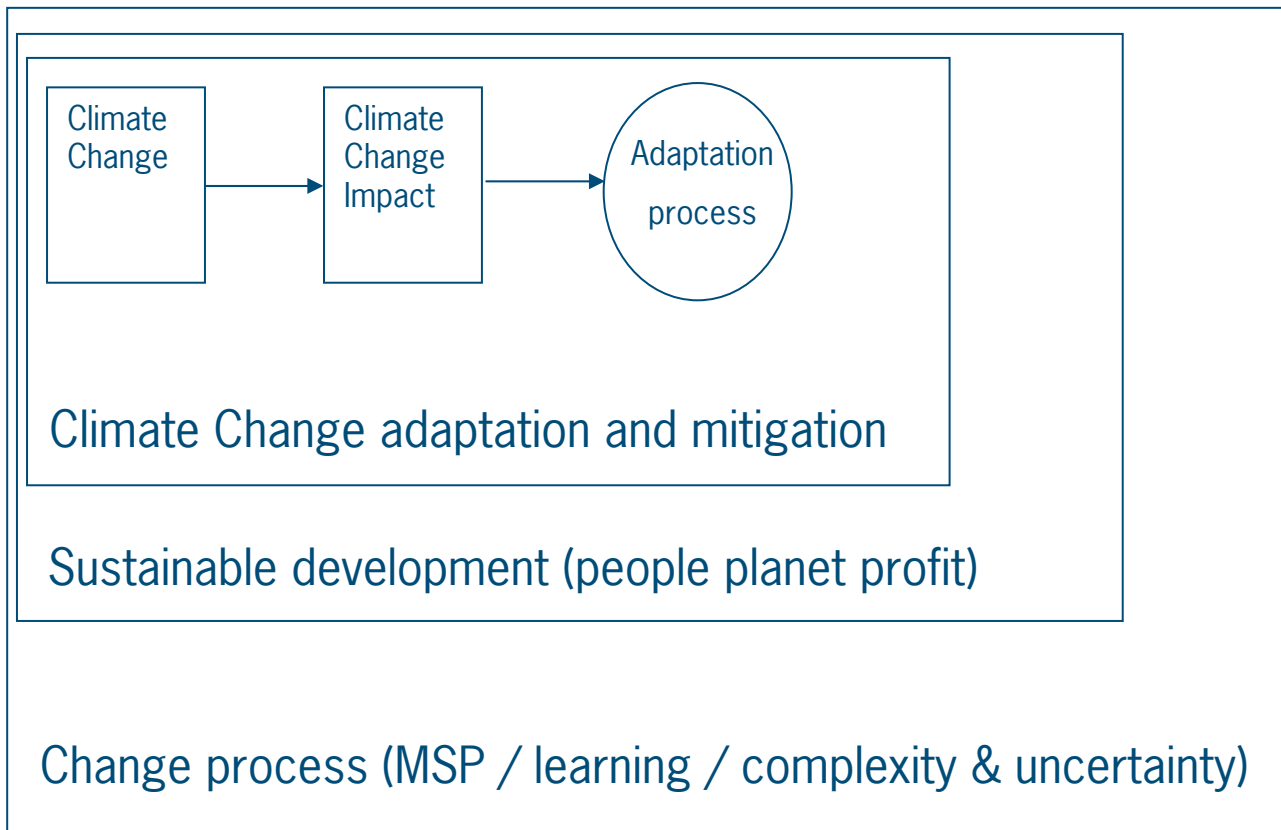
---



1. Link between climate change adaptation and sustainable development;
  - Example: in the course a hotspot assignment where vulnerability is not only seen from the point of view of climate, but also people/planet/profit
  - Example: in the knowledge group: a lot of time required to 'talk the same language'
2. Link CCA/SD to change process
  - Multi stakeholder approach Making tacit knowledge explicit (course; knowledge exchange)
  - Learning elements in the process – knowledge, skills and attitude change
  - Dealing with uncertainty (science policy interface – day to day work)
  - Emergent approach; Steps cannot be planned beforehand. E.g. development in Copenhagen influenced interest of policymakers for seminar during the course



# Adaptation to climate change as a change process



# Time line of the support programme

Activity	Course	Knowl.	Policy
June 2008: Scoping workshop 1			
November 2008: Scoping workshop 2			
February 2009: Meeting with HoA-REC	x		
June 2009: Course	x		
August 2009: With MinLNV at FAO			x
November 2009: Framework & Indicator set		x	
November 2009: Reflection meeting	x		
<i>December 2009: COP15, Copenhagen</i>			x
January 2010: Follow up framework		x	
March 2010: Manual of the course	x	x	
March 2010: Course	x	x	
May 2010: Document		x	
(planned) May/Sep 2010: Case study research		x	
<i>(planned) September 2010: pre-conf Africa</i>			x
<i>(planned) November 2010: Agriculture and Climate conference, The Hague</i>			x
The x indicates the emphasis of the activity			

# Course: Climate change adaptation in agriculture and natural resources management

## ■ Capacity development

- Working together with UAA – HoAReC
- Joint process with partners (selection of candidates, planning of course etc)
- Link to research work in course
- Course first organized in 2009, 2<sup>nd</sup> time 1-12 March 2010
- Course planned for 2011, possibility for HoA-REC/WUR course, with HoA-REC lead
- NFP funding available for candidates
- Training manual prepared and available



# Course: Climate change adaptation in agriculture and natural resources management

---

## ■ Content

- Understanding climate change, implications for food security and agriculture, vulnerability assessment, integrating climate change into policy processes
- Link to NAPA's, land use change, stakeholders

## ■ Skills and attitude change

- Uncertainty, continuous learning

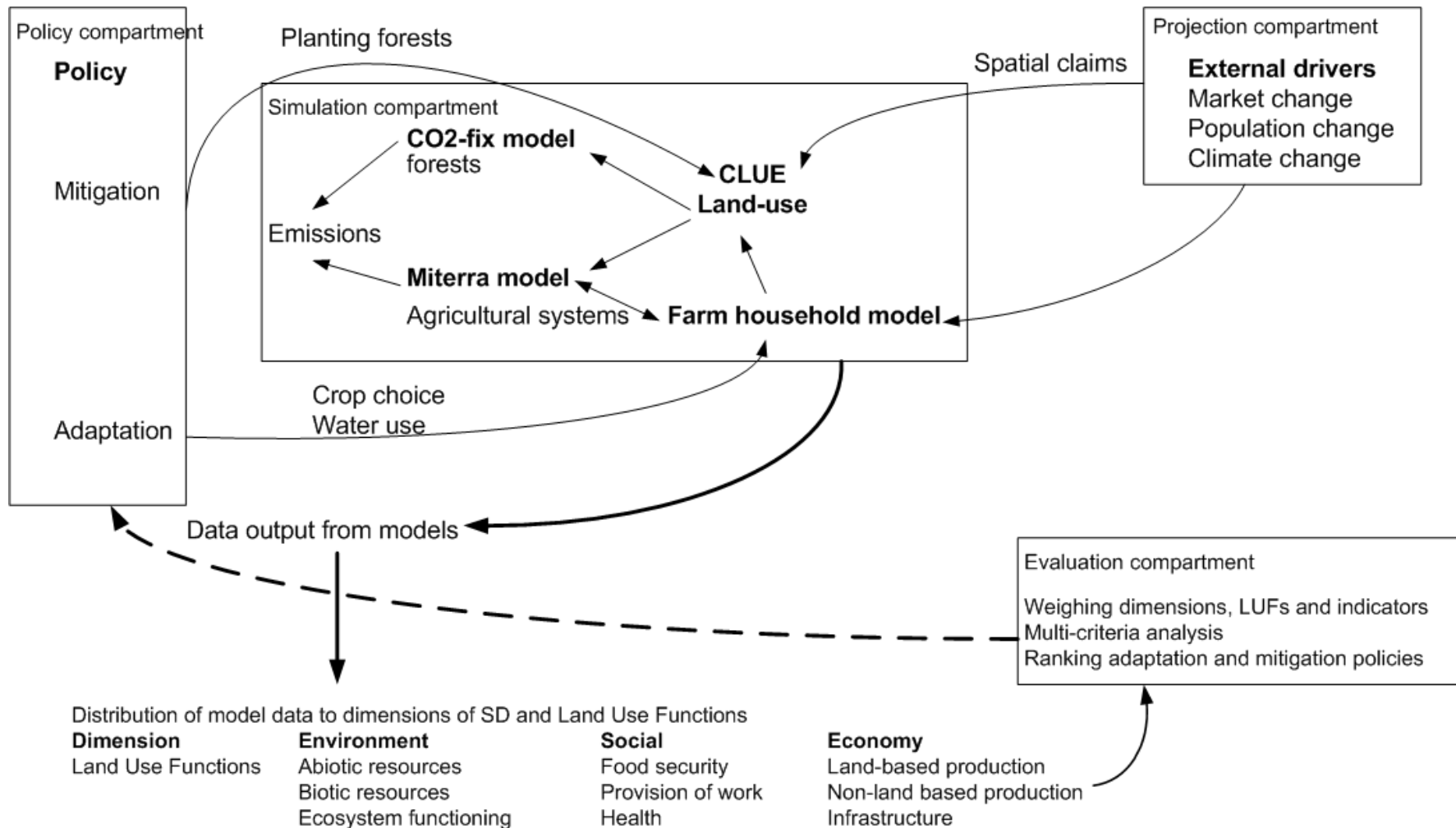
# Knowledge exchange

---

- Shared knowledge with vulnerability as the entry point
- Joint understanding: report
- Identified with policy makers relevant issues (Forest coffee, Central Rift Valley)
- Develop proposal and linkage with partners
- Analyse case, using land use to link climate change adaptation, mitigation and development issues (use e.g. LUPIS)



# Modelling and assessment framework





# Case study Central Rift Valley

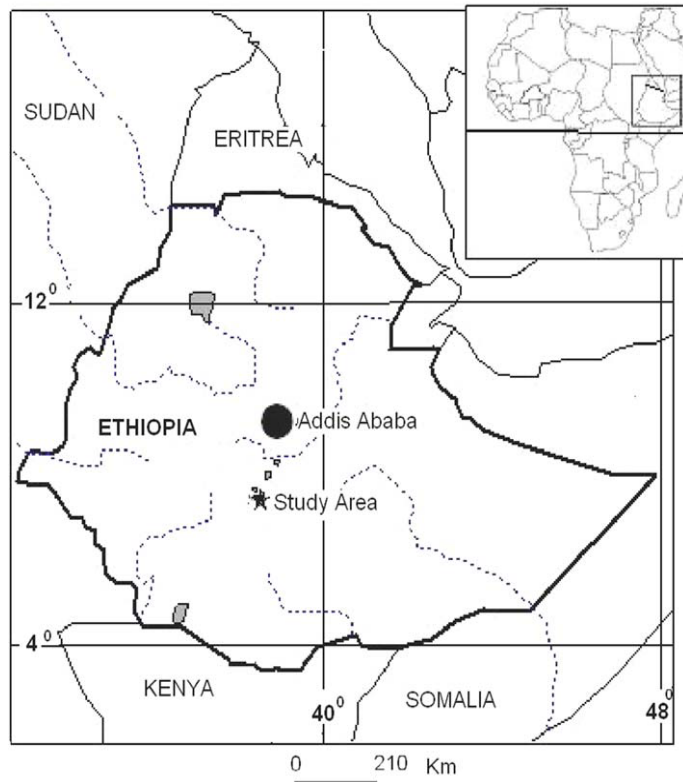


Figure A1.4.1: Study area in Ethiopia

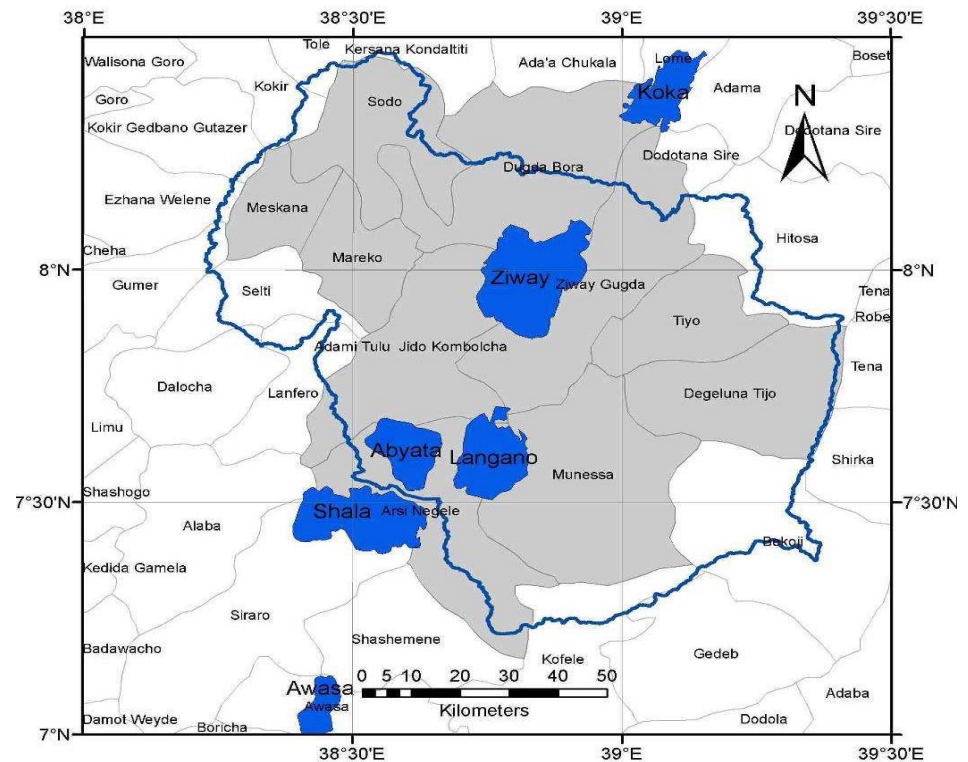


Figure A1.4.2: Central Rift Valley Water basin

# Case study Central Rift Valley

---



## High level policy support

---

- *'Adaptation to climate change only happens if our Minister of Finance is convinced...'* This shows the importance of a sense of urgency – which cannot be solved with training or knowledge exchange – and high level support of LNV is required
- Example: LNV/FAO visit (2009)
- Policy support works at different levels: Role Ethiopia on behalf of Africa in Copenhagen also was followed with activities in Ethiopia and resulted e.g. in more interest in the policy seminar during the training course

# Discussion and conclusions

---

- Evolving process: Time consuming, depending on partners, communication with all parties important
- Learning important
- Uncertainty as part of the work: business as usual is not an option (doing nothing is not good – is a useful lesson)
- Science policy interface changes need not only time, but also commitment from all parties involved

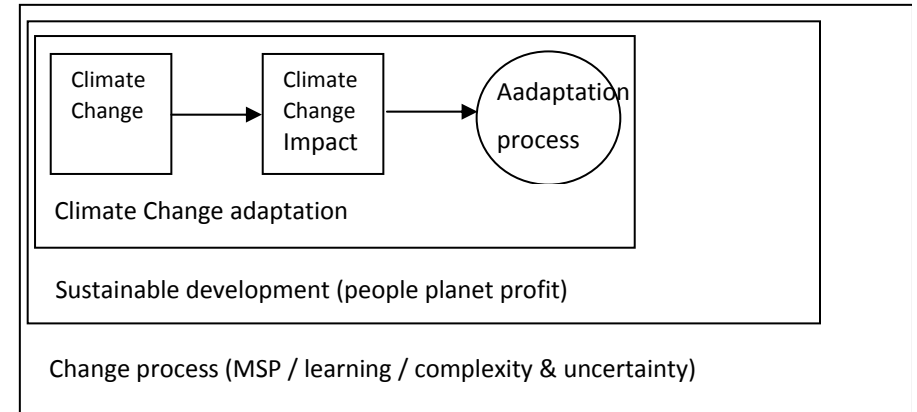
## 5. Discussion and conclusion (continued)

### ■ Conclusion:

Framework useful for action research on and capacity development for climate change adaptation

### ■ Important elements are the links to

- Sustainable development
  - E.g. in hotspots define vulnerability for people-planet-profit
  - Land use change (adaptation and mitigation)
- Change process
  - a multi-stakeholder perspective
  - learning perspective
    - Knowledge, skills, attitude
    - Making tacit knowledge explicit
    - Step by step approach



## 5. Discussion and conclusion

---

### ■ Discussion

- Organising stakeholder involvement and engagement
  - Scientists and policy makers involved in the process
  - Joint fact finding, sharing results, developing a training course together
- Design and implementation of research methods and tools
  - Training as boundary method
  - Observation and reflection throughout the process
  - Learning together, formulating next step (uncertainty!)
- Engagement and collaboration of social and biophysical scientists
  - Scientists involved in the analysis, making tacit knowledge explicit



Thank you

<http://portals.wi.wur.nl/climatechange>

[Catharien.Terwisscha@wur.nl](mailto:Catharien.Terwisscha@wur.nl)

