Session 30: Convergence of scientific disciplines

Necessity for system based research and development

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Content

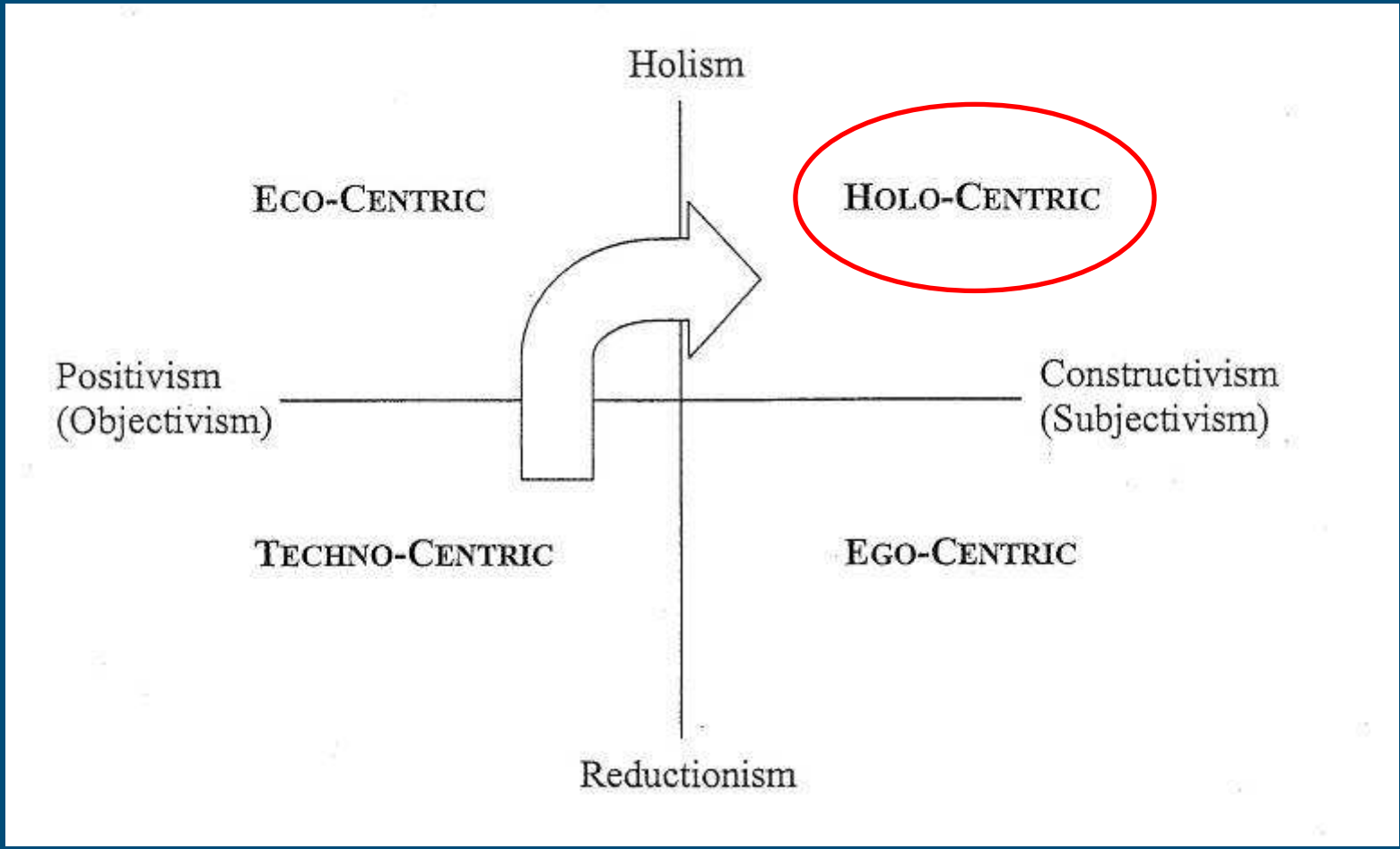
- Background
- INREF evolution
- INREF POND and Competing Claims
- Relevance for Animal Production Systems
- Continuity

Background 2000-2003

- WUR Working Group Sustainable Development and System Innovation: beta-gamma collaboration for integrated development. Focus on content/methodology and process
- H-R-H approach: from holism via reductionism and back to holism
- Chaired by the dean Prof. Rabbinge, 9 diverse discipline members

Background 2000-2003

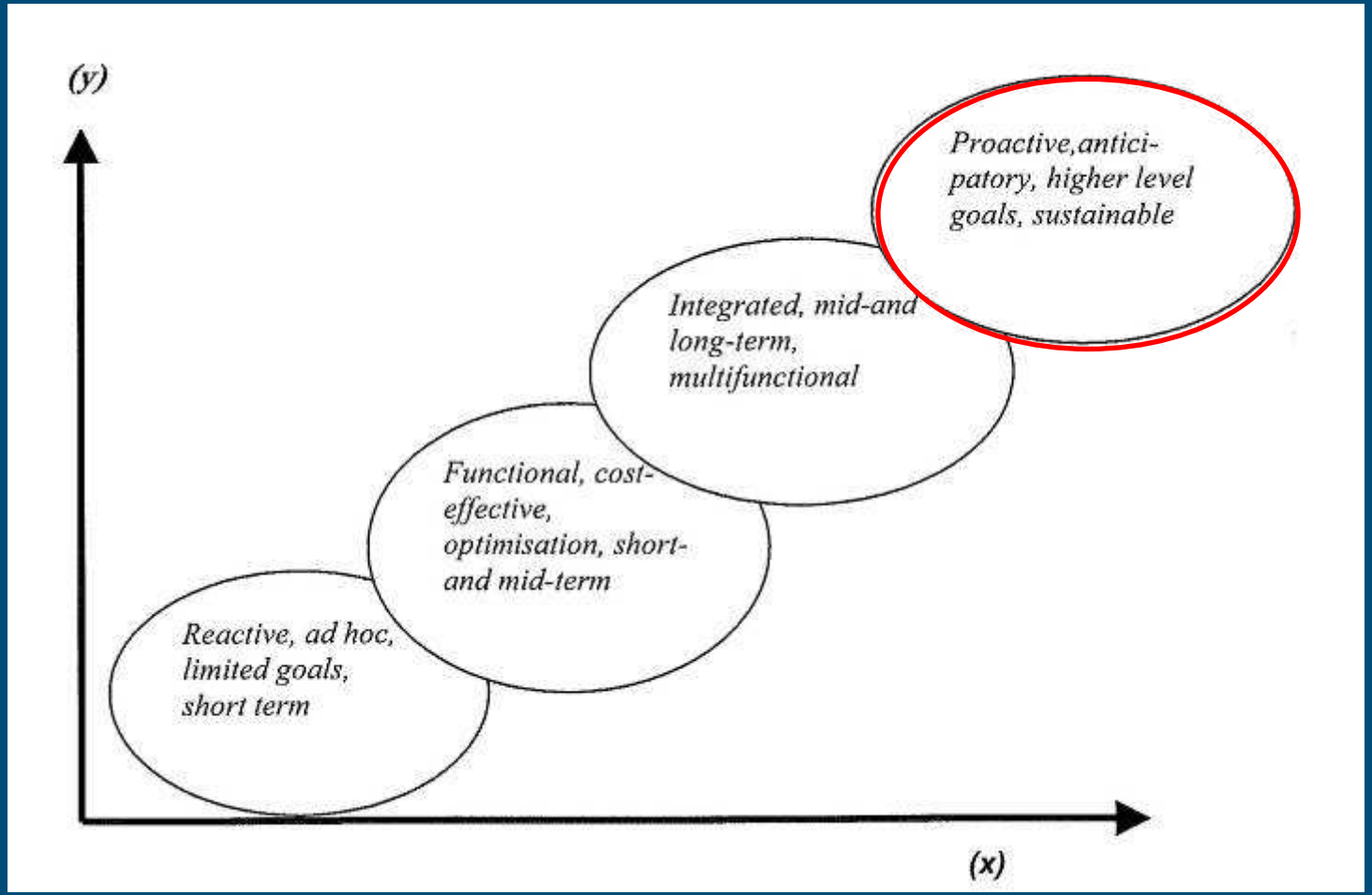
Gateway to the global garden, Roling, Hopper lecture 2000



Background 2000-2003

The unifying power of sustainable development, Slingerland et al 2003

Integration level



Time Space

INREF 2000 and 2006/2008

- Interdisciplinary Research and Education Fund
- Sandwich PhD students from the South and MSc students
- Problem oriented, interdisciplinary, participatory, strengthen institutional and human research, education and development capacity
- International peer review

INREF objectives

- Research results that make a difference to the end-users
- Innovative, interdisciplinary, comparitive
- Education programmes WU and partners
- Exploit international partnerships
- Attract additional funding
- Competitive

INREF programme structure

- Cohorts for joint training and exchange
- Concerted action to understand complex systems and problems
- Joint supervision with beta and gamma focus
- Disciplinary depth and interdisciplinary awareness combined: H-R-H
- New partnerships within and outside WU
- Regular reviews

INREF POND

- POND: Optimisation of nutrient dynamics and animals for integrated farming
- Quantification of nutrient dynamics in integrated agriculture-aquaculture farming systems and improvement from selected Tilapia fish
- 2000-2006

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INREF POND multilevel approach

- Fish genetics: Performance of Tilapia selection strains from poor and rich environments and suitability in the farming systems: nutrient dynamics and sustainability
- Pond system: role of pond in nutrient trapping and fish production and environmental impact at low and high inputs

INREF POND multilevel approach

- Farming system: Role of integrated aquaculture-agriculture systems and livelihood strategies in Vietnam
- Socio-economic context and decision making of farmers

INREF POND activities

- Eight PhD students: 3 African, 4 Asian, 1 Dutch
- Partners: Can Tho University, World Fish Centre Egypt , Wageningen University Graduate schools WIAS and PE&RC

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INREF POND OUTPUT

- 8 PhD theses and MSc theses
- refereed and other publications
- website
- symposium and proceedings Fishponds in farming systems (Wageningen Academic Publishers)
- conference contributions
- feedback to farmers, extensionists and policymakers

INREF Competing Claims 2006

- Competing claims on natural resources: overcoming mismatches in resource use through a multi-scale perspective
- Disciplines; animal, plant, environmental, social sciences

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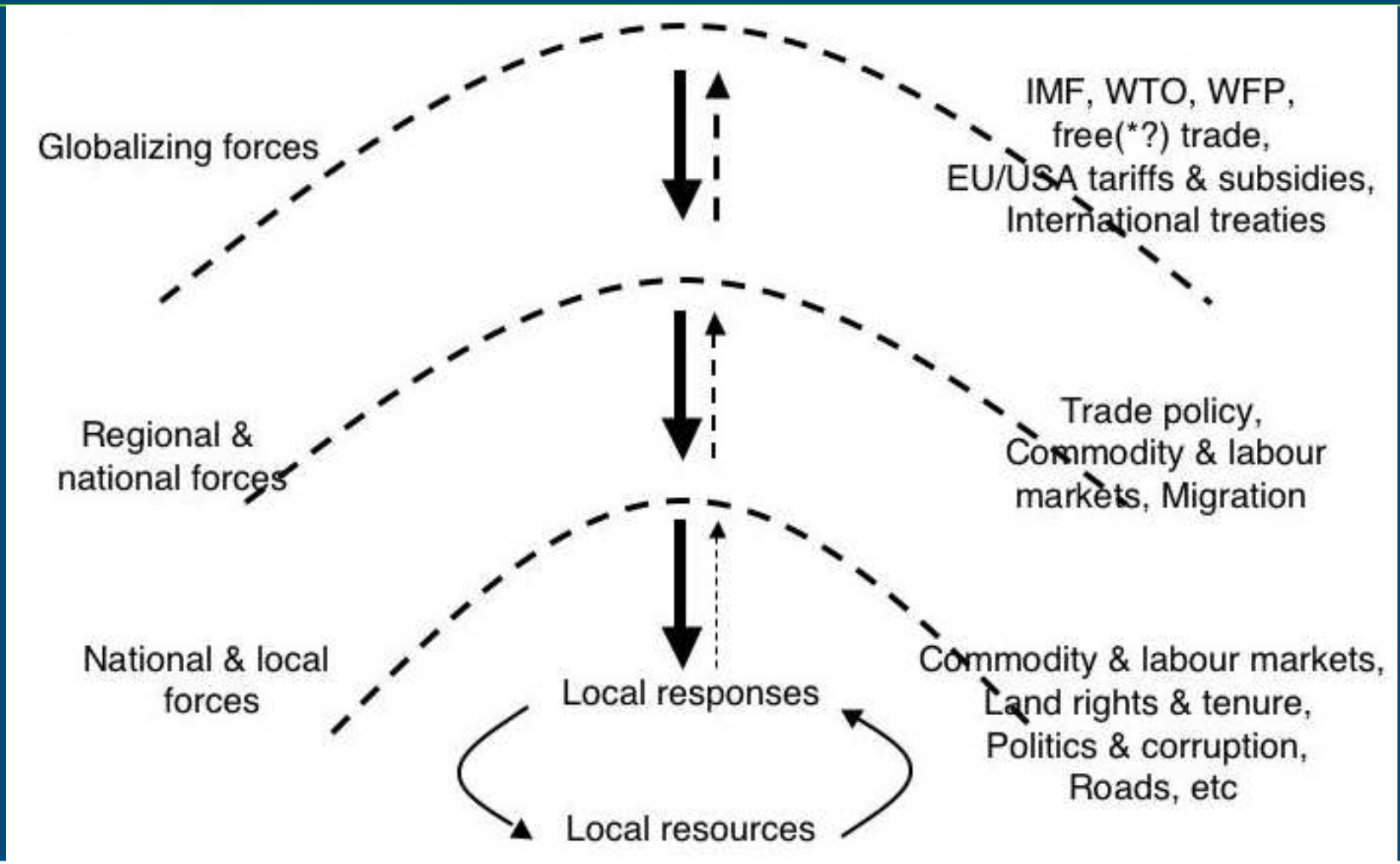
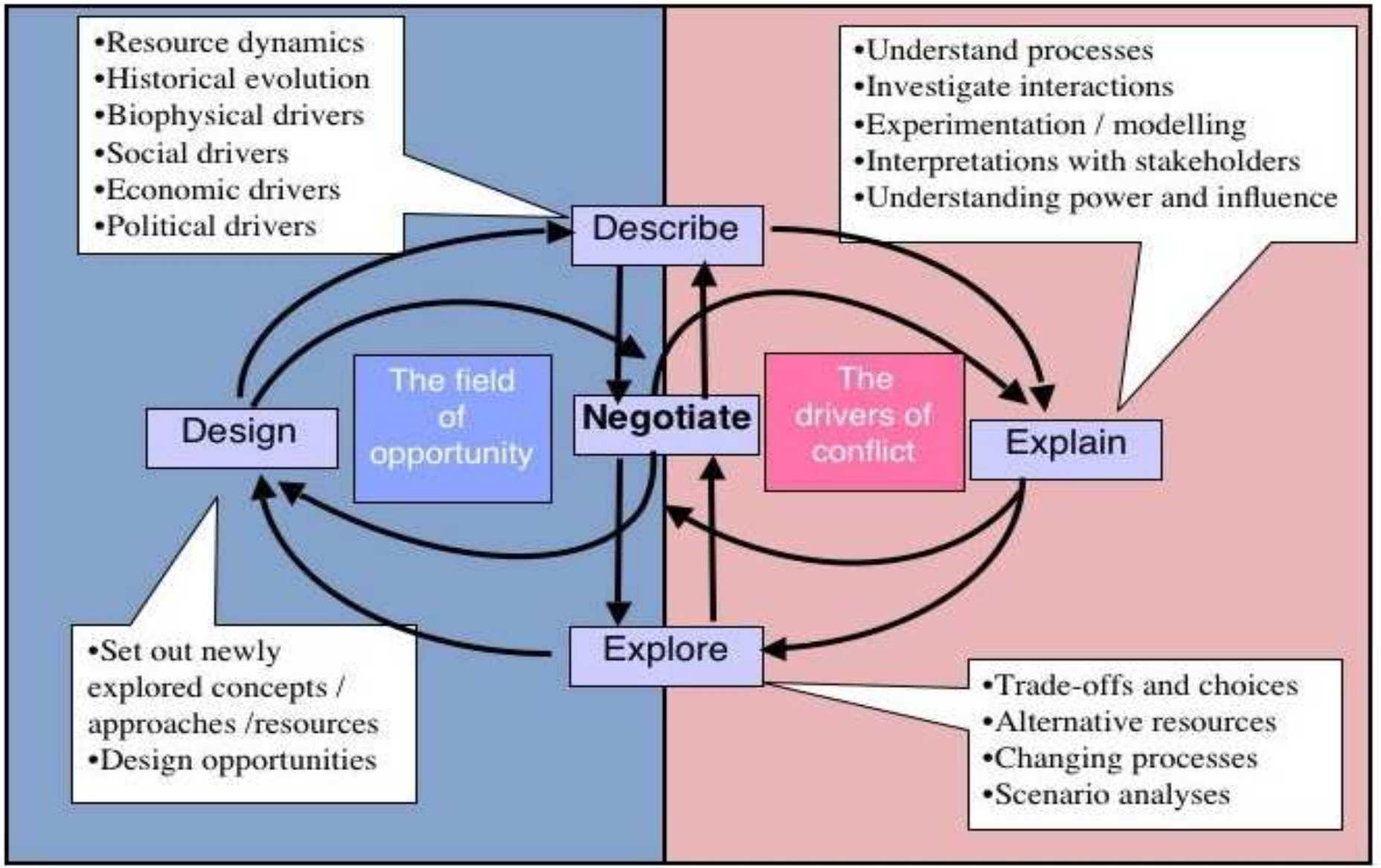
INREF C C 2006 SCALING

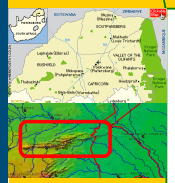


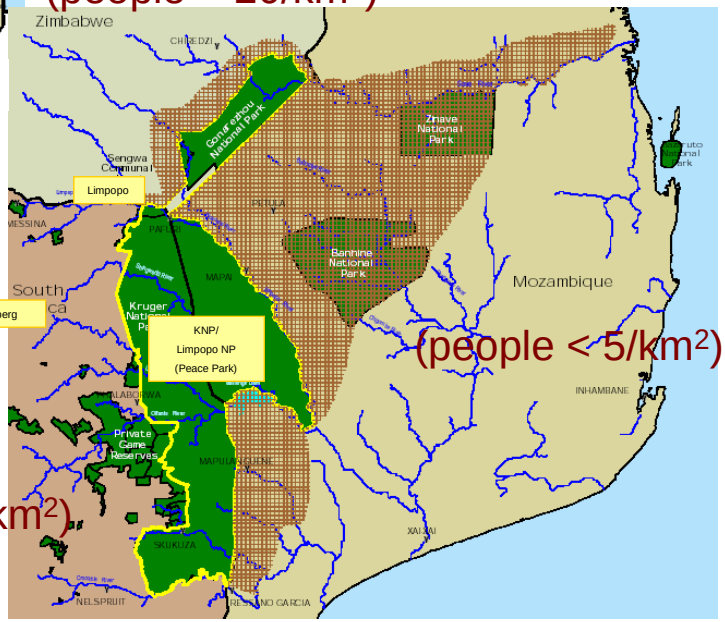
INREF C C 2006: DEED



INREF C C 2006: locations

CCNR focus area: southern Africa





(people = 20/km^2)

(people < 5/km^2)

(people = 40/km^2)

- South Africa: Soutpansberg, Levubu,Kruger
- Zimbabwe: SE lowveld,NE
- Mozambique: Gaza Prov.

INREF C C 2006 Partners

- Partnership with organisations in Southern Africa (ARC, Wits Univ, Pretoria Univ.; EMU, NGO; University Zimbabwe, Forestry Ministry Zimbabwe)

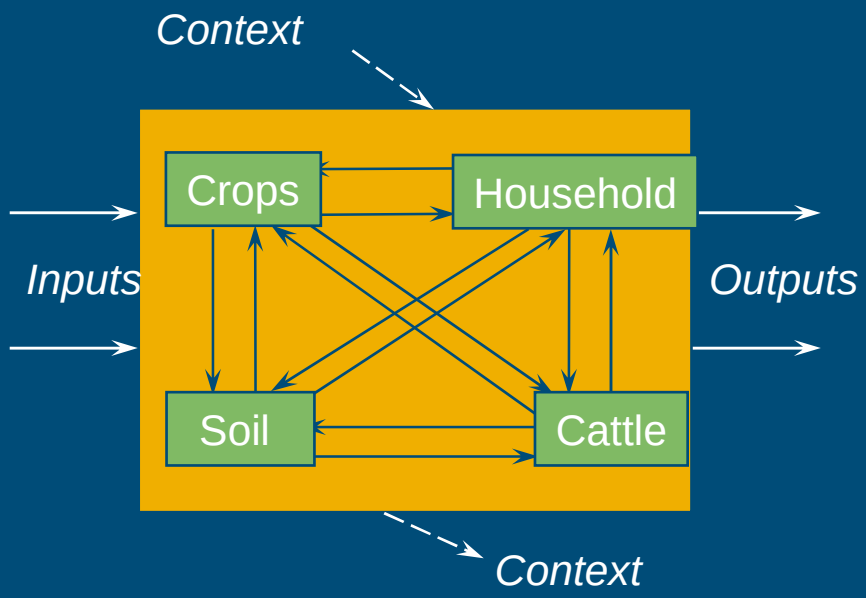
- 10 PhD students from Southern Africa

Systems approach APS: relevance

Step 1:
- Problem definition
- Delineation of the system
- Context

Step 2:
- In depth analysis of system components and interrelationships

Step 3:
- Interpretation of the results in relation to the context



Relevance for APS

- Toolbox of methods enlarged
- Sharing understanding, reflection, tools and skills of complex science
- Challenging teamwork skills
- Education: courses and MSc/PhD theses
- Generates new research questions, new projects

Multiple functions in agriculture

- Land: safety net, fuel wood, wild foods, construction material, medicine (Andersson et al 2007)
- Crops: food, feed, fuel, soil
- Fish ponds: water, fish, manure outlet-fertlisation for fish, sediment nutrients for crops, fruit trees (Nahn 2007, Phong 2007)
- Multipurpose trees: feed, soil and water, firewood, shade, construction material (Abebe 2007)
- Livestock: many

Multiple functions and drivers

- Multiple roles strenghten the (smallholder) farm and its livelihood: flexiblity, risk reduction and resilience
- Multiple roles are found in many farm components; expertise, markets and institutions for each determine the role in the farming system
- Maintaining resilience versus higher cash income from livestock depends on market opportunities, reliable institutions and labour alternatives

WU Platform for Sustainable Development and Food Security

An initiative by...

Tiny van Boekel
Product design & quality management

Ken Giller
Plant production systems

Arnold van Huis
Entomology

Herman van Keulen
Plant science

Cees Leeuwis
Communication science

Tuur Mol
Environmental policy

Anke Niehof
Sociology of consumers and households

Rudy Rabbinge
Sustainable development & systems innovation

Paul Struik
Plant science

Paul Richards
Technology & agrarian development

Tom Veldkamp
Soil science & geology

Leontine Visser
Rural development sociology

Johan Verreth
Aquaculture & fisheries

Thea Hilhorst
Rural development sociology

Akke vd Zijpp
Animal production systems

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Wageningen approach: continuity assured

- Interdisciplinary research
- Co-operation with stakeholders

- Co-operation with Southern partner institutes
- Cohorts of sandwich PhDs
  - *Joint learning*
  - *Capacity building*

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Why a new platform

- Challenges research
  - **Upscaling** (In some regions, complex interactions hamper the implementation of research results)
  - **Deepening** (Some problems ask for deeper interdisciplinary integration, also at the conceptual level)
  - **Integration in course program**
- Need for transdisciplinary visions as framework for research & teaching
  - **Earlier initiatives:** Wageningen Platform for Food Security; Interdisciplinary workshops Wageningen International; Working Group for Sustainable Development & Systems Innovation; etc.

Platform aims

- Development of coordinated research activities & transdisciplinary visions

  Two focal problems

  - The social and ecological unsustainability spiral in low-income countries and less-favoured areas
  - Global food supply in the long term
- Integration of transdisciplinary insights in course program
- Organization of WUR-wide discussions

Websites

- www.aps.wur.nl/uk
- www.wi.wur.nl/UK/services/