Capitalisation of research results

on the multifunctionality of agriculture and rural areas

How can multifunctionality be implemented and assessed?

Results of the workpackages WP3 and WP 6

Multagri final seminar

Brussels, 1st of September 2005

Peter Zander, WP3 – Knowledge, models and indicators
Karlheinz Knickel, WP6 – Policy evaluation tools

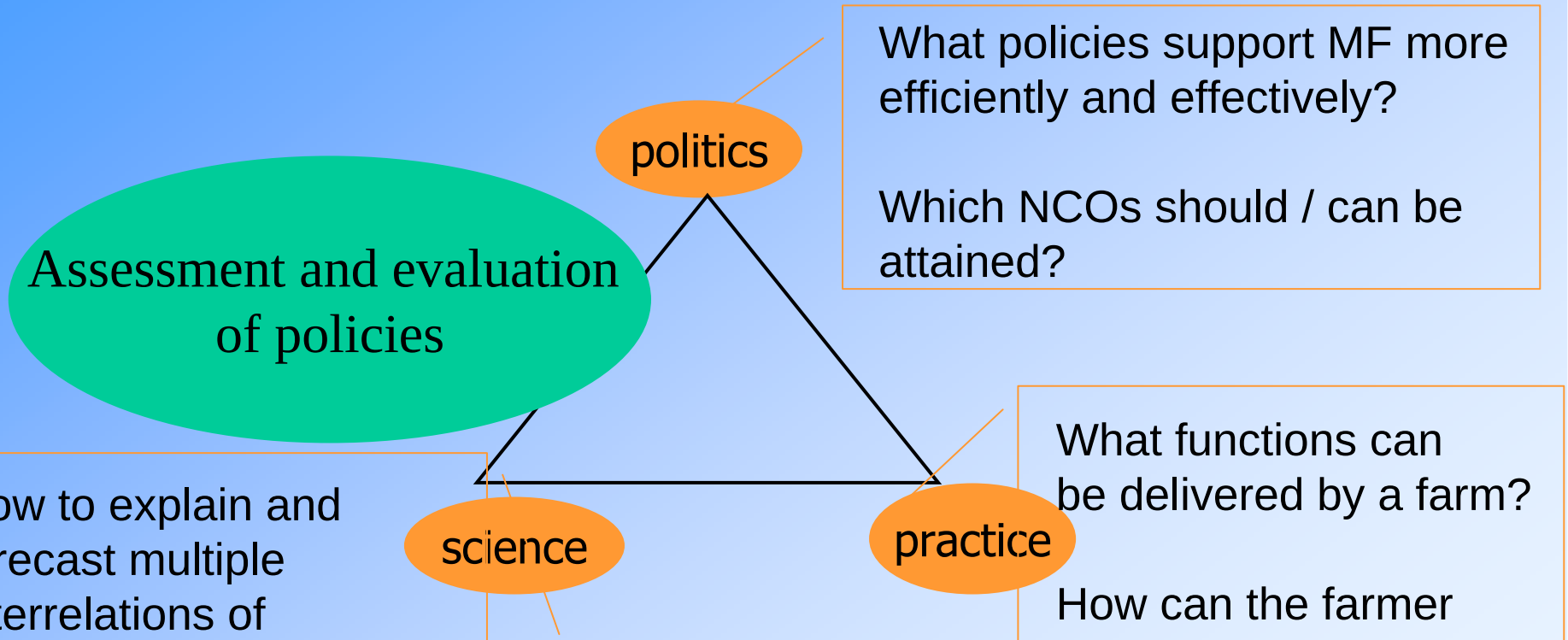
Special thanks to Andrea Knierim, WP3; Emilie Coudel, Dominique Cairol and the members of WP 3 and WP 6

How can multifunctionality be implemented and assessed?

1. Introduction
   - Perspectives of policy, science and practice
2. Assessment of MFA policies
   - Objectives and types
3. Tools and models to explain and forecast MFA
   - Analytical framework
   - Examples

1 Introduction

Three perspectives to appreciate and assess MF



What policies support MF more efficiently and effectively?

Which NCOs should / can be attained?

How to explain and forecast multiple interrelations of functions?

How to assess relevant policies and their effects, ex ante and ex post ?

What functions can be delivered by a farm?

How can the farmer attain remuneration?

How can regional level MF be realised?

Types and Objectives

Summative - Formative evaluation

Summative evaluation

- Check and control by external experts
  - Financial accountability
  - Programmes progress

Formative evaluation

- Improvement of programs (Mid-term evaluations)
- Self-evaluation to strengthen rural development processes

2 Assessment of MFA policies

Types and Objectives

Experiences up to now

Analysed levels and functions differ widely over countries

Assessments found:

1. Focus the multiple impacts of policies on agriculture, local communities and the environment
2. Concentrate on the multiple uses of rural space
3. Examine the contribution to a sustainable agricultural development
4. Analyse efficiency and effectiveness of policies and institutional arrangements.

2 Assessment of MFA policies

Types and Objectives

Ex ante - ex post

- Ex ante ⟹ future developments
- Mid-term ⟹ improvement and adjustment
- Ex post ⟹ current situation as a consequence of prior decisions and actions.

2 Assessment of MFA policies

An economics-related perspective

Supply and demand of non-commodities

	NCO – Supply	NCO – Demand
Ex ante assessment	Simulation of land use by bio-physical models and models of farmers‘ decision making Interactive m… approaches	Direct economic valuation Qualitative prognoses
Ex post assessment	Empirical land use… based modelling Surveys Statistical data analysis	…onomic valuation Qualitative surveys Statistical data analysis

Integrative studies
Belgium, France …

2 Assessment of MFA policies

Qualitative methods

- Qualitative methods are central in most policy evaluations
  - case studies;
  - literature review,
  - interviews and postal/telephone surveys;
  - workshops
  - focus groups
- First LEADER programmes – "an experimental programme"
  - Innovative evaluation methods by integration of stakeholders :
    - self-evaluation

The Italian report: ... "the concept of evaluation should be conceived as a process of interaction between policymakers and evaluators and not an activity merely directed to the production of an evaluation report"

3 Tools and models to explain and forecast MFA

Bio-economic models

Why?

- Interrelation
- Complex decision making system based on economic rationality
- Complex ecological systems based on site specific interrelations with production practices
- Perspective to cover large areas: ex ante, quick and simultaneously

⇒ EU-6th FW: MeaScope, SEAMLESS

3 Tools and models to explain and forecast MFA

Bio-economic models – Analytical framework

Categories of the analytical and evaluative framework

1. General Description
2. Major objectives of the study
3. Intended user groups

System definition

- Spatial and temporal scale: highest-lowest
- Objects describing the system
- Type of results

Investment and continuity

- Ongoing updating of database; component development projects
- Ongoing empirical testing (monitoring/ experimentation)
- Number of projects; Years in use; R&D expenses (person years)

3 Tools and models to explain and forecast MFA

Bio-economic models – Findings 1

- Context and objectives
  - methodology development
  - ex ante evaluation
- Targeted users
  - Policy support and planning (German, Dutch and French)
  - Farmers, (Dutch and French)
  - Citizens (Dutch)
  - Consumers are never addressed
    only as exogenous parameter like in some French approaches.
- Results
  - land use scenarios
  - trade-offs between environmental and economic indicators

3 Tools and models to explain and forecast MFA

Bio-economic models – Findings 2

- Indicators
  - Economic : classical
  - Ecological : abiotic, species, biodiversity,
  - Social : employment
- Methods
  - Economic : programming, MAS
  - Ecological : process based dynamic / static rule based expert assessment
  - Social : by-product of economic models
- Quality
  - >10 years, continued development, validation procedures
  - Regional oriented
  - large data requirements, not easily fed by existing databases

3 Tools and models to explain and forecast MFA

Example 1 - TAO

Relating functions through trade-offs & land use scenarios

International example: Trade-off Analysis Model (TAO)

- A Policy Decision Support System for Agriculture
- By **Montana State University, Wageningen University**, and the **International Potato Center** (CIP), with institutes in Peru, Ecuador.
- Applied worldwide in different natural environments and production systems
- Spatial variability => production choices =>impact on environment and health.
- Econometric optimisation models => relatively limited time horizon.
- Limitations regarding long term effects on soil productivity (e.g. soil erosion)

3 Tools and models to explain and forecast MFA

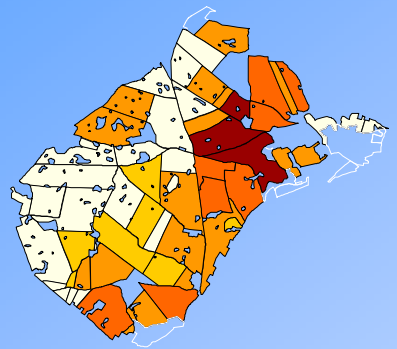
Example 2 - MODAM

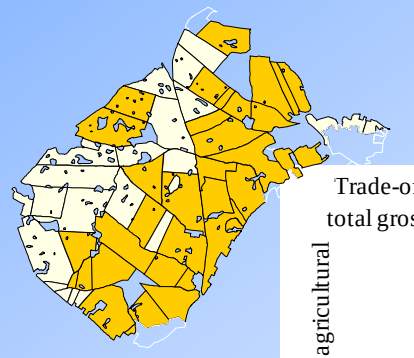
Relating functions through trade-offs & land use scenarios

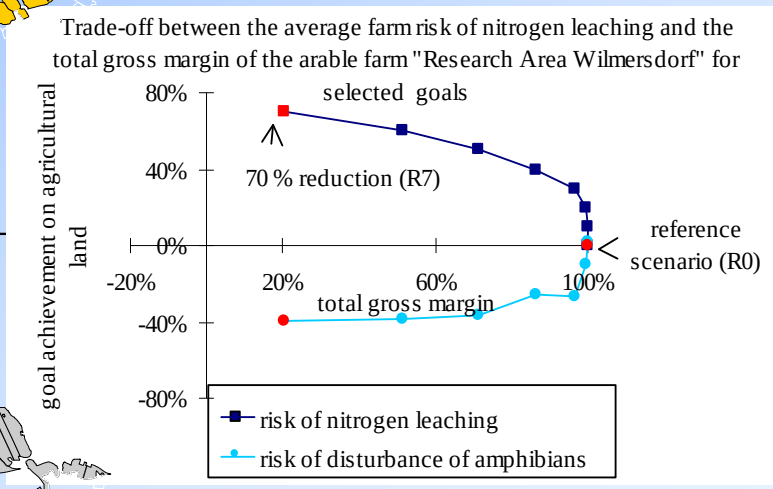
R0 - simulated reference scenario

R7 - 70 % improvement of the risk of nitrogen leaching

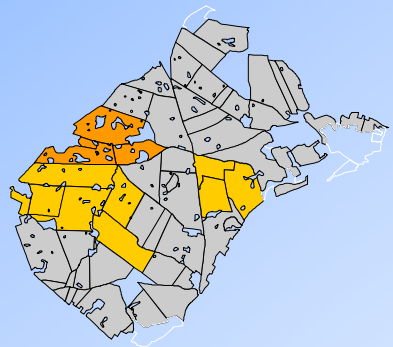
risk of nitrogen leaching

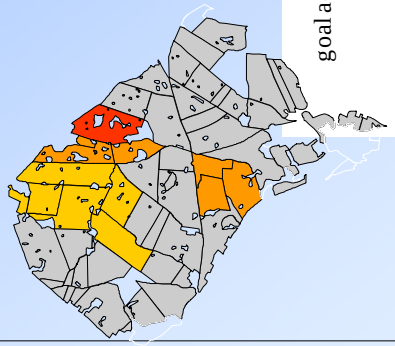






risk of disturbance of amphibians





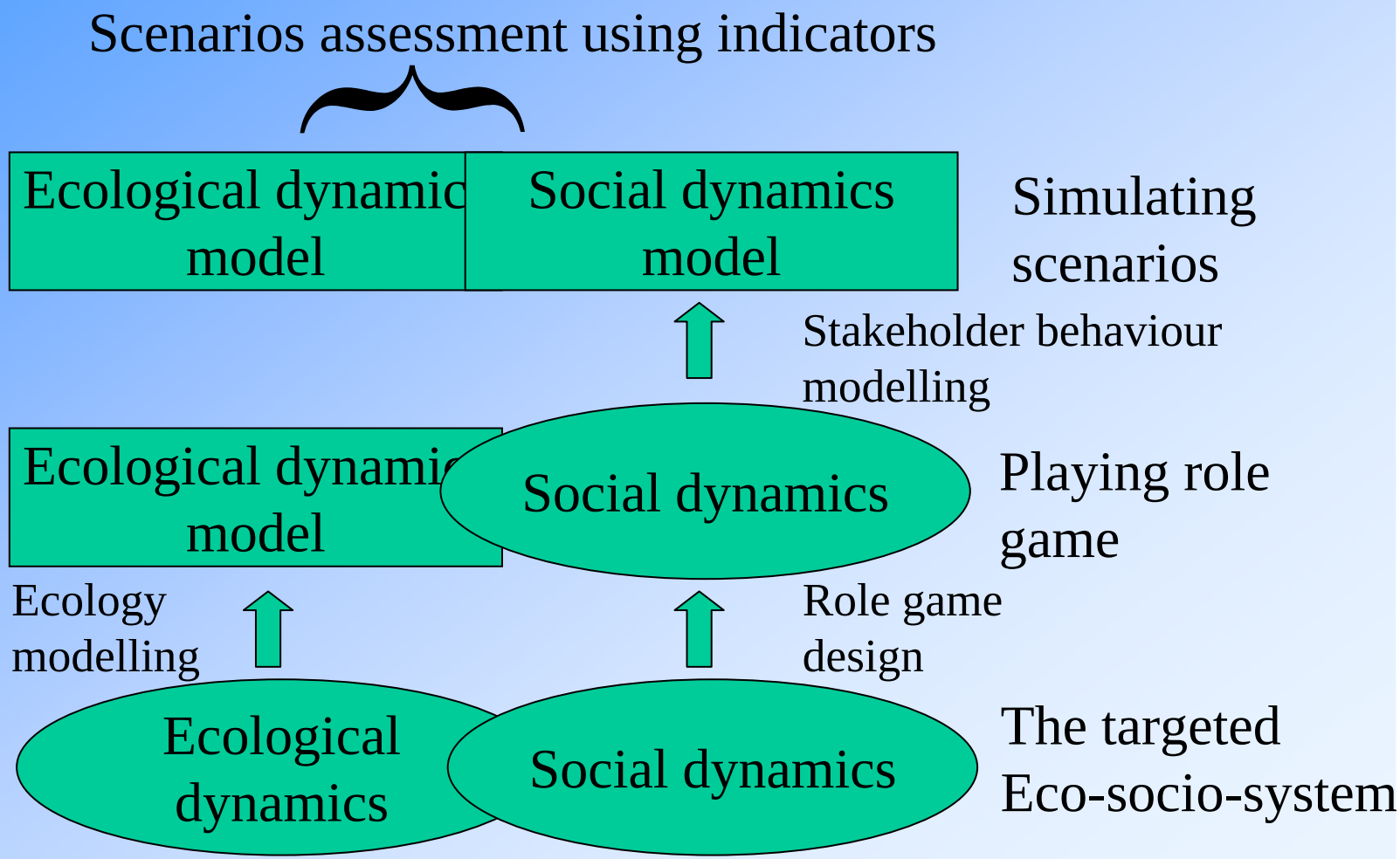
low risk | medium risk | high risk | not relevant

Source: Zander, 2003

3 Tools and models to explain and forecast MFA

Example 3 - Méjean

Interactive scenario-based assessment



Mejean, J.P. Müller 2005

Example 4 - FADN

Farm Accountancy Data Network

„...derived from national surveys, the FADN is the only source of micro-economic farm data that is harmonised" [1]

- FADN covers commercial agricultural holdings in the European Union
- aims to provide representative data along three dimensions: region, economic size and type of farming.

For the support of MF assessment, the **FADN needs to be enlarged** into two dimensions:

- Information about environmental impacts of agriculture to cover the interrelation between production and environment functions and
- Information on diversification of farm households and value added along the supply-chain.

[1] http://europa.eu.int/comm/agriculture/rica/index_en.cfm

4 General conclusions

indicator systems

- The assessment of MF requires a
  - holistic, integrative approach that covers
  - agriculture's pluri-activity, RD and urban-rural relationships.
- Until now, there are no data systems in the EU that allow a sufficient monitoring and evaluation of MF.

Pathways for future research on MF indicators:

1. Region-based assessments of MF, including self-evaluation processes, in combination with meta-evaluation at EU level
2. Adaptation and refinement of existing cross-level indicator systems to the MF approach with a specific emphasis on
   - social indicators
   - agri-biological indicators.

4 General conclusions

modelling behaviour

Policies that address economic rationality

- Can be modelled more successfully than others
- Should be dovetailed with qualitative assessments

Policies that address individual or group specific behaviour like networking, managerial skills or the environmental consciousness

- should be assessed interactively
  - by experts on the basis of Delphi methods and / or
  - in participatory processes.

Complexity requires

- Interactive approaches with stakeholders in value-setting and decision-making

4 General conclusions

modelling functions

- **Production functions**
  - Numerous models prove that they can be modelled successfully
  - Statistical data also allow assessment of production but lack spatial reference and thus do not support ecological impact assessment
- **Ecological functions** of agriculture
  - often have to be modelled in order to be well understood
  - enormous knowledge gaps still exist with respect to the interdependencies of production and the biological systems
- **Social and cultural functions**
  - are characterised by psychological and group processes that
  - render modelling approaches complex and difficult to standardize.

4 General conclusions

evaluation and learning

Evaluation supporting a continuous learning process remains a challenge throughout the member states.

- Evaluation as a learning process requires new structures
  - Experimental setups
  - Self-evaluation as an important part of the evaluation process.
- Making evaluation an opportunity for learning requires
  - A relation more in partnership between the evaluator and the evaluated partners
  - The encouragement of collective learning through a stronger participation of actors.
- In such a learning context, modelling approaches can
  - Enhance the understanding of complex systems and
  - Support decision making by providing land use alternatives (scenarios; trade-offs; transparency of weighing different targets)

Thank you !

4 General conclusions - ex ante, mid-term and ex post assessment

- Ex ante policy assessment
  - possible for impacts of economic instruments on ecological functions,
  - mainly with quantitative methods
- Mid-term evaluation and ex post assessment
  - applying and combining both quantitative and qualitative data.
- Ex post evaluation
  - qualitative methods
  - statistical and administration data
  - supported by ecological models

➢ Complexity requires
  - Interactive approaches
  - with stakeholders in value-setting and decision-making

Interlinkages between public goods provided by agriculture

Eirik Romstad, Arild Vatn, Per Kristian Rørstad & Viil Søyland

	B	CH	O	BM	AL	RA	FS*	FSA	FQ	RS	SE	A	NE
Biodiversity (B)		+	CC	+	CC	(-)	?	?	x	+	x	+/-	-
Cultural heritage (CH)	(+)		+	+	+/(-)	x	?	x	x	+	x	?	(-)
Openness (O)	x	+		x	+	x	+	x	x	+	x	+	x
Borders/mosaics (BM)	(+)	+	CC		x	x	+/-	x	x	+	x	CC	x
Active landscape (AL)	x	+	+	+		+	+	x	x	+	+/-	+	x
Recreation/Access (RA)	x	+	+/-	+	+/-		+/-	x	x	+/-	+/-	+/-	-
Food security (FS)	+	x	x	x	x	x		+	(+)	+	x	+/-	-
Food safety (FSA)	(+)	x	x	x	x	x	+/-		+	+	x	CC	-
Food quality (FQ)	(+)	(+)	(+)	(+)	(+)	x	+/-	+		(-)	x	x	-
Rural settlement (RS)	x	(+)	+	x	x	+	+	x	(+)		x	+	(-)
Scientific/educ. val (SE)	+		+/-	+	+	(-)	?	x	x	+		x	-
Area (ag. land) (A)	x	+	+	-	+	x	+/-	x	x	+	x		-
Neg. ext. effects (NE)	+	(+)	-	+	CC	-	-	+	x	-	x	(-)	

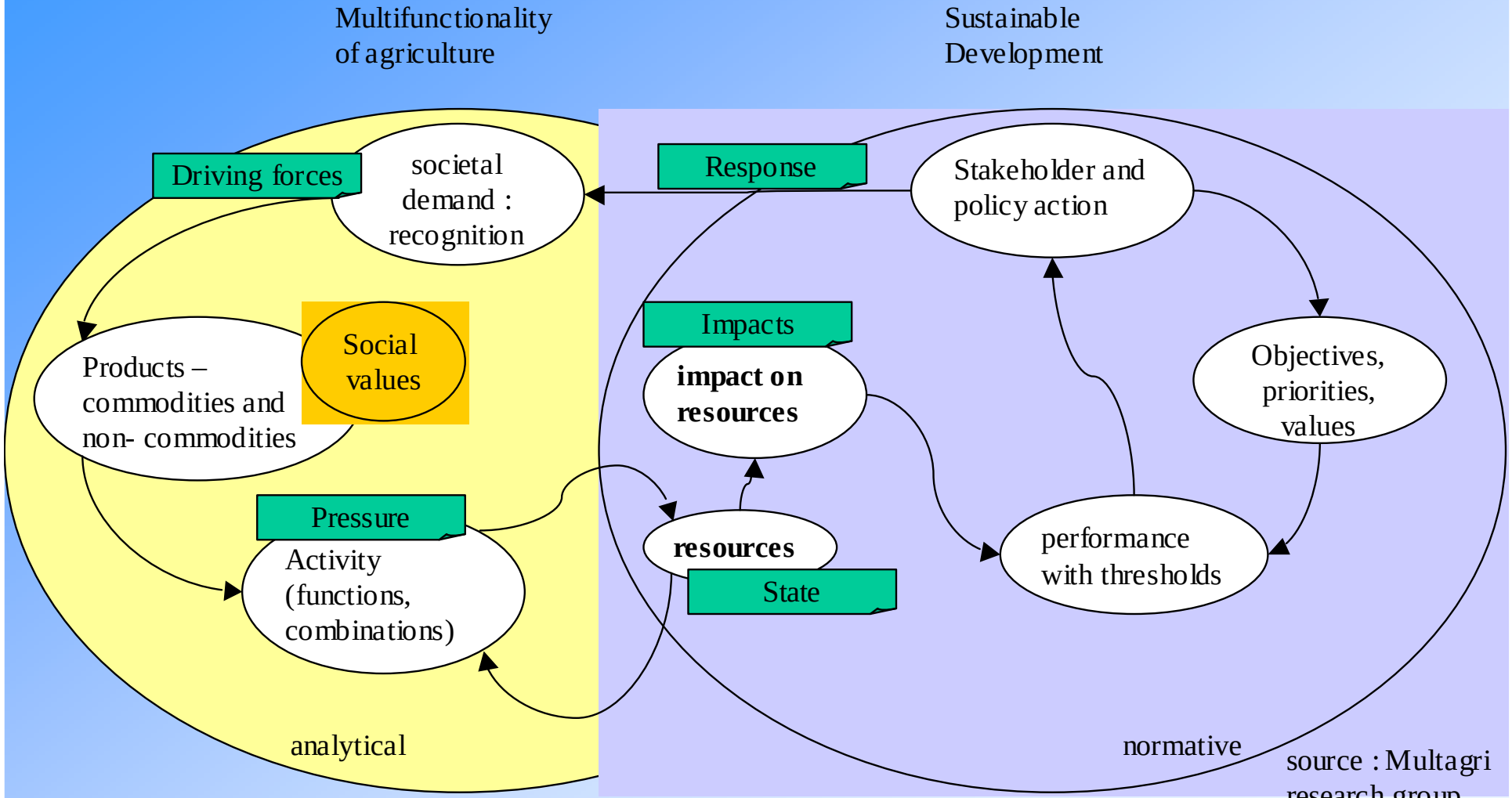
+ : positive effect, - : negative effect, +/-: depending on the situation the interlinkage may positive or negative

( ) : weak linkage, x: column no input to row, ?: uncertain/unknown effect

*: implying food production nationally as one of the means to provide food security

CC: relationship going from complementary to competing between the public goods in production

MF - SD


Multifunctionality of agriculture
Sustainable Development
Driving forces
societal demand : recognition
Response
Stakeholder and policy action
Products – commodities and non- commodities
Social values
Impacts
impact on resources
Objectives, priorities, values
Pressure
Activity (functions, combinations)
resources
State
performance with thresholds
analytical
normative
source : Multagri research group

3 Tools and models to explain and forecast MFA

Indicator systems - Examples

Existing indicators systems (a selection):

- Sustainability – related: e.g. the Dutch **People, Planet, Profit** approach
- Resource – related: e.g. the indicator set on **Landscape functions** (Bastian and Röder 2002)
- Agricultural production - related: e.g. the **Farm Accountancy Data Network** (FADN)

➢ **None is really sufficient** for the assessment and evaluation of MFA,

- ➢ Interrelations of functions not covered,
- ➢ Not well linked to agriculture.