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Instruments for Competing Claims on Natural Resources

A preliminary assessment of KB 2011 projects

Projects KB-11-001-004 & KB-16-001.01-001

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Contents

1. Introduction

1.1 Terms of reference

This report results from the project 'Competing Claims on Natural Resources (overkoepelend instrumentarium)' in the KB programme of 2011. In short the terms of reference of this report are as follows: Give an overview of instruments developed in other KB projects relevant for the analysis of Competing Claims on Natural Resources. Questions include:

- What are feasible instruments?
- What are their advantages and disadvantages?
- What can or should be applied in specific cases?
- Is there a need to validate instruments and how?
- Can the instruments help to make trade-offs clearer on a global, national and local level?
- What are the white areas (not covered)? What should be developed?

1.2 Natural Resources

This report is about competing claims on natural resources. The term natural resources covers different types of resources, such as environmental media, flow resources, raw materials, biodiversity and space. A rough specification is given below (figure 1).

Resource	Description
Environmental media	Soil, water and air
Flow resources	Wind, geothermal, tidal and solar energy
Raw materials	Minerals (non-renewable) and biomass (renewable)
Biodiversity	Diversity within species, between species and of ecosystems
Space	Areas for human activities and nature

Figure 1: Types of natural resources

The world is full of competing claims on natural resources and the issues are investigated in many scientific disciplines. The issues are at the core of the environmental and resource economics discipline (scarcities). Also other social sciences (sociology, public administration) deal with the issues. In this report we focus on competing claims situations that are problematic in terms of sustainability and equity.

1.3 Approach

We have taken the so called NE-DEED framework as the starting point of our approach.

NE-DEED stands for: Negotiation, Describe, Explain, Explore and Design. See figure 2, taken from the conceptual framework developed by Giller et al.

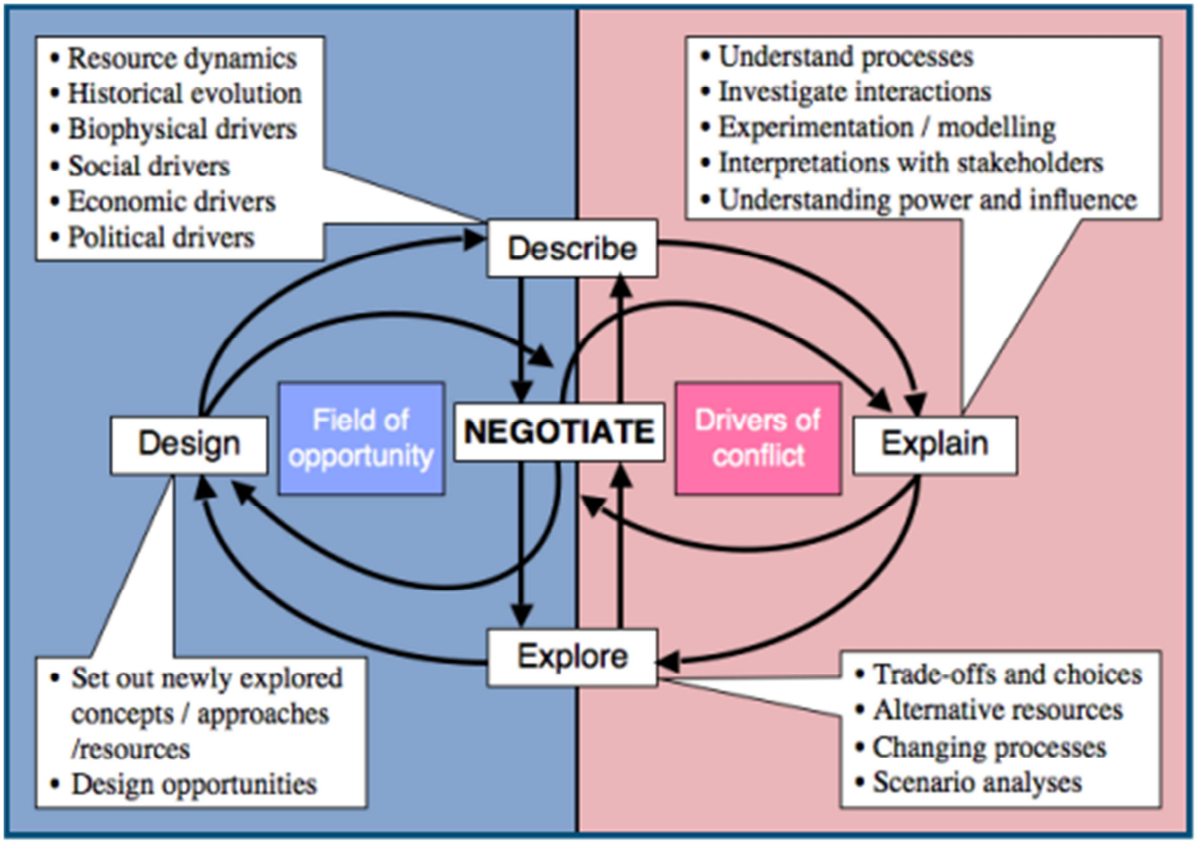


Figure 2: Conceptual framework for Competing Claims on Natural Resources

From the projects in KB 2011 we selected those of which we assumed had one or another relation with Competing Claims. We interviewed the leaders or key researchers of these projects. Afterwards we tried to categorise the different projects/instruments according to the NE-DEED framework and also according to the claims that are being dealt with.

1.4 Structure of the report

Chapter 2 provides a synthesis of the KB projects, based on the interviews. In chapter 3 our preliminary findings are formulated and in chapter 4 our recommendations.

The selected projects are described in Annex 1. The tools and models which are used and developed in the projects are listed in Annex 2. The INREF programme Competing Claims on natural resources is introduced in Annex 3.

2. Relevant KB-initiatives for 'Competing Claims'

Projects relevant for Competing Claims on natural resources are found in KB 11, 12, 13, 14 and 16.

In KB 11 – Global Food Security:

- One project is intended as an umbrella for Competing Claims and for the development of an umbrella website for competing claims.
- Under the 'Scenarios and models for food security' project the 'Food secure' proposal will be developed for global level. It is an EU project with KB 11 co-financing in development. Modelling, simulation, stakeholders are important aspects.
- One project focuses on modelling of increased food security with less water use in watersheds.
- One project is about the production of maps on actual and potential agricultural productivity, indicating yield gaps.
- One project focusses on the round table for palm oil as a mechanism to bring stakeholders in the chain together in order to improve sustainability.
- One project focuses on Participatory Action Research at the local level in Africa.
- One project focuses on bringing nutrition aspects into agricultural value chain development.

KB 12 – Sustainable agricultural value chains

- Two projects focus on Value Chain Analysis (with underlying Life Cycle Analysis) in order to support and improve 'sustainability' initiatives and performance of companies and of agricultural producers.
- One project focuses on modelling and analysing different policy options for dairy production ('mega-stables') in provinces in The Netherlands.

KB 13 – Bio-based Economy

- One project is a cross-sectoral risk-economic comparison of bio-based initiatives in The Netherlands. It analyses different options for chain development of bio-energy in The Netherlands.
- Another project ('Biomass futures') is about estimation of potentials of all biomass types in agriculture, forestry, debris, their spatial dispersion etc., all in relation to the EU policy on renewable energy.
- One project concerns the development of a new variety of Jatropha.

KB-14: Sustainable development of the blue and green space

- The selected projects focus on ex-ante impact assessment of different land use policies. One framework for integrated assessment (LUPIS) focusses on developing countries. Another one on The Netherlands and one focusses on the sea.

KB-16: Transition, innovation and behaviour:

- Two projects focus on competing claims, applied in a specific sector, visually the sea and coastal sectors.

In KB 15 and 17 no projects for Competing Claims have been identified. KB 15 is on healthy and safe food and there are no projects with clear links to Competing Claims. KB 17 is about technology development, with ICT, genomics and nano-technology. In principle new technology developments can diminish pressure on the use of resources, so there is always a link with Competing Claims. However, we consider this link too remote to be taken into consideration here.

3. Findings

3.1 Introduction

We have put our categorization in a mind map. We used the Ne-DEED framework to categorize:

- Negotiation
- Describe
- Explain
- Explore
- Design

We made a further subdivision of the design category, based on the Competing Claims categorizations of possible interventions given in the competing claims website http://www.competingclaims.wur.nl/UK/:

- Regulatory approaches
- Market incentives
- Innovation
- Capacity building

As a second exercise we tried to group the different instruments according to the specific competing claims addressed in the tool, or the trade-offs that are dealt with and tried to formulate some conclusions. See the second mind map.

For both categorisations also a mind map has been made. See the figures.

3.2 Using the Competing Claims NE-DEED framework

3.2.1 General

- In the different KBs there are a considerable number of projects relevant for Competing Claims on natural resources. This is an encouraging observation, since in most KBs no specific efforts have been made to promote the issue of Competing Claims as such.
- It was difficult and arbitrary to put many tools, especially the models, in only one category of the NE-DEED framework: Describe, Explain, Explore and Design. The NE-DEED framework itself is not fully clear in that respect. Under 'describe' several *drivers* of competition are to be identified. This deals necessarily with cause-effect relations, and therefore to some extent with 'explanation'. In practice, many of the reviewed projects and tools deal with Describe, Explain and Explore. So we combined these categories.
- It is difficult to evaluate from the outside the feasibility of the different instruments. One way would be to dig much more into the practicalities of each instrument. It is also difficult to compare the different models as to their quality, because generally they work at different levels or focus on different sectors.
- There are several instruments for analysis, for scenarios etc., even for negotiation and design of solutions, but there is no approach from start to finish, or a kind of menu to be used for different situations and levels. As WUR we are not yet able to offer a package that deals with all the aspects of Competing Claims. If we could offer such a package, this would probably be an asset.

3.2.2 Describe, Explain and Explore

Models

- Much emphasis in the different KBs is on model development. From a Competing Claims perspective there may be too much emphasis on models and on the exploration phase in

general. Model development is mainly driven by EU. Co-financing of EU-projects is a driving factor. So many models were originally developed for EU level. This is due to the fact that agricultural and other policies are formulated at the EU level and the EU needs impact assessments to judge ex-ante what the different policy options would imply.

- The models do cover many levels: global, European, national/provincial, coasts and sea and watersheds. And many topics; dairy, natural resources, biomass production, agriculture and food security. Interaction between developers of the models inside WUR seems to be limited; model development often happens in EU projects with different partners in the EU.
- The different models can surely help to make trade-offs clearer on global, national and local level. However, the global level is sparsely represented, so 'leakage' is a risk. For example: we can optimise biofuel production within Europe, but it may result in shift of production of certain food crops to other areas outside the EU which may cause much emission of greenhouse gases.
- There are quite some models which aim at presenting policy options. However, institutional aspects are weakly represented, especially in scenario building. There is a gap between description and modelling of trends, drivers and forces at the one hand and the institutional situation in a country or region at the other hand. Certain international trends may work out completely different than expected because of institutional hindrances. This notion can be integrated to a certain extent in models, but this issue would need more attention.
- Models are developed from the scientists point of view and not always focused on the direct demand of the policy-maker. Keeping contact with relevant policy makers seems to be of utmost importance in order to make models 'useful' for solving concrete problems of Competing Claims.
- The different models do not have a standard way to connect or communicate to and with each other. Probably this is not possible but it would be worthwhile to find ways to facilitate easier communication between the models and the people behind them.
- Some researchers note that WUR is losing its position to other European players when it comes to the development of models. This situation may call for more cooperation between model developers in the different institutes (LEI, Alterra and PRI).
- Behind the projects and models in development there are 'older' models and tools, some of which are described briefly in annex 2.
- Many models are used for exploring different policy options. The actual implementation of regulations and other policies receives little attention.

Value chain analysis

- Value chain analysis for improving sustainability could be identified as a separate category. It is also represented by way of instruments to measure sustainability of products or companies. And in biomass production for energy generation. It is not clear to what extent there is a connection between models for spatial development and models for value chain analysis.

Participatory action research

- The project JOLISAA deals with participatory action research. In fact it not only describes, explains and explores options, but it also designs solutions in a negotiation process. That is why in the figure the project is mentioned twice. The limitation is that it functions at the local level. Maybe the research on the round table for palm oil, could use research tools developed at the local level across different levels in the value chain.

3.2.3 Design / interventions / negotiation

- This is a part of the NE-DEED framework with relatively few efforts in KB-projects. For example, many models deal with exploring different policy options, but do not deal with the actual (monitoring of the) implementation of such options. It is debatable where we should draw the line here, because some interventions are very practical.
- In our figure we used a categorisation in: regulatory approaches, market incentives, innovation and capacity building:
    - **Regulatory approaches**. There is one project that deals with regulatory approaches in practice, in Mozambique. The focus on the regulatory approach can partly be explained by the personal interest of the scientist, and not so much because his PhD

supervisors urged him to do so. This goes beyond making scenarios for different policy options (quite a common practice in development of models). Part of another KB project deals with Forest Governance Monitoring.
    - One of the intervention methods are **market incentives**. The category as such could be considered to be a sub-category of regulatory approaches. However, market arrangements can in principle be developed by market parties completely outside the government. An example of a market incentive is Payment for Environmental Services (PES). We have found no KB projects in this category. However, in several models environmental services are taken into consideration and valorised, but bringing this into the design of a payment mechanism seems to be out of scope.
    - One would expect that many technical **innovations** under KB would be useful within a Competing Claims framework. In principle, any project trying to improve productivity could help to alleviate competing claims. It does not seem useful to mention such efforts under the heading of Competing Claims. The KB project on Jatropha is an effort to make a crop useful both for energy production and fodder, in order to alleviate the competing claims between energy and food/feed. This is surely an innovation. The project on agriculture-nutrition linkages tries to bring nutrition into value chain development.
    - **Capacity building** within Competing Claims is not a subject for research. However it would be interesting to learn more about the impact of capacity building
- Few efforts are made in KB to investigate (and improve) the negotiation process around Competing Claims at different levels (local, national, international, value chains). Methodologies to do this are not so obvious.

3.3 Using the different claims as starting point

We have categorised the competing claims into 8 different groups:

1. Spatial planning and use of land resources
2. Spatial planning for resources at sea and in coastal zones
3. Life cycle analysis for sustainable production
4. Claims between different geographical and administrative levels
5. Planning of use of water
6. Claims of different stakeholders on goods and services of the forests
7. Global or international aspects of agricultural production versus other uses
8. Biomass production versus other resource use.

Some instruments are developed and/or applied in more than one category.

3.3.1 Spatial planning and use of land resources

Here are instruments focussing on land use and claims on land resources in general at area level, like LUPIS (14.3) and Scenarios and models for food security (11.5). There are also instruments that put agriculture more in the centre: More food on smaller foot (11.6) and Global Spatial Framework for agricultural productivity (11.3). Some put specific uses in the centre: the DPSIR methodology (11.1) puts biodiversity and ecosystems at the centre, while Knowledge framework for sustainable land (12.2) puts livestock farming at the centre, and Methods for sustainable area development (14.1) compares agricultural businesses with other businesses. The total picture seems to be pretty complete.

3.3.2 Spatial planning for resources at sea and in coastal zones

There is one project specifically focusing on coastal zones (CO-EXIST, 14.2) and two on spatial planning at sea: MASPNOSE (16.1) focuses on national planning versus the need to cooperate at EU level and Sea at Sight (16.2) will deal with different uses of the sea.

3.3.3 Life cycle analysis for sustainable production

Here are two instruments to improve the sustainability of production of products taking into account the resources used in the whole commodity value chain. The projects are Monitoring and evaluation of sustainability (12.1) and Development of instruments for estimation of sustainability of agricultural value chains (12.2).

3.3.4 Claims between different geographical and administrative levels

In this category the focus is on claims on resources coming from different levels. The resources at stake can be:

- Natural resources in general and the national and local claims and rights on these (JOLISAA, 11.4),
- Biofuels and donor demands/international criteria versus national contextualisation (Biofuel developments in Mozambique: policy, potential and reality, 14.4)
- Agricultural products for balanced nutrition of local populations versus production for the market (agriculture-nutrition linkages, 11.7)
- Space and resources at sea: national planning verus the need to plan space at the North Sea at an integrated EU level (MASPNOSE, 16.1)

3.3.5 Planning of use of water

In fact there is only one project that specifically focusses on competing claims on water. It is the More food on smaller foot (11.6) project. It focuses on questions like water for agriculture or biodiversity and on optimisation of water use in a watershed. In the Global Spatial Framework for Agricultural Productivity (11.3) use of water versus use for other purposes is taken into account. It is not clear to what extent water is taken into account in the various instruments under spatial planning and use of land resources (3.2.1).

3.3.6 Claims of different stakeholders on goods and services of the forests

There is one project focusing on this issue: Forest Governance monitoring under the Competing Claims and governance of natural resources project (11.1). The idea in this project is to promote governance of forests by introducing ways to monitor forest governance aspects. The idea is that the way this monitoring would be set up, could also create lessons learned for other sectors in need of improved governance. The claims dealt with are most of all between different stakeholders struggling for goods and services from the forest. However, forest governance can also regulate claims from other sectors on forest land, to be converted into for example agricultural land.

3.3.7 International claims on agricultural production

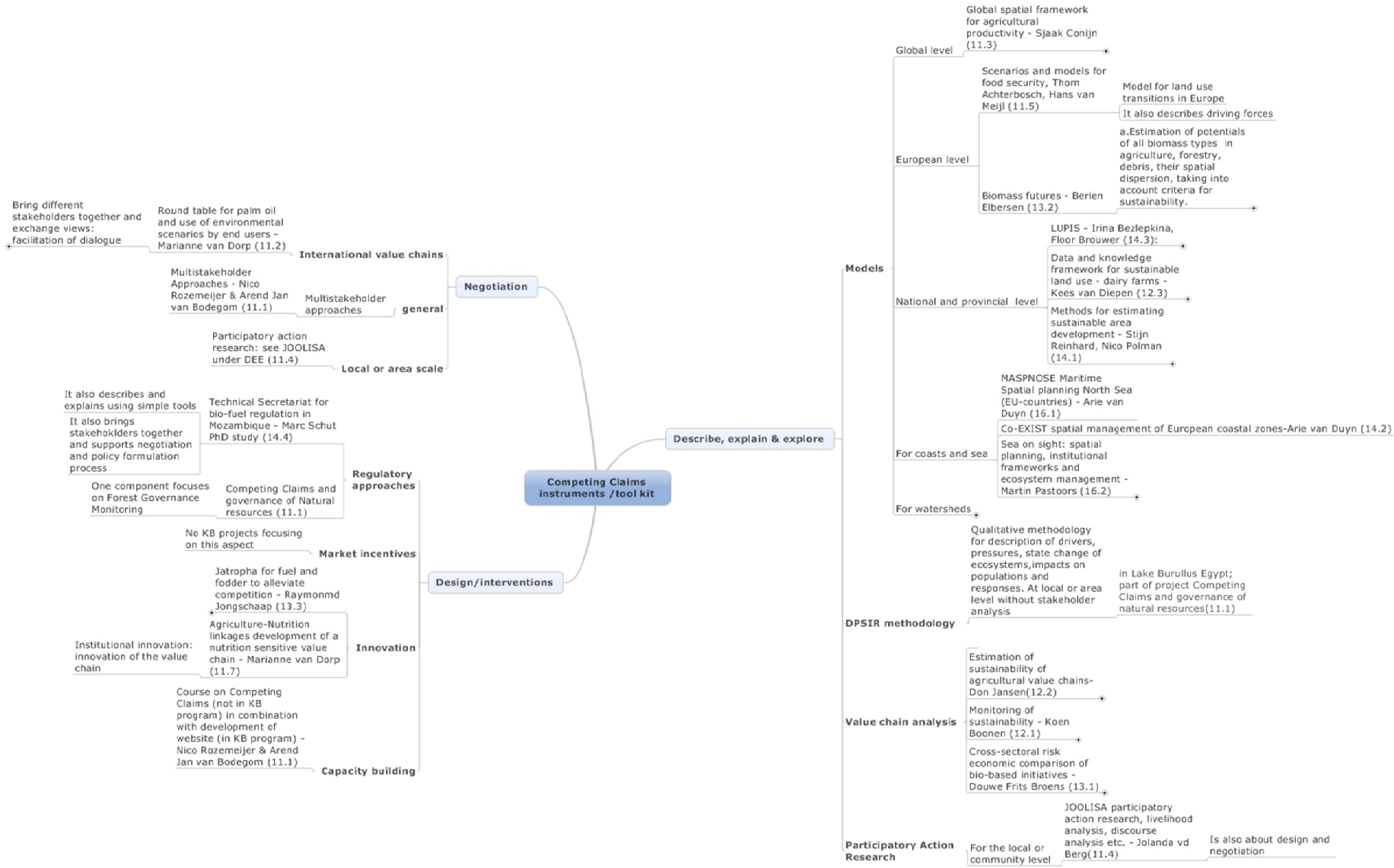
Under this heading we group the following:

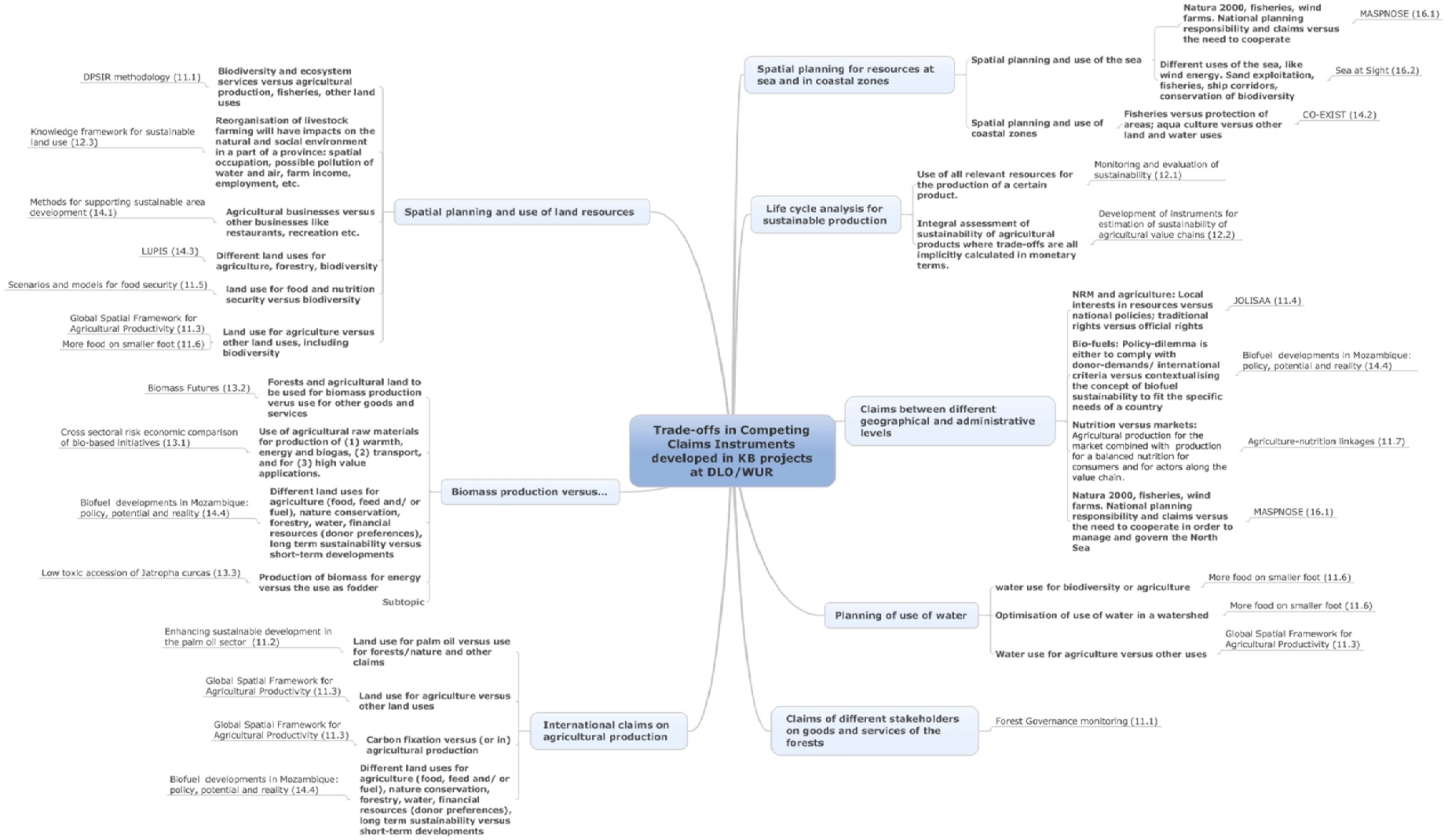
- Production of biomass of Jatropha for biomass (energy) versus the use of Jatropha as fodder. Instrument 13.3 tries, through innovation, to combine both uses in one variety.
- Land use for palm oil versus the use for forests/nature and other claims. The Round table for palm oil is the instrument (11.2).
- The Global Spatial Framework for agricultural Productivity (11.3) produces maps on a global scale with potential productivity and consequences for water use and carbon fixation.
- The Biofuel development initiative (14.4) fits also under this heading because it tries to deal with international and national claims for biofuels and the criteria under which they should be produced.

3.3.8 Biomass production versus other resource use

This category is represented by several instruments:

- Forests and agricultural land to be used for biomass production, versus use for other purposes in Europe (Biomass futures, 13.2).
- Within the biomass sector, there are partially competing claims on raw materials for either production of warmth/energy, or transport, or high value applications (Cross-sectorial risk economic comparison of bio-based initiatives (13.1) .
- The already mentioned Biofuel Development Initiative in Mozambique (14.4) deals with planning for biofuel production at national scale versus other uses.


Competing Claims instruments /tool kit
Describe, explain & explore
Models
Global level
Global spatial framework for agricultural productivity - Sjaak Conijn (11.3)
European level
Scenarios and models for food security, Thom Achterbosch, Hans van Meijl (11.5)
Model for land use transitions in Europe
It also describes driving forces
Biomass futures - Berien Elbersen (13.2)
a.Estimation of potentials of all biomass types in agriculture, forestry, debris, their spatial dispersion, taking into account criteria for sustainability.
National and provincial level
LUPIS - Irina Bezlepkina, Floor Brouwer (14.3):
Data and knowledge framework for sustainable land use - dairy farms - Kees van Diepen (12.3)
Methods for estimating sustainable area development - Stijn Reinhard, Nico Polman (14.1)
For coasts and sea
MASPNOSE Maritime Spatial planning North Sea (EU-countries) - Arie van Duyn (16.1)
Co-EXIST spatial management of European coastal zones-Arie van Duyn (14.2)
Sea on sight: spatial planning, institutional frameworks and ecosystem management - Martin Pastoors (16.2)
For watersheds
DPSIR methodology
Qualitative methodology for description of drivers, pressures, state change of ecosystems,impacts on populations and responses. At local or area level without stakeholder analysis
in Lake Burullus Egypt; part of project Competing Claims and governance of natural resources(11.1)
Value chain analysis
Estimation of sustainability of agricultural value chains- Don Jansen(12.2)
Monitoring of sustainability - Koen Boonen (12.1)
Cross-sectoral risk economic comparison of bio-based initiatives - Douwe Frits Broens (13.1)
Participatory Action Research
For the local or community level
JOOLISA participatory action research, livelihood analysis, discourse analysis etc. - Jolanda vd Berg(11.4)
Is also about design and negotiation
Design/interventions
Regulatory approaches
It also describes and explains using simple tools
It also brings stakeholklders together and supports negotiation and policy formulation process
Technical Secretariat for bio-fuel regulation in Mozambique - Marc Schut PhD study (14.4)
One component focuses on Forest Governance Monitoring
Competing Claims and governance of Natural resources (11.1)
Market incentives
No KB projects focusing on this aspect
Innovation
Jatropha for fuel and fodder to alleviate competition - Raymonmd Jongschaap (13.3)
Institutional innovation: innovation of the value chain
Agriculture-Nutrition linkages development of a nutrition sensitive value chain - Marianne van Dorp (11.7)
Capacity building
Course on Competing Claims (not in KB program) in combination with development of website (in KB program) - Nico Rozemeijer & Arend Jan van Bodegom (11.1)
Negotiation
International value chains
Bring different stakeholders together and exchange views: facilitation of dialogue
Round table for palm oil and use of environmental scenarios by end users - Marianne van Dorp (11.2)
Multistakeholder approaches
general
Multistakeholder Approaches - Nico Rozemeijer & Arend Jan van Bodegom (11.1)
Local or area scale
Participatory action research: see JOOLISA under DEE (11.4)


Trade-offs in Competing Claims Instruments developed in KB projects at DLO/WUR
Spatial planning and use of land resources
Biodiversity and ecosystem services versus agricultural production, fisheries, other land uses
DPSIR methodology (11.1)
Reorganisation of livestock farming will have impacts on the natural and social environment in a part of a province: spatial occupation, possible pollution of water and air, farm income, employment, etc.
Knowledge framework for sustainable land use (12.3)
Agricultural businesses versus other businesses like restaurants, recreation etc.
Methods for supporting sustainable area development (14.1)
Different land uses for agriculture, forestry, biodiversity
LUPIS (14.3)
land use for food and nutrition security versus biodiversity
Scenarios and models for food security (11.5)
Land use for agriculture versus other land uses, including biodiversity
Global Spatial Framework for Agricultural Productivity (11.3)
More food on smaller foot (11.6)
Biomass production versus...
Forests and agricultural land to be used for biomass production verus use for other goods and services
Biomass Futures (13.2)
Use of agricultural raw materials for production of (1) warmth, energy and biogas, (2) transport, and for (3) high value applications.
Cross sectoral risk economic comparison of bio-based initiatives (13.1)
Different land uses for agriculture (food, feed and/ or fuel), nature conservation, forestry, water, financial resources (donor preferences), long term sustainability versus short-term developments
Biofuel developments in Mozambique: policy, potential and reality (14.4)
Production of biomass for energy versus the use as fodder
Low toxic accession of Jatropha curcas (13.3)
Subtopic
International claims on agricultural production
Land use for palm oil versus use for forests/nature and other claims
Enhancing sustainable development in the palm oil sector (11.2)
Land use for agriculture versus other land uses
Global Spatial Framework for Agricultural Productivity (11.3)
Carbon fixation versus (or in) agricultural production
Global Spatial Framework for Agricultural Productivity (11.3)
Different land uses for agriculture (food, feed and/ or fuel), nature conservation, forestry, water, financial resources (donor preferences), long term sustainability versus short-term developments
Biofuel developments in Mozambique: policy, potential and reality (14.4)
Spatial planning for resources at sea and in coastal zones
Spatial planning and use of the sea
Natura 2000, fisheries, wind farms. National planning responsibility and claims versus the need to cooperate
MASPNOSE (16.1)
Different uses of the sea, like wind energy. Sand exploitation, fisheries, ship corridors, conservation of biodiversity
Sea at Sight (16.2)
Spatial planning and use of coastal zones
Fisheries versus protection of areas; aqua culture versus other land and water uses
CO-EXIST (14.2)
Life cycle analysis for sustainable production
Use of all relevant resources for the production of a certain product.
Monitoring and evaluation of sustainability (12.1)
Integral assessment of sustainability of agricultural products where trade-offs are all implicitly calculated in monetary terms.
Development of instruments for estimation of sustainability of agricultural value chains (12.2)
Claims between different geographical and administrative levels
NRM and agriculture: Local interests in resources versus national policies; traditional rights versus official rights
JOLISAA (11.4)
Bio-fuels: Policy-dilemma is either to comply with donor-demands/ international criteria versus contextualising the concept of biofuel sustainability to fit the specific needs of a country
Biofuel developments in Mozambique: policy, potential and reality (14.4)
Nutrition versus markets: Agricultural production for the market combined with production for a balanced nutrition for consumers and for actors along the value chain.
Agriculture-nutrition linkages (11.7)
Natura 2000, fisheries, wind farms. National planning responsibility and claims versus the need to cooperate in order to manage and govern the North Sea
MASPNOSE (16.1)
Planning of use of water
water use for biodiversity or agriculture
More food on smaller foot (11.6)
Optimisation of use of water in a watershed
More food on smaller foot (11.6)
Water use for agriculture versus other uses
Global Spatial Framework for Agricultural Productivity (11.3)
Claims of different stakeholders on goods and services of the forests
Forest Governance monitoring (11.1)

4. Recommendations

1. **Tool box for dealing with Competing Claims**. In this overview many tools for dealing with competing claims have been presented. It is recommended to make clear to outsiders under what circumstances which instruments are the most appropriate.
2. **More cooperation.** Several project managers have expressed their willingness to be mentioned on the competing claims website. This is a starting point. Between KB projects more cooperation is possible and useful. In the separate project sheets some options are provided.
3. **Impact measurement.** It would be important to think about the impact of the different instruments in development under the KB projects on Competing Claims issues and situations. How could we measure such impact?
4. **Design and negotiation**. Relatively few efforts are dealing with the Design phase of the NE-DEED framework and with the negotiation process. These phases in the framework may require more research attention.
5. **Governance issues**. The history of mankind is full of struggles about Competing Claims on natural resources. Often such competition has been 'solved' using 'naked' economic power, brutal force or even war. The fact that science is dealing within KB with the subject of Competing Claims, indicates that there is a desire to solve Competing Claims in rational, non-violent ways. In many ways this means that governance of natural resources has to be improved, also taking into account unequal distribution of power and access to resources. Governance issues also imply *institutional aspects*. In general the integration of institutional aspects needs more attention from researchers. Institutional aspects are perhaps more the realm of the 'practitioners' from CDI than of researchers from other science groups. However, in the LUPIS project on integrated assessment of land use policies, the importance of institutional aspects and governance issues has been clearly demonstrated.
6. **Models**. It would be wise to discuss with model developers and policy makers how the use of modelling frameworks can be increased. Some projects pay much attention to application of models in concrete situations and contacts with stakeholders. However, it is recommended that this practice becomes more widespread. The link between information and the process of decision-making needs more attention. There is a need to develop models dealing with institutional aspects to fill the gap between anonymous drivers of change and competition at the one hand and concrete stakeholders and their interests and power at the other hand. Multi-agent modelling, which is also receiving attention in IP/OP, could play a role here. So there is a need to connect with IP/OP.
7. **Integrated technical and institutional solutions for Competing claims**. It is plausible that the need to develop solutions on the brink of energy and food/feed/nutrition will grow, solutions that give an answer to several challenges of competing claims at the same time. So KB research should try to stimulate such synergies.
8. **From tools and methods towards sustainable policy instruments.** In formulating policy instruments for sustainable development, an integrated forward looking approach is needed. The experiences of LUPIS project advocate an integrative way of research, combining scenario analyses, requiring a good mix of disciplines, addressing multi-scales of assessment and indicating the timing of stakeholder involvement.
9. As to the actual **competing claims** dealt with in the different KB projects, it is recommended to pay more attention to:
    a. **Water**: given the future increasing shortage of water of acceptable quality and the importance of water in Dutch policies competing claims on water resources would merit more attention in KB research.
    b. **Energy** in relation to agriculture and management of sea or land areas is an upcoming issue and maybe more efforts are necessary here.
    c. The **global** level is relatively sparsely represented in the research and needs more attention. Some examples with clear linkages to global food security:

i. The global scarcity of **phosphate** in the near future and ways how to deal with competing claims on this resource. Phosphate is an essential input for agricultural production.
ii. **International land acquisition** (sometimes called 'land grabbing'), either for biomass, or food security purposes of foreign countries. This is an upcoming issue, especially in Africa, for example in Mali. Please note that on the website www.competingclaims.wur.nl (managed with KB funding) in 2011 some pages will be dedicated to this issue.
iii. Competing claims between **domestic fisheries for inland consumption versus large scale fishing** by national and international companies for export to Europe, USA or Japan.

Annex 1: Assessed CC Projects in KB 2011

KB		Project	Project manager	Inst.
11	1	Competing claims on and governance of natural resources Part 1, 2 and 3	Arend Jan van Bodegom	CDI
	2	Sustainable chains/sustainable palm oil	Marianne van Dorp	CDI
	3	Global Spatial Framework for Agricultural Productivity	Sjaak Conijn	PSG
	4	JOLISAA	Jolanda van den Berg	LEI
	5	Scenarios and models for food security	Thom Achterbosch/ Hans van Meijl	LEI
	6	More food on smaller foot	Herco Jansen	ESG
	7	Agriculture-nutrition linkages	Marianne van Dorp	CDI
12	1	Monitoring and evaluation of sustainability	Koen Boone	LEI
	2	Development of instruments for estimation of sustainability of agricultural value chains	Don Jansen	PSG
	3	Knowledge framework for sustainable land use	Kees van Diepen	ESG
13	1	Cross sector risk-economic comparison of biobased initiatives	Douwe Frits Broens	LEI
	2	Biomass Futures	Berien Elbersen	ESG
	3	Low toxic accession of Jatropha curcas	Raymond Jongschaap	PSG
14	1	Methods for supporting sustainable area development	Stijn Reinhard	LEI
	2	CO-EXIST	Arie van Duijn	LEI
	3	LUPIS	Irina Bezlepkina (co-leader)	LEI
	4	Biofuel developments in Mozambique: policy, potential and reality	Marc Schut	DSS
16	1	MASPNOSE	Arie van Duijn	LEI
	2	Sea on sight: spatial planning, institutional frameworks and ecosystem management	Martin Pastoors/ Luc van Hoof	Imares

11.1	Competing claims on natural resources and governance
Part 1	Henk Zingstra
1.Abstract	In the Lake Burullus there is environmental degradation and over-exploitation of resources. The DPSIR framework is a generally available instrument, originally developed to describe environmental impacts. It is frequently used for direct analysis of situation of competing claims. Sometimes the analysis is used as base for scenario development.
2.Instrument	The instrument is about: • Drivers (socio-economic, biophysical) that lead to change in the ecosystem under study • Pressures are the means by which ecosystems services are exploited and through which the needs and demands from the drivers are satisfied, e.g. irrigation, aquaculture etc. • State change of the ecosystem services and their quality • Impacts are the changes in socio-economic and environmental conditions that result from the changes in the state of the ecosystem services. • Responses are the actions in response to drivers, pressures, state changes and impacts. These may be technical and institutional and involve policies and planning
3. Category NE-DEED	Describe qualitatively and explain analytically
4.Multi-disciplinarity	It takes into account biophysical, socio-economic and institutional aspects
5.Transition	Biodiversity, ecosystem services
6.Stakeholder orientation	It is not stakeholder oriented, although the Response part is induced by stakeholders.
7.Role in negotiation process	The output can be a starting point for discussions among stakeholders, but it is not sufficient.
8. Multi-level character?	It is ecosystem focused, in this case at the local level, but it takes into account other levels where pressures and responses come from.
9.Role of scientists	Description and analysis of the situation.
10.What are the data inputs?	Qualitative information obtained from stakeholders
11.What are the outputs?	An analytical description of drivers, pressures, state change of ecosystem services, impacts and (policy) responses.
12.Which trade-offs?	Ecosystem services of Biodiversity versus (1) agricultural production, (2) fisheries (3) other land uses. Long term sustainability versus short term productivity
13. Possible co-operation within KB	If properly used, this tool can surely give valuable insights as a starting point.
14. Website	www.competingclaims.wur.nl/UK/

Part 2	Arend Jan van Bodegom & Seerp Wigboldus (CDI)
1.Abstract	This project also entails a component on Forest Governance Monitoring, developed together with FAO and Tropenbos Int. The idea is to bring into 'conventional', more technically and silviculturally oriented forest monitoring , new aspects regarding forest governance. The motivation is that through better monitoring forest governance could be improved, which could lead to better regulations and institutions for dealing with the different claims on forests and forest soils.
2.Instrument	Development of criteria and indicators to be monitored, including the use of existing data, but presented in an aggregate and more transparent way.
3. Category NE-DEED	Description
4.Multidisciplinarity	Governance, participatory monitoring, forest monitoring
5.Transition	Biodiversity
6.Stakeholder orientation	Stakeholders should define which aspects are most important to be monitored

7.Role in negotiation process	Monitoring can inform stakeholders about progress on governance issues that are important for them
8. Multi-level character?	Yes: local, provincial, national
9.Role of scientists	Facilitator, designer of process to develop the system
10.What are the data inputs?	Qualitative and quantitative data on governance aspects
11.What are the outputs?	An overview of governance aspects. Monitoring output can be an input to formulate policies to adapt to governance aspects that are not going well.
12.Which trade-offs?	Land use for forests versus land use for other use; sustainable and legal use versus unsustainable use
13. Possible co-operation within KB	Other components of this project are focusing on cooperation, but on the topic of Forest Governance Monitoring there is no cooperation with other KB projects
14. Website	www.competingclaims.wur.nl/UK/

Part 3	Arend Jan van Bodegom, Nico Rozemeijer
1.Abstract	• For the CDI course Competing Claims a *website* on Competing Claims has been developed which is updated regularly. This effort is financed through the KB11 project Competing Claims on and governance of natural resources. • Courses are not part of the KB programme, but are an intervention strategy.
2.Instrument	• Both the course and the website try to give a general picture of theories and intervention strategies regarding Competing Claims. • See website http://www.competingclaims.wur.nl/UK/
3.Com Cl Category (DEED)	Design
4.Multi-disciplinarity	For capacity building resource persons from various disciplines can be used.
5.Transition	
6.Stakeholder orientation	Improve knowledge and capacities of stakeholders
7.Role in negotiation process	Capacity building can lead to better and understanding and more informed participation of stakeholders in negotiations.
8. Multi-level character?	Yes
9.Role of scientists	Facilitator
10.What are the data inputs?	All types of information regarding general theories on Competing Claims, and possible instruments.
11.What are the outputs?	An overview of theories and instruments and projects
12.Which trade-offs?	In principle an overview of all instruments and approaches to be used when dealing with the different trade-offs.
13. Possible co-operation within KB	Yes, for example making the overview of CC-related projects within WUR
14.On CC Website?	www.competingclaims.wur.nl/UK/

11.2	**Enhancing sustainable development in the palm oil sector** – Marianne van Dorp (CDI)
1.Abstract	Exploring ways to enhance the sustainable development of palm oil in Thailand and Indonesia through PhD research ad through combined action research. One of the stakeholders/governance bodies for attaining sustainanable palm oil is the Round table for sustainable palm oil (RSPO) • with stakeholder meetings. • action research in combination with PhD research. CDI involvement is is additional to PhD work. Principles of action research: (1) reflection, (2) with the roots in reality, (3) empowerment and (4) emancipation • Reflections with stakeholders: social and environmental aspects from the local perspective. Role of palm oil production in rural livelihoods. Models and scenarios forenhancing sustainable production of palm oil:: how can such models, that will be developed and validated in cooperation with stakeholders be used to influence policies? (Indonesia and Thailand)
2.Instrument	• Models and scenarios for sustainable development of palm oil will be developed, from an environmental point of view, from social and economic and from governance point of view. Important goal of the research will be the validation of the different models, scenarios and pathways for sustainable development with the various stakeholders. Translation of the models towards the needs of the end users is na essential part of the research. • Conceptual frameworks to be used for this work include: o Complex adaptive systems approach o Networks and flows: material and immaterial flows, and the role of programmers and switches
3. Category NE-DEED	8 PhD candidates, 4 in Indonesia 4 in Thailand. In each country they range from the level of primary production (closing the yield gap) to governance at local/regional level (land issues) and national (environmental) policies. The 'top two' PhD candidates deal with governance issues, of which one deals with global governance and the role of RSPO.
4.Multi-disciplinarity	Inter-disciplinarity is very important: how to really co-operate?
5.Transition	Sustainable development (environmental, social and economic)
6.Stakeholder orientation	Policy makers at different levels, local communities, implementers of local policies. Stakeholders include local small-scale producers, the processing industry, including multinationals, NGOs, RSPO.
7.Role in negotiation process	Round table is a negotiation process
8. Multi-level character?	• Different levels; production by small-holders, environmental policy, governance structures at national and international level, global structure: RSPO • Objective is better inclusion of small-holders in chains developed by agro-industry. • Governance structures at different levels and their interactions: traditional right versus local, national and sub-national official rights.
9.Role of scientists	Role of the people who work on their PhD is more descriptive, and slightly more disciplinary oriented. Role of CDI is to bring stakeholders together and to translate and interpret results with the stakeholders: facilitation of dialogue, and safeguard inter-disciplinarity by facilitating the dialogue among PhD candidates.
10. Possible co-operation within KB	• Specifically for including action research instruments, and better 'ground' work of the PhD candidates into 'reality' • Stimulating and facilitating inter-disciplinarity through enhancing learning between the PhD candidates • Facilitate stakeholder dialogues
10.What are the data inputs?	• Difficult to say in this stage; the project has just been agreed for financing (Sept 30) and yet has to start up.
11.What are the outputs?	- The project aims to deliver 'sustainable pathways'; ways forward to further develop the palm oil sector in such a way that (sustainable) inclusion of smallholder producers is safeguarded. Economic and social aspects play a role, but also importantly environmental issues, both from the point of view of land use and the use of other productive resources as from the point of view of environmental pollution (processing plants) and greenhouse emission gases (peat soils).
12.Which trade-offs?	Land, water and other productive resources, labour. The programme deals with the use of productive resources that are used to produce palm oil at the expense of

	other livelihood options for smallholder farmers. Especially in the areas where communities are new to the field of palm oil, much uncertainty exists on the potential benefits of the palm oil sector, especially in comparison to existing livelihood options. Indonesia: environmental trade offs in planting palm oil compared to forest areas (habitats); This is less an issue in Thailand where palm oil is mainly planted in ex-rubber plantations
13. Possible co-operation within KB	• Cooperation exists with SSG, University part: Arthur Mol, Peter Oosterveer, Katrien Termeer, Otto Hospes; Carolien Kroese (ESG), and Ken Giller and Maja Slingerland (PSG) •
14. On CC Website?	Yes

11.3	**Global Spatial Framework for Agricultural Productivity and Resource Use Efficiency** Sjaak Conijn (PSG)
1.Abstract	The project develops maps of agricultural resource distribution, based on data with global coverage (soils, weather, land use, harvested crop area, fertiliser use, etc.) and models for crop production and related water balance as function of the available resources. This instrument not only describes current situations but also offers quantitative fundaments for improvements and development options, such as: where can you realise a production increase; what is needed to produce two times more; how much nitrogen and phosphorus is required; effects of weather variability on yields and possibility for implementing insurances for crop failure; where can inputs most efficiently be used for increasing crop yields?
2.Instrument	This project aims specifically at offering knowledge to improve current agricultural systems in a spatial explicit way based on agro-ecological insights and seeks to give quantitative fundaments for development options. It answers questions like • where can you realise an increase in production? • what is needed to produce two times more (e.g. how much nitrogen and phosphorus) • effects of weather variability on yields and possibilities for adaptation • where can inputs most efficiently be used for increasing crop yields
3. Category NE-DEED	Descriptive, analysing and exploring: results, as in maps, can show different possibilities and options but do not prescribe what must be done.
4.Multi-disciplinarity	Oriented at agricultural production
5.Transition	Sustainable agriculture and food security
6.Stakeholder orientation	No (possibly development banks, fertiliser companies, etc.)
7.Role in negotiation process	Initial focus: Dutch international policy makers; results could play a role as input for the Min of EL&I in defining international policies ('international resource use planning')
8. Multi-level character?	• Mostly global, continental or national level. It is not for the local or farm level. • It could play a role in answering questions in issues like 'land grabbing' , indirect land use change and so on. • The size of a grid cell of the used global soil map is at the equator ca. 8000 ha, near the poles (much) smaller, in Europe ca. 6000 ha. • In principle the framework can be used at higher levels of resolution (i.e. smaller grid cells), but global information is not readily available. Alternative is to use regional specific maps of higher resolution.
9.Role of scientists	Provider of options to policy makers.
10.What are the data inputs?	Spatial data on soils, weather, land use, crops and agricultural inputs, all geo-referenced and quantitative.
11.What are the outputs?	Ultimately: options to improve agricultural production in a spatial explicit way. Intermediate products are maps illustrating resources distribution, scarcity and requirements related to crop production possibilities New aspects to be introduced include variability in climate and carbon fixation.
12.Which trade-offs?	Land use for agriculture versus other uses; water use for agriculture; use of fertilizer and related GHG emission; carbon fixation versus agricultural production (or carbon fixation in agricultural production)
13. Possible co-operation within KB	• Tool is applied in BO-projects and can be useful to other KB projects • Cooperation with LEI (Gerdien Meijerink) to link biophysical aspects with socio-economic aspects (both spatially explicit).
14. On CC Website?	Yes

11.4	**JOLISAA -** Jolanda van den Berg (LEI)
1.Abstract	This project aims to increase understanding of agricultural innovation systems focusing on smallholders' livelihoods and the articulation of local/traditional and global knowledge. Specifically, JOLISAA's goal is to assess how smallholders' innovativeness, knowledge, capacities and other resources can be tapped into, strengthened and linked effectively to those of other stakeholders – public or private, local or global – to contribute to reducing rural poverty and improving food security in Africa. To this end, lessons learnt about past and ongoing experiences with agricultural/rural innovation involving multiple stakeholders in Eastern, Southern and West Africa will be synthesised by combining joint case-study assessment with capacity-strengthening and networking at various scales.
2.Instrument	• Livelihood analysis approach (the five DFID aspects) • Surveys in order to focus on a specific question; action research • New institutional economics to describe and explain • Participatory action research to explain network relations, power differences, conflicts, cooperation, traditional rights versus official rights • MCA • Challenge is to link different types of knowledge from different stakeholders. • Integrated qualitative and quantitative impact assessment • Discourse analysis: policy narratives versus local views. A certain discourse may lead to the exclusion of a certain group to a certain resource (competing claim). • Boundary object: a tool to discuss a certain issue across the borders of the different stakeholders.
3. Category NE-DEED	All categories
4.Multi-disciplinarity	Social sciences
5.Transition	Agriculture and Food security
6.Stakeholder orientation	Relevant stakeholders at local level
7.Role in negotiation process	Different instruments deal with local negotiation processes
8. Multi-level character?	Most of all focussing on the local level and the landscape level.
9.Role of scientists	Knowledge in action, looking for societal impact. Role is not so much steered out of theory
10.What are the data inputs?	Local perspectives and knowledge from stakeholders;
11.What are the outputs?	Locally supported proposals for increased food security; also proposals for local institutional change
12.Which trade-offs?	Local interests versus national policies; traditional rights versus official rights;
13. Possible co-operation within KB	• Methods are most of all qualitative. It could be useful to combine this method with more quantitative information: measuring is knowing. • Obvious links with MSP and social learning • It is about facilitation of social and institutional change - transition
14. On CC Website?	?

11.5	**Scenarios and models for food security** Hans van Meijl, Geert Woltjer, Thom Achterbosch (LEI)
1.Abstract	The project develops models for the analysis of different CC issues: land use transitions, green growth and food security. VOLANTE (Visions of Land Use Transitions in Europe): brings together researchers with experience and expertise on land use change at various spatial and temporal scales enabling a focus on vision development. It aims to provide an integrated conceptual and operational platform for land management in Europe. It is designed in three modules: Processes, Assessment and Visions. www.volante-project.eu The Volante consortium benefits from existing cooperation in two international networks active in the area of land resource management and land use change. FOODSECURE (Exploring the Future of Global Food and Nutrition Security): The FoodSecure collaboration responds to the challenge of food shortages and volatility by providing stakeholders, in the EU and beyond, with the capacity to assess and address the short term and long term challenges of food and nutrition security both effectively and sustainably. The project draws on an expert, multi-disciplinary, science team to provide a complete set of knowledge to inform and guide decision makers and other stakeholders in formulating strategies to alleviate food shortages.
2.Instrument	Models for exploring land use, production and food security. Biodiversity, land needed for agriculture etc. It is based on earlier work in Global Trade Analysis Project (GTAP) and MAGNET. Database contains 118 regions in Europe. Only a limited number of developing countries will have sufficient data to run this model. Driving forces of demand and supply, GNP growth, food necessities for the future, what will be the consequences for land use? Consequences include: extension of areas for agriculture, production growth, more intensive production, improved efficiency, decrease of wasting in food production and handling etc.
3.Category NE-DEED	Analysis and Exploration: trade-offs, scenarios.
4.Multi-disciplinarity	• Economy, ecology, forestry, forest management, fisheries, Green House Gases. Volante focuses on forestry and stakeholders. • Difficult to bring in the behaviour of stakeholders; not everybody acts according to the economic market rules (market imperfections, see 6) ; however, power relations and behaviour of stakeholders can be integrated in a model in quantified terms.
5.Transition	Food security
6.Stakeholder orientation	• Not everything can be grasped by putting it into a modelling framework. For the analysis different stakeholders have to be involved. • Cooperation with stakeholders and differentiation between stakeholders are still bottle-necks • Communication with EU policy makers
7.Role in negotiation process	Decision Support System
8. Multi-level character?	The program works at national and international level with different scenarios to get more insights into various policy options. The strength of the model is to include the whole world economy. Its weakness is that that it is at a fairly undetailed level. It is consistent, relations between regions are taken into account.
9.Role of scientists	• Volante has a process approach. The scenarios are a communication tool. • A main area to improve the toolbox is for the assessment of food and nutrition security at household level. It is important to acknowledge that households are heterogeneous (for example in location and endowments).
10.What are the data inputs?	
11.What are the outputs?	
12.Which trade-offs?	Land use for biodiversity versus agriculture (food and nutrition security);
13. Possible co-operation within KB	• In principle there could also be a relation between these macro-models and the criteria for sustainability. The macro-models provide information on large-scale impacts, then you can adapt the criteria for sustainability. • Outcomes of model calculations can be used as input for CBA. • Think together with others how to better involve stakeholders and make results of the models better applicable for policy and practice.
14.On CC Website?	For VOLANTE Bas Pedroli should be contacted. There is a volante website: www.volante-project.eu

11.6	**More food on smaller foot** – Herco Jansen (ESG)
1.Abstract	Sustainable food and natural resource management: increase food security with a smaller ecological food print. It is about scenarios for food production in Sub-Sahara Africa. It focuses on water sheds, the Limpopo basin. Limpopo (Mozambique) is pilot.
2.Instrument	• Thresholds for groundwater level while using ground water. Using groundwater may be useful on a small scale, on a larger scale it is not sustainable. • Biophysical aspects like soil erosion, water pollution are part of it, like crop growth • It is still in an early development phase.
3. Category NE-DEED	Describe, explain (understand), explore (scenarios and opportunities)
4.Multi-disciplinarity	Environmental sciences
5.Transition	Food security and Environment
6.Stakeholder orientation	• Stakeholder analysis, community plans and discussions with stakeholders are part of the approach to be developed. Institutional barriers will be taken into account. • Consequences of different options for different stakeholders are calculated.
7.Role in negotiation process	Is used for planning and negotiation, but not starting from conflict, contradictions.
8. Multi-level character?	• It tries to link different levels, land use planning, use of ground water • Most of all to be used at local and regional scale and then link it to global level. • Local level and then up scaling till watershed level. Relations upstream and downstream are made, even if distances are big.
9.Role of scientists	With results of the model calculations, the scientist feeds discussions among stakeholders
10.What are the data inputs?	• It is in principle a tool for data scarce environments.
11.What are the outputs?	
12.Which trade-offs?	Land use for biodiversity versus agriculture ; water use for biodiversity or agriculture; optimisation of use of water in a watershed
13. Possible co-operation within KB	• Crop growth is part of it and cooperation with Sjaak Conijn is envisaged. • Economic factors are not yet in, so cooperation would be possible there. • With Madeleine van Mansveldt cooperation will be sought on ecological food print.
14. On CC Website ?	Herco is interested in the CC website and will provide a short description.

11.7	**Agriculture-Nutrition linkages** Marianne van Dorp (CDI)
1.Abstract	The project aims to develop a model for a nutrition-sensitive agricultural interventions, among others value chain development. The project explores the potential steps for intervention. How that has to be developed is still under study and debate. Food security aspects include: availability, access, use (balanced food: nutrition). Agriculture-nutrition linkages are currently on the international agenda, e.g. USAID, DFiD, IFPRI, GIZ.
2.Instrument	The tool is not yet clear, as the work is in exploratory phases. Questions include: • How would it be possible to promote a more nutrition-sensitive growth of agricultural production? • How to facilitate discussions between nutritionists and professionals involved in stimulating agricultural growth ? • Can value chain development be combined with simultaneous food security/nutrition improvement objectives in the production area? If yes, how can value chain development be adapted in order to achieve these objectives? Examples include to inclusive value chain development with an eye on food security and nutrition trade-offs for all actors in the value chain including consumers, explicitly taking consumers and their nutritional needs as a point of departure for value chain development, and when taking non-food value chains as intervention options, make sure that additional incomes can indeed be translated into additional healthy food by simultaneously developing local food value chains. • What types of additional policies are necessary in order to orient value chain development towards the needs of vulnerable groups from a nutrition point of view?
3.Com Cl Category (DEED)	Design
4.Multi-disciplinarity	Development of agriculture, economic development and better nutrition
5.Transition	Sustainable agriculture; food security
6.Stakeholder orientation	The aim is to better involve the interests of vulnerable groups in development of agriculture and value chains in relation to other actors in the value chain
7.Role in negotiation process	The approach fits with an increasing international awareness that agricultural development and improving food security and nutrition should go hand in hand when attempting to decrease hunger and malnutrition. Negotiations should take place with national and lower level policy makers and academia assuming that increasing (agricultural) productivity and economic growth will 'automatically' solve issues of hunger and malnutrition.
8. Multi-level character?	Local level and value chains (which go across all levels?), at least in the design, pilot phase.
9.Role of scientists	Together with stakeholders design a model for intervention
10.What are the data inputs?	Data inputs are firstly a scoping study on what is known and what are the knowledge gaps in terms of nutrition sensitive agricultural development. The second stage in data inputs are the data collected in field work on the potential additional interventions needed in order to make agricultural development, including value chain development nutrition sensitive.
11.What are the outputs?	Output is a model for inclusive agricultural and value chain development, taking into due consideration the needs of vulnerable groups in terms of food security and nutrition.
12.Which trade-offs?	Agricultural production for the market combined with production for a balanced nutrition for consumers and for actors along the value chain.
13. Possible co-operation within KB	The research question is challenging, and seen as such by an international audience of policy makers, (multi-lateral) donors (USAID, GATES Foundation, DFID, etc.) and academia alike (IFPRI, IDS, WUR, etc)
14. On CC Website?	?

12.1	**Monitoring and Evaluation of Sustainability** Koen Boone (LEI)
1.Abstract	This project is focused on measuring aspects of sustainability important for the private sector. It will be used for the 'Sustainability Consortium', with 80 companies, among which is Wallmart. Until now a majority of companies that participate each for 100,000 US$ is American. The aim is to involve also companies from Europe and Asia. Now most of all American universities are involved, but WUR will become official partner and coordinator for Europe. There are some 30 different initiatives undertaking comparable efforts but this one is by far the most promising. Also NGOs are involved, like WWF, WRI. Ahold, Unilever and Marc & Spencer are also interested.
2.Instrument	• Life Cycle Analysis (LCA) of product chain; the result is the sum of scores on many environmental themes. In cooperation with RIVM 'Recipe' methodology is applied. • What is the procedure? Definition of the 'product; data collection on the various steps in the production (and value) chain; collection of the environmental parameters; translation to a total score. • The balancing of the different parameters (which one is more important than another one?) is not in the system.
3. Category NE-DEED	Description
4.Multi-disciplinarity	It takes into account various aspects of PPP
5.Transition	Sustainable agriculture, energy, environment
6.Stakeholder orientation	Most of all private sector
7.Role in negotiation process	The result of the 'sustainability scan' is used at the level of the company and inside the company for discussions on the need to perform better on certain aspects etc.; it creates a certain level of transparency. Is scan geen sustainability consortium
8. Multi-level character?	• It deals with the different steps in the value chain • It deals with the score of companies, but in principle it could also be used to rank countries. • No experience in developing countries.
9.Role of scientists	Developing the system and bringing the results to the company.
10.What are the data inputs?	Life Cycle Inventory data
11.What are the outputs?	• Research reports around mersuring of sustainability (water quality, biodiversity, social indicators etc.) • Methodology to measure sustainability of products • Data about sustainability of products • Options for improvement • This all in an easily accessible tool
12.Which trade-offs?	Use of all relevant resources for the production of a certain product.
13. Possible co-operation within KB	Possibly with Don Jansen, who works on coffee with DE (Sara Lee), but at the farm level.
14. On CC Website?	?

12.2	**Development of instruments for estimation of sustainability of agricultural value chains** Don Jansen (PSG)
1.Abstract	Balancing pros and cons of sustainability of production of commodities
2.Instrument	a. Total factor productivity approach b. All factors are expressed in monetary terms. If that is not possible it can formulated as part of a condition. c. Result is a score which allows you to have an integral, single indication of sustainability that can be used to compare similar products (e.g. coffee, biofuel) that are produced under different situations/crop management d. Cases include coffee. Could also work for e.g. biomass, however with biomass other criteria are important.
3. Category NE-DEED	Exploration: giving insight in the effects of options
4.Multi-disciplinarity	Yes, because expertise of a variety of disciplines is needed to value the different aspects of sustainability
5.Transition	Sustainable agriculture
6.Stakeholder orientation	Focussing on the private sector and farmers level
7.Role in negotiation process	Not applicable
8. Multi-level character?	All steps in value chains are to be involved
9.Role of scientists	Developing the system
10.What are the data inputs?	Use of inputs (types, amounts, prices) and resulting outputs (products and other wanted or unwanted outputs, types, amounts, prices) in production, transport and processing; indicator values of effects on variety of issues (e.g. CO2 emission, biodiversity, human capital) of inputs and outputs, possibly calculated through LCA or models; cost of these effects
11.What are the outputs?	A score which you can compare between different ways to produce a similar product in terms of the total factor productivity where all income (either from products or positive effects on issues) divided by all costs (either direct or indirect)
12.Which trade-offs?	Integral assessment of sustainability of agricultural products where trade-offs are all implicitly calculated in monetary terms. Trade-offs are then not compared one on one (as is the case in spider diagram of LCA results), nor weighted according to subjective stakeholder evaluation/weighing procedures, but on a more objective set of costs per effect that allows a comparison of all effects in one number.
13. Possible co-operation within KB	It could be useful to cooperate with researchers of (environmental) economics and ethics
14. On CC Website?	Yes

12.3	**Knowledge framework for sustainable land use** Kees van Diepen (Alterra)
1.Abstract	Policy analysis in a region on reorganisation of livestock farming. Various reorganisation options will be modelled and compared. Question for research include: what will be the effect of increased size of livestock farms on • emissions and locations of the farms • space, income, social acceptation by other citizens • effects on other sectors: impact indicators and foot prints. This part still has to be developed.
2.Instrument	• Two groups of models are used: (1) simulating the farming system (FSSIM, APES) and (2) modelling water quantity and quality (STONE, Waterwise) (See annex 2). Scenarios are compared based on water quality, pressure by nutrients, farm income, employment, etc. • Addresses discussions related to so-called mega stables • Pilot area between Den Bosch, Bergeijk, Roermond and Maas, with specific case studies in Egchelse heide and Wanssum • Takes into consideration different sizes of the farms
3. Category NE-DEED	Description, Explanation and Exploration, with a link to Design
4.Multi-disciplinarity	• Analysis is still partial and not across all sectors. It is an Alterra project • Institutional aspects are not yet dealt with • Economic aspects via Madeleine van Mansveld and Peter Smeets
5.Transition	Sustainable agriculture, focussing on Planet and Profit pillars of sustainability.
6.Stakeholder orientation	Province and the private sector
7.Role in negotiation process	Stakeholders themselves have to estimate the consequences of different scenarios, but the project can provide information for the political negotiation process. Stakeholders from Egchelse heide and Wanssum are asked for input
8. Multi-level character?	• Focuses on the provincial level, until now a Dutch oriented project. From the farm level to the region; the higher levels are 'background'. • Approach could also be used in Eastern Europe and India, but other types of data are available (less detail).
9.Role of scientists	• Provide data, but no organisation of the debate. • The distance between scientist and user has not been bridged yet.
10.What are the data inputs?	Data on weather, cropping and livestock (e.g. Giab), soils, hydrological situation, parcels (BRP: location and use), farm economy (FADN)
11.What are the outputs?	Predictions for 2020 on yields, yield gaps, acreages, numbers of animals, N balance, water quantity and quality, farm income, employment, etc. Based on these outputs, different reorganisation options will be compared and ranked on basis of sustainability.
12.Which trade-offs?	
13. Possible co-operation within KB	• Problem: Software is not adapted to be used with other models.
14. On CC Website?	Yes

13.1	**Cross-sectoral risk economic comparison of bio-based initiatives** Douwe Frits Broens (LEI)
1.Abstract	Objective of the project is to develop a model for biogas production. There are at least 20 ways to produce it, but at this moment they are not yet economically viable. There are variables like prices of different raw materials, risks and regulations that need to be taken into account.
2.Instrument	Biogas is a national game. It is mostly dependent on subsidies, only few claim they can do without. • Biogas comes from many different feedstocks. Manure, sewage slurry, organic residuals. For the latter, biogas production competes with animal feed, biofuel or compost production. In NL there is a so-called white list of residuals that – through biogas production – may end up on agricultural land, but it is a rather limiting list, while in other EU countries there is no list at all. Whatever way of production, you end up with a "digestate" residu which contains nutrients like phosphate, for which regulations are applicable. The theme is also relevant for developing countries: also there biomass can compete with fodder for animals, but this model is at the moment for the Dutch situation. The model integrates the production of feedstock materials (e.g. cattle farm producing manure), the biogas production itself, and the application of the gas, for instance in co-generators or liquid form as a transport fuel. Feedbacks are possible in the reuse of heat or nutrients.
3. Category NE-DEED	describe and explore
4.Multi-disciplinarity	It is about different value chains and technologies
5.Transition	Sustainable energy
6.Stakeholder orientation	• Cooperation with Knowledge Centre for Green Gas Nederland. The private sector is also involved Essent (electricity) and different technology providers. Case base is extended through cooperation in een international Interreg project. • Government is also present.
7.Role in negotiation process	In the end the model makes clear which routes towards biogas production and – consumption are economically viable, incl. conclusions on different competitive feedstocks.
8. Multi-level character?	It is focusing on on complete value chains: feedstock production, biogas production, biogas consumption/application
9.Role of scientists	Structuring of the problems, looking at gaps, participate in the debate.
10.What are the data inputs?	Business economic data (balance sheets) of all three supply chain steps, volumes of different feedstocks, biogas yields, prices. What-if analyses are possible.
11.What are the outputs?	Business economic characterisation (profit/loss statement, net present value, risks) for any supply chain.
12.Which trade-offs?	In the bio-based economy there is a virtual triangle: • At the top there are high value applications of bio-based raw materials in the chemical sector and for plastics. But there is not so much material needed. • In the middle, with more availability but less value are the fuels for transport: bio-ethanol and bio-diesel. Supported by the EU measure to mix biofuels with traditional fuels. • At the base of the triangle is the low-value application with large applicability of raw materials. It is about production of warmth and energy and biogas. These different uses of biomass do compete with each other. 1 and 2 for commodities, 2 and 3 for residuals.
13. Possible co-operation within KB	• There are surely linkages between bio-based and food security: competition for the same resources, but also utilisation of resources (food industry residuals and manure). So the food industry would have an interest in cooperation. • There is a geo-political aspect on bio-based. There is also a clear power aspect. • There is also a moral aspect: when does the search for biomass becomes grabbing or land grabbing? And when is it acceptable, because we have to take care of our vital interests?
14. On CC Website?	Yes

13.2	**Biomass Futures –** Berien Elbersen (Alterra)
1.Abstract	The Biomass Futures Project will assess the role that biomass can play in meeting EU energy policy targets. It will develop tailored information packages for stakeholders, as well as inform and support policy makers at both the European and national levels. Estimation of potentials of all biomass types in agriculture, forestry, debris, their spatial dispersion, taking into account criteria for sustainability. Scenarios play a role in biomass energy and renewable energy targets for 2020 and steps between now and 2020. It is an EU project with many partners and KB funds as co-financing.
2.Instrument	Production of biomass costs emissions of greenhouse gases. With the MITERRA model per crop and situation the emission can be calculated. Also during conversion and transport of the biomass emissions are produced, depending on the region. As a result the net mitigation value can be calculated (in greenhouse gas emissions). • Other models used in this EU project: GLOBIOM, RESOLVE, PRIMES and CAPRI (see annex 2). • Relation with competing claims is: energy or biomass crops result also in a shift of production of crops to other regions: the Indirect Land Use Change (ILUC). This is an important factor and the EU has not yet decided how to deal with it. If it is taken into account, much biomass production (for fuel) in Europe will be inefficient as to mitigation. The EU may also sharpen the criteria for biomass production: no tropical rainforest cut, not on marshland etc. Certification will be needed under a private or national scheme. EU member states have to develop a control mechanism. Until now only Germany and Austria have it.
3.Category NE-DEED	Explore. Also describe and explain for the stakeholders.
4.Multi-disciplinarity	Experts in energy production systems, economists, environmental experts, communication experts.
5.Transition	sustainable energy. However, the bio-based economy component is lacking, according to that approach raw materials firstly have to be used for high value applications (e.g. plastics) and only the debris should be used for generation of energy. Question remains if it leads to substantial reduction in emissions (mitigation). It could also lead to shift of production to areas outside the EU.
6.Stakeholder orientation	• During stakeholder meetings private sector, EU staff, European Energy Association, energy companies and others are informed about results of scenarios. • Stakeholder communication and participation is part of the EU project and a task of the Institute for European Environmental policy (IEEP).
7.Role in negotiation process	The outcome of the models is used to see whether National Renewable Energy Action Plans (NRAPs) are realistic in reaching the 2020 targets set out by the Renewable Energy Directive (RED) from the EU.
8. Multi-level character?	It is for the national EU member state level, with links to the global level. Data input is from regional level to global, disaggregate or aggregate them to the national level.
9.Role of scientists	Scientists have to report very frequently to EU policy makers and stakeholders during stakeholder meetings.
10.What are the data inputs?	
11.What are the outputs?	
12.Which trade-offs?	Biomass production forestry and in agriculture versus the use of agriculture and forests for production of other goods and services (e.g. biomass crops or other crops)
13. Possible co-operation within KB	• Work in EU project with among others the Imperial College. • They cooperate with PBL (Hans Erens) • Project of Douwe Frits Broens (LEI) is more at national and company level. • Competing Claims in terms of Agriculture and Energy is a relatively weak point in WUR.
14. On CC Website	Yes. It would be useful to mention the link of the EU website of this project http://www.biomassfutures.eu/

13.3	**Low toxic accession of *Jatropha curcas*** Raymond Jongschaap (PSG)
1.Abstract	Evaluation of a low toxic accession of *Jatropha curcas* in fence and monoculture production system for benefit of local producers and those who need biomass for fuel production. Jatropha only grows in tropical environments and can be used as a fence and at the same time produce biomass and oilseed for energy production. Most accessions are toxic, and only the oil from the seeds can be used as fuel. Mexican accessions from the Veracruz area are low in toxic phorbol esters. So they can be used for local energy production while the press-cake (after treatment) and evaluation may be used as protein source in feed. Plant breeding may introduce low-toxicity in other *J. curcas* accessions. If the Jatropha could be integrated in traditional farming systems, the biofuel could also be used to produce electricity for villages: social function.
2.Instrument	• There are field trials with low toxix accessions in Belize, Brazil, Cameroon, India, Indonesia, Mali, Madagascar. In Belize agronomic factors are included for optimisation of the productivity: tree density, fertilisation and pruning. • Questions include: o Does the Veracruz jatropha accession grow and produce similarly as toxic accessions? o Is the press-cake easily integrated in local farming systems as feed? o It is in fact about searching for the food-feed-fuel relation.
3. Category NE-DEED	Design an innovation which diminishes the competition between food, feed and fuel
4.Multi-disciplinarity	Physical, social-economic has to be combined, but always the specific local situation has to be taken into account
5.Transition	Energy, sustainable agriculture
6.Stakeholder orientation	• NGOs and Universities doing the research • Plant produce growers/dealers • Farmers
7.Role in negotiation process	only at the farm level, to convince the farmer. at local and national policy level, to provide options for the agricultural sector and options in the energy debate and the role of biofuels
8. Multi-level character?	International and national biofuel demand and local needs
9.Role of scientists	Verify results of trials, bring in the innovation, the advanced breeding system. Negotiation to convince local and national policy makers and the farmers that they should look at jatropha as a viable option in food-feed-fuel debate
10.What are the data inputs?	Knowledge on different jatropha accessions, knowledge on field experiment execution, knowledge on local production systems , knowledge on jatropha agronomy options, knowledge on local farming systems
11.What are the outputs?	A low toxic jatropha accession adapted to the local situation which can be integrated in local production systems
12.Which trade-offs?	Production of biomass for energy versus the use as fodder. The low toxic accession may combine these uses. The dedication of land to produce biofuels that may enhance agricultural output and profit at upstream and downstream activities in the chain.
13. Possible co-operation within KB	• Already in cooperation with Wageningen University (PPS: Ken Giller, Maja Slingerland and with Plant Breeding: Richard Visser, Robert van Loo): Sandwich PhD in Indonesia and sandwich PhD in Guatemala
14. On CC Website	Yes.

14.1	**Methods for supporting sustainable area development** Stijn Reinhard (LEI)
1.Abstract	This project focuses on adaptive management of land use and the resilience of rural areas in The Netherlands. Through simulation it shows how agents react on changes in policies or spatial changes and the significance for natural elements.
2.Instrument	• Shift-share analysis (see Annex 2): a. Economic growth per sector, looking backward and forward b. Translation of global trends to areas, based on relatively simple data c. Four small projects together in this KB project, all based in The Netherlands. 4 project managers who apply a comparable approach. They meet every 6 weeks. For every sub-project there is a client within the Dutch DLG • PPP of companies combined with sustainable area development: Not only for agricultural businesses but also for other types of business, like recreation, restaurants etc. • Comparison of different regions as to their sustainable development. For example: Zeeuws-Vlaanderen could score 7 and Schouwen-Duiveland 6. • SPARD, EU project Monitoring of policy goals. Impact analysis. For example: a. the policy goal is to improve the labour productivity. The instrument: capacity building, training. So the aim is to bridge the gap between output and impact b. Input: regional development plan of the EU members. Impacts on labour productivity, environment and nature, diversification of the economy *(e.g. tourism).
3. Category NE-DEED	Describe and explore
4.Multi-disciplinarity	
5.Transition	Land use
6.Stakeholder orientation	Stakeholders are companies, the government (regional policy makers).
7.Role in negotiation process	
8. Multi-level character?	From higher levels towards the lower levels, but not internationally oriented.
9.Role of scientists	Inform the process; the scientist is involved in the problems
10.What are the data inputs?	SPARD: regional development plan of the EU members. Impacts on labour productivity, environment and nature, diversification of the economy *(e.g. tourism).
11.What are the outputs?	
12.Which trade-offs?	Spatial planning policies and their consequences for sustainability
13. Possible co-operation within KB	
14. On CC Website?	

14.2	**CO-EXIST** Arie van Duijn (LEI)
1.Abstract	CO-EXIST is for spatial management of European coastal zones, in order to stimulate fisheries and aquaculture. Questions to be answered include: • Fish stock spatial dispersion: is it useful to protect certain areas? • What are the resulting conflicts for fisheries/aquaculture and the economy? • Where to plan fisheries, aquaculture, nature?
2.Instrument	• Baseline: inventory of conflicting uses, technical possibilities, combinations, also in the future. • Governance: rules, laws, policies, institutional framework, stakeholder mapping. How can we best design the process for planning? • Models and data: objectives, indicators. • Multi-Criteria Analysis in order to weigh the impact scores. • Evaluation of the various scenarios for spatial management. Weighing of effectiveness, ratio costs/effectiveness. By stakeholders • Synthesis of the cases.
3.Category NE-DEED	• Describe, Explain, Explore and Design
4.Multi-disciplinarity	• Fisheries, aquaculture, economics, ecology, (micro-)biology, epidemiology
5.Transition	• Sustainable food security
6.Stakeholder orientation	• Stakeholders weight the different policy objectives (MCA- Multi Criteria Analysis)).
7.Role in negotiation process	• At least one element, the MCA, is with different stakeholders.
8. Multi-level character?	• Concentrated on coastal zones and coastal seas. From local government level up to EU level and beyond (e.g. IMO, UNCLOS).
9.Role of scientists	• Research but also facilitation of the stakeholder process
10.What are the data inputs?	• Economic Data: economic data as defined and gathered for the DCF • Biological data: ICES data: catches and stocks (SSB) of target species • Logbook data: For each segment: effort and catch per area • Geographical data: Coordinates of areas selected in case study
11.What are the outputs?	• The result is a listing of the objectives that can be reached under a certain scenario. Win-win, but also trade-offs are possible. Win-win and trade-offs can be determined based on for instance estimation of several economic indicators, like net profit and gross value added for the selected fleet segments for the desired time period (maximum of 100 years)
12.Which trade-offs?	The model look at competing claims for space of several sectors operating in the case study area. Sectors taken into account are fisheries, aquaculture, Natura 2000 parks and windmill parks. The model then calculates how the competing claims of the other sectors will influence the behaviour of the fishery sector.
13. Possible co-operation within KB	• There is cooperation with IMARES • There is as such a clear recognition of links of this model and the concepts of Competing Claims
14. On CC Website?	Yes

14.3	**LUPIS** Irina Bezlepkina (LEI)
1.Abstract	Land use changes in developing countries are considered critical to sustainable development; and land use policy is an important tool to control land use conversion. In order to address land use change, it is essential to understand the impact of land use policy on sustainable development. The institutional context determines whether the selected polices can be effectively and successfully implemented. To understand the complexity of interacting factors, an integrated approach is required, drawing on various disciplines and assessing the combined effects of socio-economic, environmental and institutional factors. For the ex-ante analysis of land use policies for sustainable development in developing countries assessment procedures are provided. These make use of a generic and flexible analytical framework that enables understanding of the effect of different land use policies on sustainable development. This analytical framework covers all the necessary steps in an ex-ante impact assessment - from problem identification to communication of assessment results.
2.Instrument	• The ex-ante impact assessment consists of three steps: pre-modelling, modelling and post-modelling • A problem is defined and then the scientist tries to model with available tools: crop model, farm model, etc. • It also includes MCA – Multi Criteria Analysis, the weighing of various criteria according to their importance. It is also to decide on trade-offs. • LUPIS is a baby of SEAMLESS and SENSOR developed for the EU (crops in EU-regions). It has been developed as a separate tool, with the idea in mind that different models can better be linked to each other than be integrated completely.
3. Category NE-DEED	All steps: exploration of different policy options
4.Multi-disciplinarity	It involves social, ecological and economic aspects
5.Transition	Sustainable land use
6.Stakeholder orientation	• Stakeholders are involved while formulating problems and possible scenarios. • Stakeholders decide on the Multi-Criteria analysis: the weight of the criteria. • They are also involved in the interpretation of model results.
7.Role in negotiation process	Post-modelling phase needs more emphasis: discussions with policy-makers on the impacts of several options; or people of different ministries discussing the same topic.
8. Multi-level character?	• LUPIS works at country level. It links the global level to the national level. • LUPIS was designed for developing countries and it could work at different levels, not only the national level. • However, data requirements are high and expertise for modelling is necessary (social, ecological and economic aspects integrated). • Integrated approach is a strong asset. However, institutional indicators are difficult to quantify.
9.Role of scientists	• Scientists involve the stakeholders. • Knowledge broker: from story lines to scenarios and models • Post-modelling phase needs improvement.
10.What are the data inputs?	Since there are multiple tools, it is difficult to specify inputs and outputs (they will be mixed per scale of assessment – differ per case study)
11.What are the outputs?	Reidsma, P.; König, H.; Feng, S.; Bezlepkina, I.; Nesheim, I.; Bonin, M.; Sghaier, M.; Purushothaman, S.; Sieber, S.; Ittersum, M.K. van; Brouwer, F.M. (2011) 'Methods and tools for integrated assessment of land use policies on sustainable development in developing countries' Land Use Policy 28 (3). - p. 604 - 617.
12.Which trade-offs?	Different land uses for agriculture, forestry biodiversity
13. Possible co-operation within KB	There is a need for standardization of modules for models. A kind of USB so that additional modules simply can be plugged in.
14. On CC Website?	http://www3.lei.wur.nl/lupis/

14.4	**Biofuel developments in Mozambique: policy, potential and reality** Marc Schut (DSS)
1.Abstract	This project provided general support via a 'technical secretariat' towards the development of a biofuel sustainability policy for Mozambique. This involved the formulation of sustainability principles, criteria and a guide to implement the biofuel sustainability framework
2.Instrument	• Research on geographical dispersion of biofuel developments vis-à-vis the biophysical production potential of biofuel crops in Mozambique • Analysing biofuel investment proposals vis-à-vis employment generation, diversification of the Mozambican energy matrix and yield potential • Analysis of biofuel policy and other related policies; food security policy, energy security policy, (trade) agreements, etc. • Farming system analysis to explore the potential for smallholder biofuel production, local marketing and use • Presenting results in maps (easily understandable – 'boundary object').
3. Category NE-DEED)	• Describing and explaining what is driving biofuel developments in Mozambique • Exploring and designing policy options to enhance the sustainability of biofuel developments in Mozambique
4.Multi-disciplinarity	The research encompasses many disciplines
5.Transition	Towards sustainable energy and enhance the contribution of research to more sustainable and dynamic policy development
6.Stakeholder orientation	The results are being used by 4-5 ministries in Mozambique, and the project collaborates with civil society and private sector stakeholders.
7.Role in negotiation process	The output is used for the development of new biofuel policies in Mozambique and facilitates negotiations around that process. The scientific data is translated into understandable 'language' e.g. by using maps during presentations. The ultimate result is a set of sustainability criteria for biofuel projects
8. Multi-level character?	It deals with criteria for sustainability developed by EU, the Netherlands and others, and national criteria (Mozambique) to be developed. Consequently, local experiences with biofuels (those of both commercial and smallholder projects) were included to ensure that the policy would be realistic and implementable in Mozambique. The project also addressed the question what part of biofuel to be exported, and what part to be used for national consumption. For determination of national criteria trade-offs had to be made to satisfy the EU-criteria.
9.Role of scientists	• Facilitate the process, bring in results of research in an understandable way, help to lift obstacles, if the process stops for one or another reason. This role was supported by development agencies like DGIS (through the Dutch embassy) and GIZ. The scientific community did not stimulate it, but did not oppose either. Important aspects: credibility, legitimacy, relevance of research. • If you position yourself in the triangle policy-research-practice, you can contribute to solving many problems around competing claims. • You need space to move. That does not easily fit the traditional science community
10.What are the data inputs?	• Investment proposals • Interviews and questionnaires • Fieldwork observations • Secondary data such as policy documents, reports, but also newspaper clippings and web-based resources

11.What are the outputs?	• Maps
	• Scenarios
	• More-specific research question
	• Policy advice
	  • Biofuel sustainability principles and criteria
	  • Guide for implementation
	• Scientific reports and articles
	• Follow-up project proposal (June 2011 – July 2012)
	• Presentations at policy meetings (SADC)
	• Presentations for civil society and private sector stakeholders

12.Which trade-offs?	• Different land uses for agriculture (food, feed and/ or fuel), nature conservation, forestry • Competing claims on water (needs more attention!!) • Competing power claims • Competing claims on financial resources (donor-preferences)

	• Long-term sustainability versus short-term developments • Policy-dilemma: Comply with donor-demands/ international criteria versus contextualising the concept of biofuel sustainability to fit the specific needs of a country
13. Possible co-operation within KB	• More attention is needed for implementation of policies. A policy solution or technology can be perfect in design, but eventually never really effective if not properly implemented. The NE-DEED should therefore include some sort of Implementation and Monitoring and Evaluation component, although the latter (M&E) could form part of de new 'Describe'-phase.
14. On CC Website?	

16.1	**MASPNOSE** Arie van Duijn (LEI)
1.Abstract	Marine Spatial Planning at the North-Sea. At the moment the EU does not have any spatial competence at sea. Should there be a directive in order to coordinate different initiatives in the different parts of the sea influenced by different EU member states? The project deals with two sites: • Thorton Bank: work with governments and other stakeholders • Doggersbank: with stakeholders from fisheries and interest groups and governments
2.Instrument	National responsibilities versus a cross-border approach. National processes have nowhere fully been described. So an analysis/comparison is being made between the national processes. • Biophysical data, laws and regulations, national processes • Case studies • Comparison of national processes; comparison of case studies and national processes • Dissemination of results
3. Category NE-DEED	Describe, Explain, Explore and Design
4.Multi-disciplinarity	Fisheries, Geography, Economics
5.Transition	Sustainable food security, Environment
6.Stakeholder orientation	Many stakeholders will be involved. In the first year various stakeholder meetings will be organised
7.Role in negotiation process	Political situation for cross-border solutions is in some cases difficult.
8. Multi-level character?	The supra European, European, Regional and national levels at sea.
9.Role of scientists	Delivering information, initiating, facilitating and coordinating
10.What are the data inputs?	• Data per country with emphasis on laws and processes
11.What are the outputs?	• Initial assessment report, A vision for MSP in a cross-border area (incl. a model test case of the function and usefulness of MSP in a cross-border area), review and assessment of the cross border-MSP process in the two sites (incl. experience with the EU's key principles for MSP).
12.Which trade-offs?	Spatial planning at sea: Natura 2000, fisheries, wind farms, etc. However, the project is not so much about what is traded off against what in a cross border context as the process that occurs in order to achieve the final result and to what degree this conforms to the EU's key principles for MSP.
13. Possible co-operation within KB	• More attention is needed for implementation of policies
14. On CC Website?	yes

16.2	**Sea at sight: spatial planning, institutional frameworks and ecosystem management** Luc van Hoof and Martin Pastoors (IMARES)*
1.Abstract	development of an integrated framework for spatial planning at sea to be used in an interactive way by stakeholders. More and more the sea is used for functions that used to be on land: wind energy, sand exploitation, CO2 storage. Traditional uses get more intensive. At the same time also biodiversity has to be preserved
2.Instrument	Workshops and ateliers Decision Support Systems
3.Com Cl Category (DEED)	
4.Multi-disciplinarity	Yes, because of the different uses of space at sea.
5.Transition	
6.Stakeholder orientation	• Traditional (shipping, fisheries) and new users of space at sea. New ones include wind energy and large scale sand exploitation • Governance of participatory processes is an important element • target group are different parties within governmental organisations. • Much emphasis on interactive participatory approach.
7.Role in negotiation process	Spatial planning is the result of a negotiation process. Scientists can sometimes play a role as facilitators in such a process. More often, scientists are the data and information delivery actors in a spatial planning process.
8. Multi-level character?	at sea: national, local, regional, and international
9.Role of scientists	Research but also facilitation of the stakeholder process
10.What are the data inputs?	• Many types of data may be required: geomorphological, hydrology, ecology, human uses, human impacts, stakeholder analyses, governance studies.
11.What are the outputs?	• Analysis of participation processes and best practices. • Integrated framework for trade-off analyses and general approaches for marine spatial planning.
12.Which trade-offs?	Different uses of the sea, like wind energy. Sand exploitation, fisheries, ship corridors, conservation of biodiversity
13. Possible co-operation within KB	• MASPNOSE (see 16.1), ODEMM,
14. On CC Website?	Yes

Annex 2: Generic and Specific Tools

The annex describes some tools and models in Competing Claims projects. They have sometimes been used for quite a long time and can be considered as building blocks within projects or bigger instruments / models. We have divided these into two categories: the generic ones, not specific for natural resources, and the ones developed for natural resources.

Generic tools

CGE (Computable General Equilibrium) model is a modelling tool for the regional, national or global level. CGE models are used to assess the impacts of exogenous shocks and policy changes transmitted through different but interconnected markets. The starting point for the CGE model is the circular flow of commodities in a closed economy. The main actors presented in the economy are i) the households, who own the production factors and are the final consumers, ii) the firms, who rent the factors of production to produce commodities and iii) the government, who collects the taxes and distributes the revenues. The realistic economic data needed to solve numerically the CGE model are arranged in a SAM (Social Accounting Matrix)**.** Each economic account has both a row and a column in the matrix. The expenditures for each account are recorded as column entries while the incomes for each account are recorded as row entries. The cells identify the magnitude, source (expenditure) and destination (income) account of a transaction. SAMs as analytical tools were originally used mostly for national accounting purposes, but later applied at regional and local levels.

Cost-benefit analysis. The most comprehensive form of regulatory analysis. The total benefit and total costs are calculated, and if the benefits exceed the costs the regulation should be anacted. The advantage of the approach is that it reflects both favourable and adverse effect of a regulation. The disadvantage is that some important benefit components may not be quantified and consequently given less weight.

Cost-effectiveness analysis. Cost-effectiveness analysis calculates the cost per unit benefit but does not assign monetary value to objectives such as equal opportunity, decreased mortality or improved nutrition. This approach eliminates the difficulty of attempting to value all benefits explicitly, at the same time providing comparisons of the costs of different ways of achieving a particular objective. It is particularly useful in weeding out policy alternatives that are clearly inferior, as it provides an index of the relative efficacy of policies in generating benefits. Disadvantage is that the approach takes as a given the desirability of achieving a particular benefit, and therefore it does not resolve the choice of the optimal level of benefits.

Cost assessment. Assessment of the costs of regulation on businesses., consumers, and workers. Here benefits are ignored. May include attempt to ensure that cost levels are not too high. Advantage is that the approach attempts to comprehensively determine the total price society is paying for the regulation and provides insight into its economic feasibility. The approach is not partial and does not provide comprehensive guidance as benefits are ignored.

LCA (Life cycle analysis). LCA is a method of determining the environmental impact of a product throughout the life cycle, 'from the cradle to the grave'. Dozens of researchers within Wageningen UR work on LCAs. These relate to methodological research as well as to applications in plant-based and animal-based products, the biobased economy and aquaculture. The research projects sometimes relate to one of the sustainability themes, such as the carbon-foodprint protocols, or an entire spectrum of environmental topics. All experts within Wageningen UR have joined forces in the Wageningen UR LCA Consortium in order to optimise the exchange of knowledge. See also: ReCiPe.

MCA (Multi-Criteria Analysis) is a tool for evaluation of different alternatives (i.e. scenarios, policy options). It is based on various preferences of criteria (i.e. importance of indicators) that are used for the choice of an alternative. The analysis itself does not choose an alternative; it merely shows the contribution of criteria to the alternatives, based on the weights (preferences) that are given. To carry out a MCA various steps have to be undertaken. The steps can be arranged as follows: Setting up criteria and alternatives in a brainstorm session with expert groups; Building a hierarchical tree based on the brainstorm session; Collect preferences of stakeholders using participatory techniques; Collect outputs

on indicators from models (modelling phase); Carry out the MCA; Evaluate the contributions of criteria to the preferred alternative; Discuss the alternative and test the institutional capability.

SCBA (Social Cost-Benefit Analysis). SCBA is an instrument facilitating the weighing up of all current and future social advantages and disadvantages of various alternatives. The word 'social' indicates that costs and benefits are analysed and valued from the point of view of society as a whole. The focus is not only on the costs and benefits that can be expressed in monetary terms, but also on the costs and benefits which have not (or not yet) been expressed in monetary terms, relating to all kinds of other matters valued by society, such as the environment, safety and nature.

Shift-Share Analysis Shift-share analysis is one way to account for the competitiveness of a region's industries and to analyse the local economic base. This analysis is primarily used to decompose employment changes within an economy over a specific period of time into mutually exclusive factors. It paints a picture of how well the region's current industries are performing by systematically examining the national, local, and industrial components of employment change. A shift-share analysis will provide a dynamic account of total regional employment growth that is attributable to growth of the national economy, a mix of faster or slower than average growing industries, and the competitive nature of the local industries. Like other analytical economic tools, the shift-share technique is only a descriptive tool that should be used in combination with other analysis to provide a summary of a region's key employment potential industries. Once completed, the analysis provides a representation of changes in employment growth or decline, and it is useful for targeting industries that might offer significant future employment opportunities. By interpreting data provided by shift-share, you can explore the advantages your local area may enjoy, as well as identify growth, or potential growth industries that are worthy of further investigation.

Specific tools

CAPRI (Common Agricultural Policy Regionalised Impact analysis). CAPRI is an economic model developed by European Commission research funds. Operational since more than a decade, it supports decision making related to the Common Agricultural Policy based on scientific quantitative analysis. It is a global agricultural sector model with focus on EU27, Norway, Turkey and Western Balkans, iteratively linking: Supply module (EU27+Norway+Western Balkans+Turkey): covering about 280 regions (NUTS 2 level) or even up to ten farm types for each region (in total 1900 farm-regional models, EU27); Market module: spatial, global multi-commodity model for agricultural products, 47 product, 69 countries in 32 trade blocks. The objective is to evaluate exante impacts of the Common Agricultural Policy and trade policies on production, income, markets, trade, and the environment, from global to regional scale. Spatial downscaling for EU27 of crop shares, yields, stocking densities, fertilizer application rates to 150.000 Homogenous Soil Mapping Units (cluster of 1x1 km grid cells) for environmental impact assessment and link to bio-physical model DNDC. Open source approach with an active network of developers and users, main client is the EU Commission.

FISHRENT: This is a bio-economic simulation and optimisation model for fisheries. The model was developed as a part of the EU funded study 'Remuneration of spawning stock biomass'. The model has the following characteristics: Integration of simulation of different management strategies and optimisation of selected objective variables; Combination of output- and input-driven management policies; Flexible number of species and segments to analyse multi-species/multi-fleet fisheries; Link to available economic and biological data allows empirical applications; Balanced composition between various components: biology-economics-policy; Dynamic behaviour over any number of years, including stock-growth, investment and effort functions, allows simulation of adjustment paths; Flexibility for applications of various types of relations (e.g. different stock-growth functions, approaches to payment for access, etc.). The model contains: Options for the collection of rent (payment for access); Large number of features, including parameter for technological progress, discards of sized and undersized fish, various options for simulation of investments, etc.; Six modules: biology, economy, interface, market, behaviour and policy. The feedbacks within the model allow for a dynamic simulation. The main application of the model is scenario analysis of policy options.

FSSIM (Farming Systems Simulator) is a generic bio-economic farm model. It can be applied in combination with higher level models to assess farm level impact of future policy scenarios for different farm types in different regions. It is an optimization model which maximizes a farm's total gross margin subject to a set of resource and policy constraints. Total gross margin is defined as total revenues

including sales from agricultural products and subsidies minus total variable costs from crop and animal production. Total variable costs include costs of fertilizers, costs of irrigation water, costs of crop protection, costs of seeds and plant material, costs of animal feed and costs of hired labour. A quadratic objective function is used to account for increasing variable costs per unit of production because of inadequate machinery and management capacity and decreasing yields due to land heterogeneity.

FoPIA (Framework of Participatory Impact Assessment) is a tool for impact assessments of alternative land use scenarios, which draws on the knowledge and expertise of stakeholders. The implementation of this approach at case study level follows three main steps: i) scenario development, ii) specification of the sustainability context, and iii) impact assessment. Stakeholder participation is at the core of this method and considered in each assessment step. FoPIA comprises two assessment directions: firstly, a discursive examination of causal relationships and attributions of changes between human activities and regional SD targets, and secondly, the exploration of scenario impacts and possible trade-offs on selected sustainability criteria at regional level.

GTAP (Global Trade Analysis Project) is a comparative static, multi-sector, and multi-region general equilibrium model developed by the GTAP consortium (www.gtap.org). In SEAMLESS the agricultural sector model (SEAMCAP) and GTAP have been conceptually linked in a flexible and generic manner (in the sense of not being focussed on a one-off application). The linking aims at combining the strength of CAPRI in detailed modelling of the EU agricultural sector with the economy-wide modelling of GTAP. The combination of the two models allows assessing in detail the impacts of changes in the overall economy on the agricultural sector in the EU as well as the impact of changes in this sector on the overall economy.

GLOBIOM (Global Biomass Optimization Model) is a global recursively dynamic partial equilibrium model integrating the agricultural, bioenergy and forestry sectors, developed by IIASA (International Institute for Applied Systems Analysis). It aims to give policy advice on global issues concerning land use competition between the major land-based production sectors (Crops, Livestock, Ruminants, Forests). It is a spatial price equilibrium model. This kind of model is useful for the prediction of commodity trade flow patterns between spatially separated supply and demand markets. It is assumed that goods are homogenous and that markets are perfectly competitive. Tariffs and transportation costs are introduced and are differentiated among each pair of partner and for each product. There are currently 28 regions included in GLOBIOM, covering 181 countries. Land and its characteristics are the key elements of the modeling approach. In order to enable global bio-physical process modeling of agricultural and forest production, a comprehensive database has been built which contains geo-spatial data on soil, climate/weather, topography, land cover/use, and crop management (e.g. fertilization, irrigation). The data are available from various research institutes (NASA, JRC, FAO, USDA, IFRPI, etc.) and significantly vary with respect to spatial, temporal, and attribute resolutions, thematic relevance, accuracy, and reliability.

IMPACT (International Model for Policy Analysis of Agricultural Commodities and Trade) is a freely available model of international agricultural trade, developed by IFPRI (International Food Policy Research Institute). It original aim was to bridge the gap of lacking long-term vision and consensus among policy makers and researchers about the actions that need to be taken to ensure world food security in the future and to protect the natural resources. IMPACT examines the links between food production and consumption and food security at the national level. The source of production and consumption data of the model is the FAOSTAT database, population data are taken from the UN and elasticities and growth rates are obtained from literature reviews and expert estimates. Most price data are obtained from the World Bank. IMPACT divides the world into 36 countries and regions. Supply, demand and prices of 32 agricultural commodities are determined within each country or region. The link between countries or regions is through trade with a separate, unique "world market" for each commodity. The world price of a commodity is determined annually at levels that clear international market.

LEI models for agriculture and economy: At LEI several different quantitative models are being used. In many projects more than one model is used and in some cases information from one model is explicitly used in another model. MAGNET is a global general equilibrium model of the world economy with the country as the maximum level of detail. It describes the world economy as a whole. Orange is a national general equilibrium model of the Netherlands, with a lot of detail in sectors. At the next level are

the models of the agricultural sector with a focus on Europe. Both ESIM, AGMEMOD, CAPRI and HORTUS are focused on the European economy, where the rest of the world is one region. They have a lot of detail in the agricultural sector, but have no non-agricultural sector. Both ESIM and AGMEMOD model agriculture at a national level. ESIM follows a fixed elasticity approach mainly based on literature and AGMEMOD estimates national equations that have a rough template in common, but allow for differences in functional form between countries. CAPRI models the agricultural sector at NUTS2 level. Hortus models the horticulture sector only, but with a lot of detail for European countries. The next level is focused on the Netherlands. DRAM provides much more detail of the agricultural sector in the Netherlands than CAPRI, with smaller regions and much more sectoral detail. It includes a manure market, specifically relevant for the Netherlands. MAMBO calculates manure and its environmental effects in a lot of detail. The bottom level is the farm level. FIONA is a dairy farming model with a focus on analysing the effects of nature policy. FES is basically an accounting model with a rudimentary investment equation.

Multi-stakeholder Process (MSP) approaches (Nico Rozemeijer et al. CDI) Competing claims on natural resources are made by stakeholders. Addressing these claims and finding solutions will benefit from participation of these stakeholders (from local to global). Joint visioning, joint building of theories of change, joint strategic planning, negotiation and joint decision-making are likely to be more effective and sustainable in the long run than formal, top-down or unilateral approaches. Multi-stakeholder process approaches generally help to inform and more equitably balance decision-making, invoke collaboration and institutionalise solutions. More egalitarian and network-based communication among all parties for example at community level, in producer associations, at landscape level may increase acceptance and balancing of each other's competing claims. The approach is represented in CDI project Competing Claims on natural resources. Examples include:

- Collaborative natural resources management approaches that serve much more than only conservation agendas but proactively bring out and satisfy also the social, economic and cultural interests of the co-managers (across scales);
- Co-creation of knowledge and social learning;
- Participatory planning processes in open and democratic societies;
- Interactive policy making.

The process facilitation is most of all social oriented, but technical, ecological, institutional and economic considerations can and will be brought in as part of the process. The core of the approach is dealing with different stakeholders and their interests. It is all about managing the negotiation process. The scientist is facilitator of the process of interaction between stakeholders. The approach can be used in more projects (http://portals.wi.wur.nl/msp/)

PRIMES (Primary Energy Supply). This model is a detailed agent based and price driven model of the energy system covering in total 35 European countries. It is modular system with individual sub-models for several demand sectors and energy supply system, including a detailed electricity, CHP, gas, RES and biomass models. The integrating module simulates simultaneous market equilibrium. The model projects dynamically to the future energy balances, investment costs, prices and emissions per country. It projects also the flows of electricity and gas among all countries. The energy system model has been developed by the Energy-Economy-Environment modelling laboratory of National Technical University of Athens in the context of a series of research programmes of the European Commission. From the very beginning, in 1993-1994, the PRIMES energy model was designed to focus on market-related mechanisms influencing the evolution of energy demand and supply and technology penetration in the markets. The model was continuously extended and updated to study medium and long term restructuring of the EU energy system, in view of climate change, RES, energy efficiency and other Community energy and environmental policies. PRIMES perform a full scale representation of the energy system, in its current and possible shape in the future, covering all sectors and technologies. However, the model does not close the loop with the rest of the economy. This justifies characterizing the model as a partial equilibrium model, contrasting general equilibrium models, like GEM-E3 and others, which however represent the energy system in an aggregate way lacking also engineering evidence.

ReCiPe ReCiPe provides a recipe to calculate life cycle impact category indicators. The acronym also represents the initials of the institutes that were the main contributors to the project and the major

collaborators in its design: RIVM and Radboud University, CML, and PRé Consultants. Life cycle inventory assessment (LCA) is a methodological tool used to quantitatively analyse the life cycle of products/activities. ISO 14040 and 14044 provide a generic framework. After goal and scope have been determined and data have been collected, an inventory result is calculated. This inventory result is usually a long list of emissions, consumed resources and sometimes other items. The interpretation of this list is difficult. An LCIA procedure, such as the ReCiPe method is designed to help with this interpretation. It transforms the long list of Life Cycle Inventory results, into a limited number of indicator scores. ReCiPe calculates eighteen of midpoint indicators, but also calculates three much more uncertain endpoint indicators. The motivation to calculate the endpoint indicators, is that the large number of midpoint indicators are difficult to interpret, partially as there are too many, partially because they have a very abstract meaning. How to compare radiative forcing with base saturation numbers that express acidification? The indicators at the endpoint level are intended to facilitate easier interpretation, as there are only three, and they have a more understandable meaning. The idea is that each user can choose at which level it wants to have the result: Eighteen robust midpoints, that are relatively robust, but not easy to interpret; Three easy to understand, but more uncertain endpoints: Damage to Human health, Damage to ecosystems, Damage to resource availability. The user can thus choose between uncertainty in the indicators, and uncertainty on the correct interpretation of indicators.

RESolve (Renewable Energy Sector): The RESolve model kit of ECN consists of three independent sector models, known as RESolve-T, RESolve-E and RESolve-H for the transport, electricity and heat sector respectively. Each of these models has a specific renewable energy demand. Part of this demand might be filled in using biomass as feedstock. By making the three models interact within an iterative scheme it is possible to assess the most economic ways of allocating biomass among the three different sectors. The initial supply is determined by the amount of land that is available for growing energy-related biomass (this is an external input); the produced biomass is then converted into energy commodities and products that can be sold in the market. Competition among different biomass sources, as well as among different energy sources will take place within the different demand sectors. The demand sectors electricity, transport and heat are considered in the model. This means that the potentials only include biomass for energy generation; other important uses of biomass (such as e.g. food and biochemicals) are not considered in the model.

SEAMLESS-IF (Science for Integrated Assessment of Agricultural Systems in Europe - Integrated Framework). SEAMLESS-IF facilitates translation of policy questions into alternative scenarios that can be assessed through a set of indicators that capture the key economic, environmental, social and institutional issues of the questions at stake. The indicators in turn are assessed using a linkage of quantitative models. These models have been designed to simulate aspects of agricultural systems at specific scales, i.e. point or field scale, farm, region, EU and world. Application of the models requires pan-European databases for environmental, economic and social issues. Some indicators, particularly social and institutional ones, will be assessed directly from data or via a post-model analysis. The linkage of models designed for different scales and from biophysical and economic domains requires software architecture, and a design and technical implementation of models that allows this. The software backbone of the project, SeamFrame, serves that purpose. SeamFrame is also developed to facilitate re-use, maintenance and documentation of models. The project has been set up in response to a research and policy need formulated by the European Commission.

SPARD (Spatial Analysis of Rural Development Measures): The aim of the SPARD project is to develop a modelling tool that will help policy-makers to understand the causal relationships between rural development measures and their results in a spatial dimension. Based on spatial-econometric analysis it will include ex-post evaluation options and the possible extension to ex-ante assessment with the purpose of giving support to the planning of targeted RD policies, programmes and measures. The project will compile a well-structured database, to organise both indicators from the Common Monitoring and Evaluation Framework (CMEF), distinguishing input, output, result, impact and baseline indicators, and other data specifically used by the RD management authorities in the Member States (MS), and extrapolate missing indicator values. The emphasis of the project will be the development of an analytical framework that considers characteristics and needs of target areas and target groups. The key task of the project is to develop a quantitative model, using spatial econometric modelling. This will allow the identification of causal relationships of RD policy implementation. In this manner the cost-effectiveness of RDPs can be analysed in their spatial dimension. Evaluations/assessments of selected policies and measures and their impacts will be made at the EU-27 scale. Furthermore it shall be demonstrated that

the methodology is feasible at different scales of application and levels of data aggregation. Validation of the modelling framework will be carried out in 5 case study regions. The end product of SPARD will be a multiple-option and variable-scale Decision Support Tool capable for use in horizontal and vertical evaluations. As a collaborative project, SPARD will make efforts to broaden the proved expertise of the consortium by integration of stakeholders, external experts and end-users in the overall process.

Waterwise is a Planning Tool for Adaptive Land and Water Management. The modelling system attempts to provide an alternative for 'conventional' simulation models. Instead of (yet another) simulation system it provides a framework for answering 'inverse' policy questions. Simulation models can be used for answering questions of the type: 'What is the effect of removing field drainage on a neighbouring nature area?'. The inverse question would be: 'Where should I remove agricultural field drainage to protect a wet nature area, and at the same time keep the income reduction of agriculture as low as possible?'. Waterwise can answer such questions and at the same take various types of stakeholder preferences into account. The modelling system can be implemented in a simple or a sophisticated manner: by filling the model equations using simple cause-effect relationships; or by using simulation models for performing computational experiments and then feeding the results into Waterwise. The system has been implemented for the Beerze and Reusel region in the Netherlands, for a subbasin of the Elbe (Wipper) and for the Nile Basin (operational prototype). Suggested solutions can be counterintuitive, thus deepening the insight into the regional system functioning. The approach can also help in obtaining stakeholder support, because the provided analysis is not only used 'against' certain groups.

WIBIS The WIBIS tool is an open-source web application with which the user can evaluate the implications of land use scenarios. The interactive tool is accessible to any authorized user, whereas others can freely browse through the existing data presented in the tool. It generates on-line an extensive set of maps with land and water indicators, which are continuously updated as long as the user is working with the tool. In the current version 15 land use types are distinguished. These include 9 cultivated land uses (agricultural crops and forest plantations) and 6 other uses (nature lands and built areas). The Incomati basin is subdivided in 24 regions. Whilst working with the tool the user can adapt any land use. The tool will then calculate the expected water consumption (mm), biomass water productivity (kg/m3), crop water productivity (kg harvestable yield/m3) and economic water productivity (R/m3) in each region, as well as the available water to downstream regions. This is done on an annual basis, through water accounting. The economic water productivity is calculated on the basis of market prices and production costs (per region). The user can compare the value of various land and water indicators in a wet, dry and average year. For the 15 land use types the regional differences in water consumption, biomass production and water productivity can be presented. For the 24 regions the rainfall, reference evapotranspiration, rainfall surplus and existing monitoring data can also be displayed. The WIBIS tool can assist in prioritizing land uses and can also be used in a trans-boundary context. The WIBIS tool is based on a consistent method and impartial information, using satellite images. Actual evapotranspiration and biomass production are calculated on a monthly basis with the SEBAL algorithm applied on MODIS images, having a spatial resolution of 250x250 m. Rainfall is retrieved from the Tropical Rainfall Measurement Mission (TRMM), which carries a precipitation radar. All these monthly (as well as annual) data can be consulted with the WIBIS tool (hence at grid level).

Annex 3: INREF programme Competing Claims on natural resources

Competing Claims on natural resources is an interdisciplinary research programme funded by the International Research & Education Fund (INREF) of Wageningen University in The Netherlands..

Competing claims on natural resources become increasingly acute, with the poor being most vulnerable to adverse outcomes of such competition. A major challenge for science and policy is to progress from facilitating univocal use, to guiding stakeholders in dealing with potentially conflicting uses of natural resources. The development of novel, more equitable, management options that reduce rural poverty is key to achieving sustainable use of natural resources and the resolution of conflicts over them.

This interdisciplinary research programme aims to develop and interactive methodological approach for the:
1)Understanding of competing claims and stakeholder strategies;
2)Identification of alternative resource use options;
3)The scientific support to negotiation processes between stakeholders, with the aim to develop policy interventions that simultaneously improve livelihoods and the sustainable use of natural resources.

Research is conducted in southern Africa, a region characterized by heterogeneous and highly dynamic resource uses. A comparative approach will be used to examine the different drivers of resource use dynamics and the interacting claims of multiple stakeholders on these resources. Three countries are included in the programme (South Africa, Mozambique and Zimbabwe) in order to capture contrasting, yet interlocking, socio-political and institutional environments in which competing claims are played out (while agro-ecological conditions remain fairly similar).

Concepts & methodology
In the last decade, scholars and practitioners have become increasingly disappointed regarding the dynamics and outcomes of participatory processes. Critiques on conventional participatory approaches include:

- A failure to properly anticipate dynamics of power, conflict and politics;
- The tendency to assume that 'intervention projects' introduced from outside are a main carrier of change, while processes of self-organization are underrated, and;
- A singular focus on the 'local' level, while higher-level constraints are not taken into account.

A central premise of the Competing Claims conceptual framework is that, in order to contribute to societal change, scientists must actively contribute to negotiation processes between stakeholders operating at different scales – local, national, regional and global. Global and national policies structure the space within which local responses can be generated.

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Programme coordinator, The Netherlands, Maja Slingerland, Plant Production Systems, Wageningen University

www.competingclaims.nl/CC/Home.html