VISIONS OF LAND USE TRANSITIONS IN EUROPE

Marion Bogers, Alterra Wageningen UR

VOLANTE

Coordination Meeting, DG Research & Innovation, Brussels, 23 October 2012

www.volante-project.eu

COOPERATION

VOLANTE
VISIONS OF LAND USE TRANSITIONS IN EUROPE

Collaborative Project (large scale integrating project) under the 7th Framework Programme of the European Commission's DG Research & Innovation

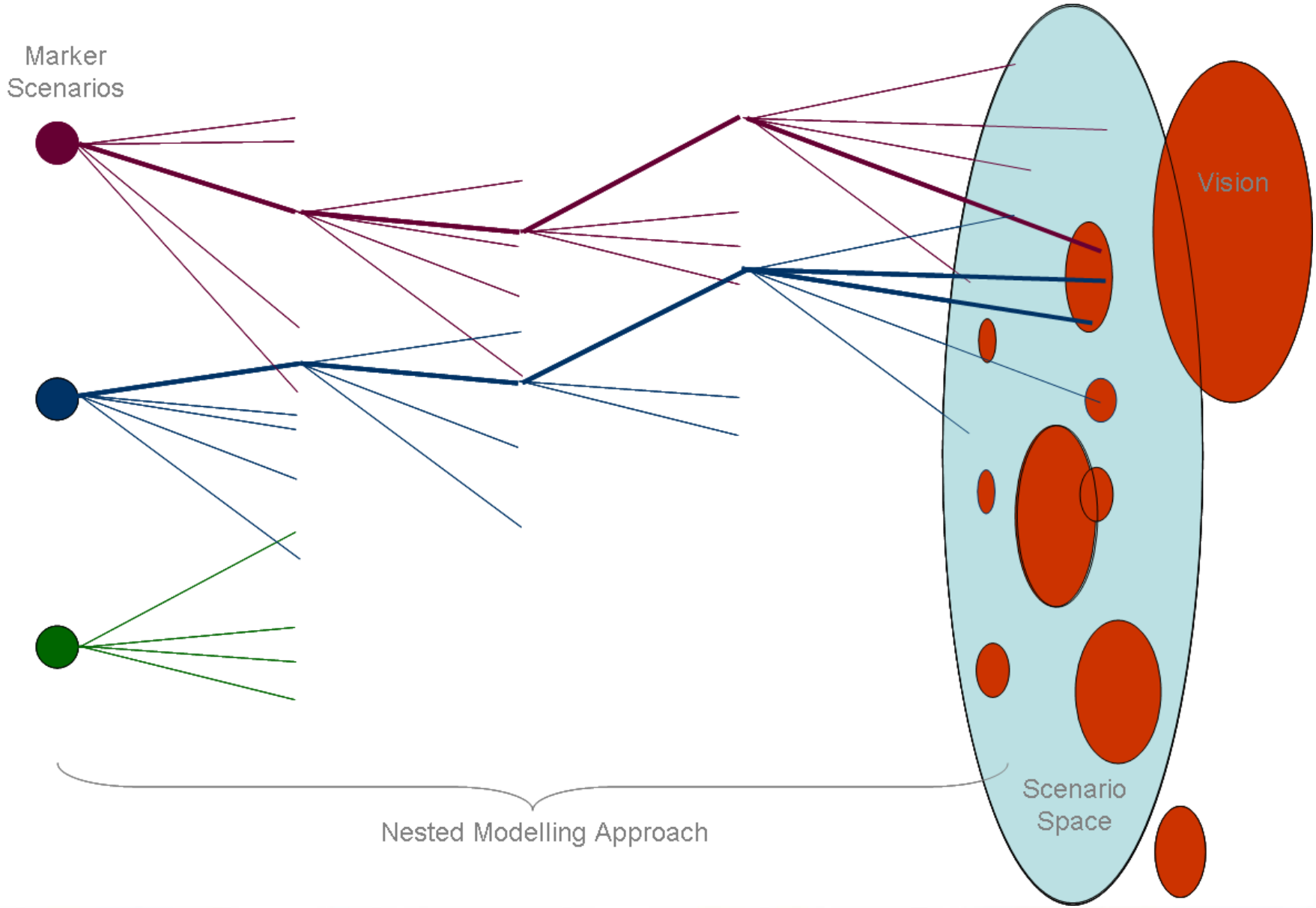
Running from 2010 – 2015; 14 partner institutions

Alterra	**Lead Partner – DLO Wageningen UR**	**The Netherlands**
UEDIN	Edinburgh University	**United Kingdom**
UNIKLU	Institute of Social Ecology	**Austria**
VUA	VU University Amsterdam	**The Netherlands**
PIK	Potsdam Institute for Climate Impact Research	**Germany**
UCPH	Copenhagen University	**Denmark**
EFI	European Forest Institute	**int.**
CNRS	CNRS Grenoble	**France**
Aegean	University of the Aegean	**Greece**
UNIBUC	Bucharest University	**Romania**
JRC	JRC-IES	**int.**
UBER	Humboldt University Berlin	**Germany**
NERI-AU	National Environmental Research Institute	**Denmark**
PROSPEX	PROSPEX bvba (SME)	**Belgium**

VOLANTE: Future oriented

Aiming to:

- Identify clear visions of European policy and land management
- Reduce the large variation in possible land use scenarios for the future to a manageable set
- Identify crucial points of no return both in history and in potential future
- Identify and evaluate policy options for the various landscapes of Europe and for shorter and longer term perspectives, to achieve desired futures
- Focus on a Roadmapping workshop where prominent decision makers and stakeholders interactively discuss the conclusions of this evaluation
- Result: Roadmap for Future Land Resources Management in Europe



Marion Bogers
and Bas Pedroli

Visions of Future Land Use Management in Europe

Coordination Meeting, DG Research & Innovation, Brussels, 2 October 2012

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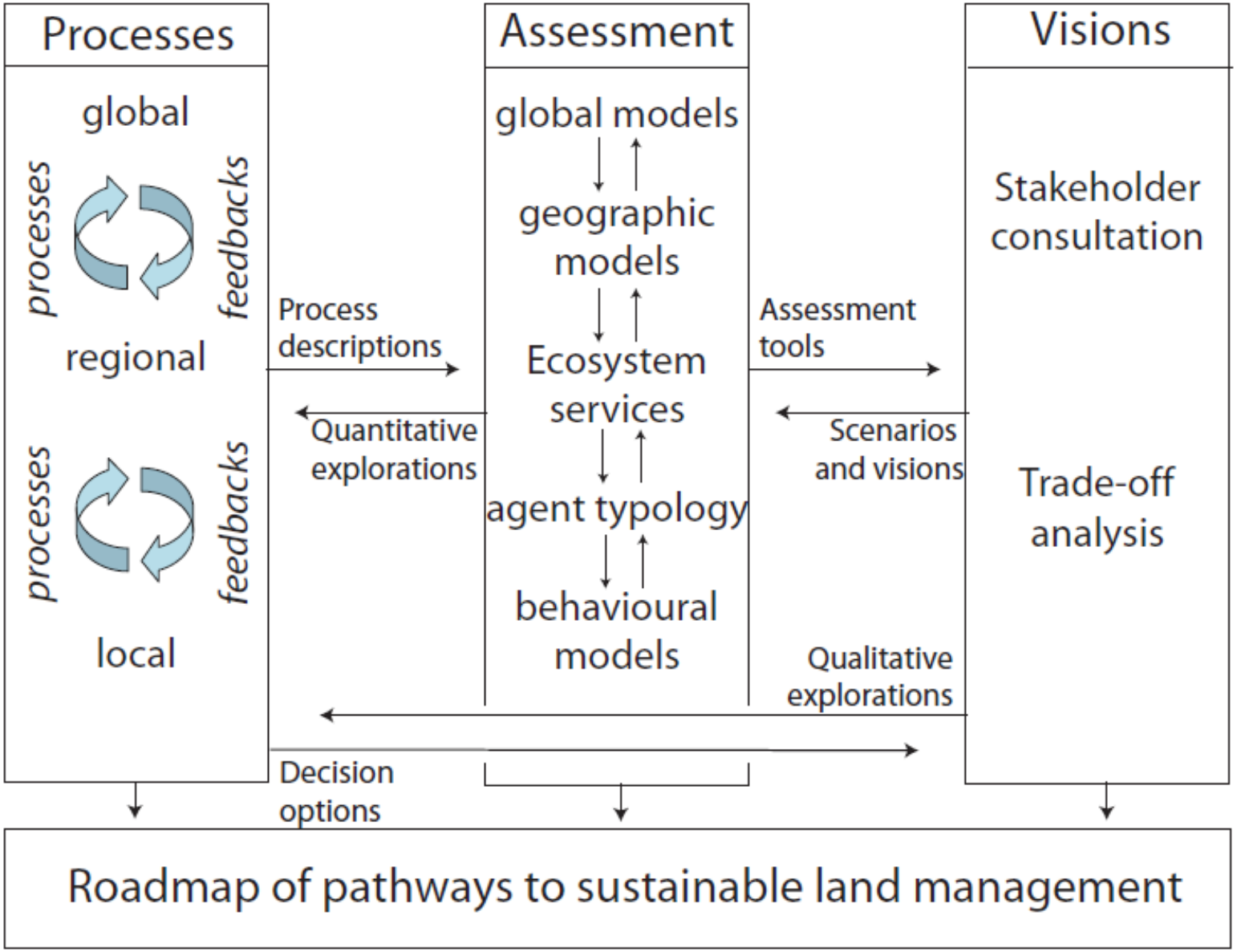
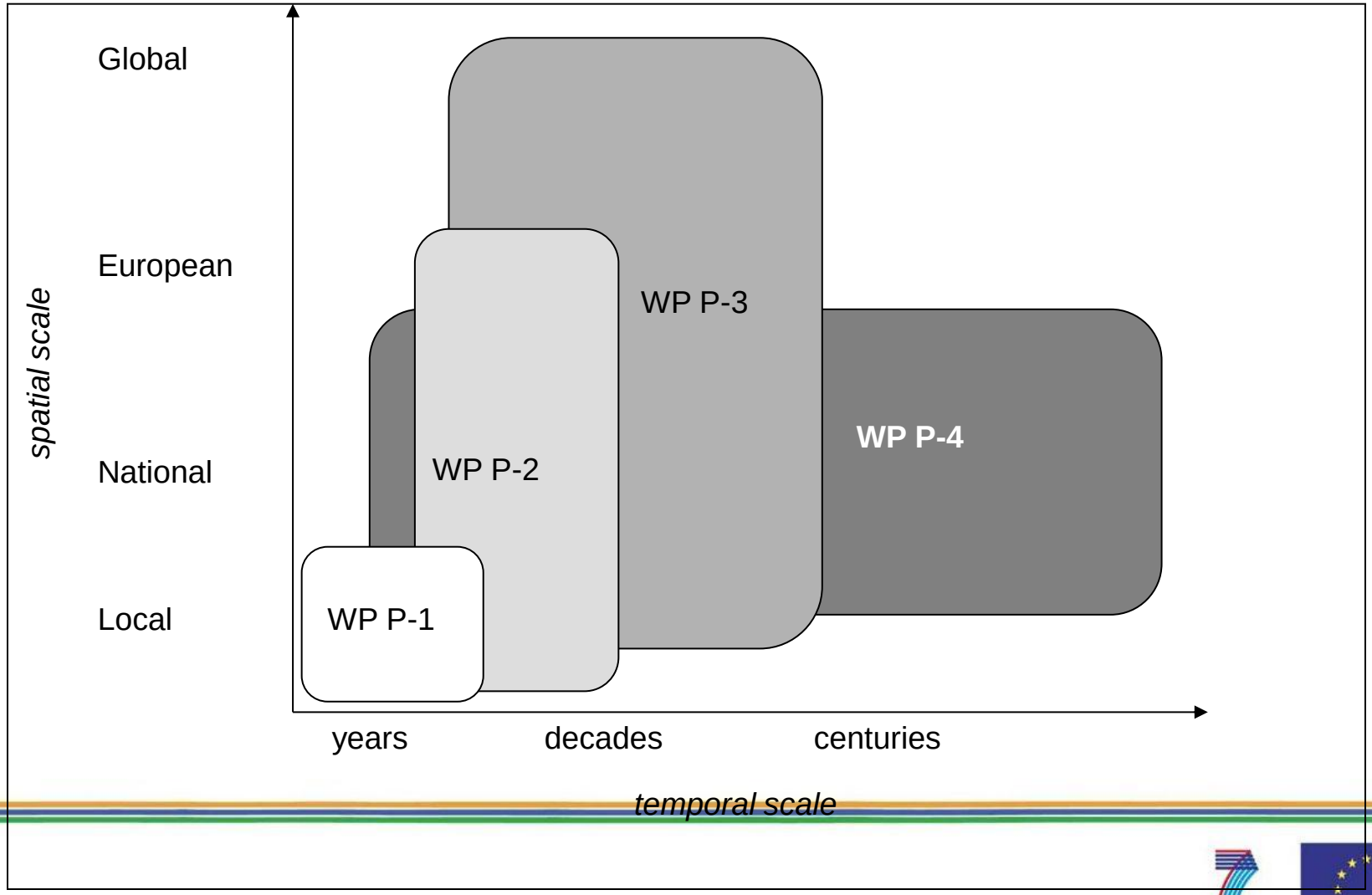
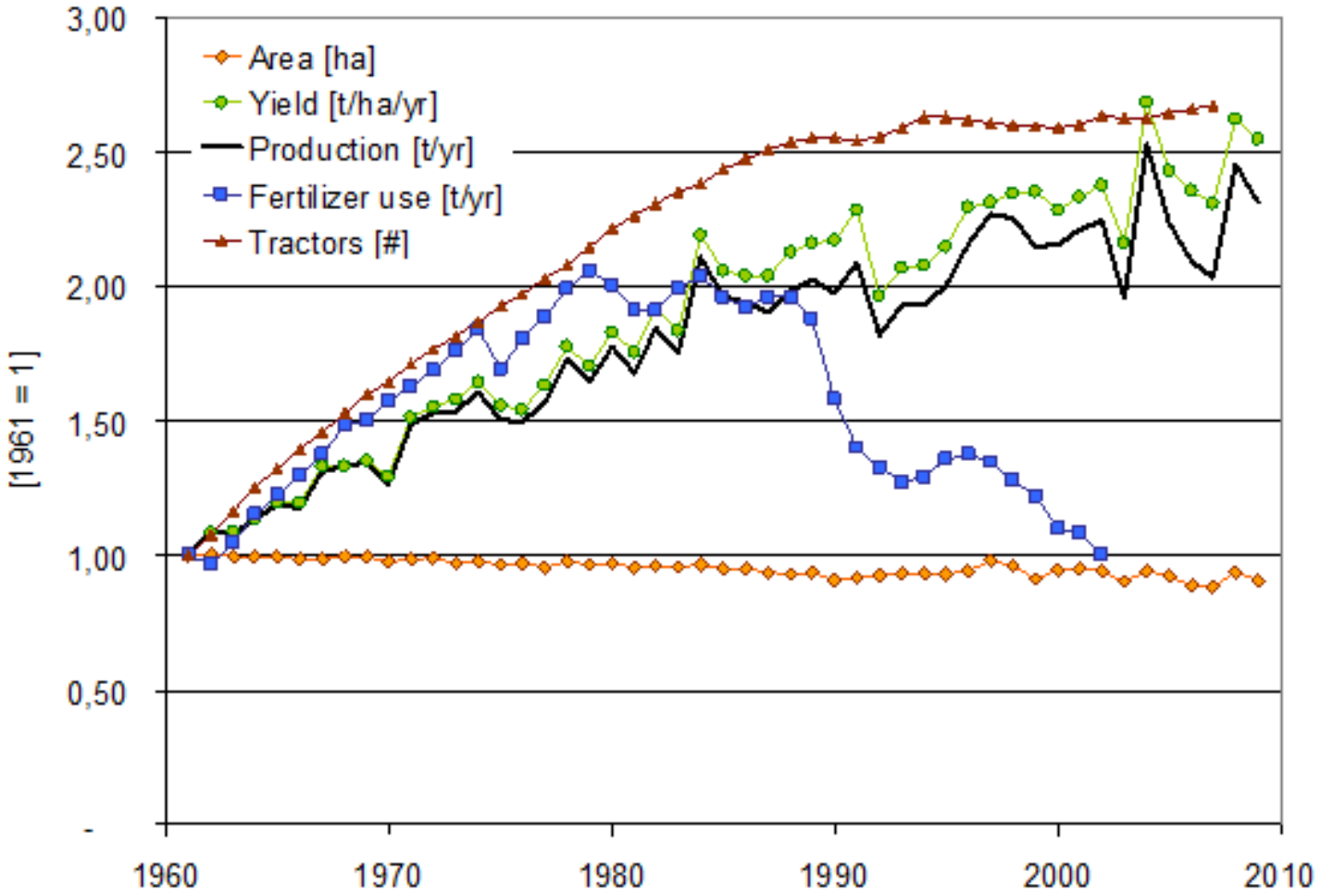

Processes
global
processes
feedbacks
regional
processes
feedbacks
local
Assessment
global models
geographic models
Ecosystem services
agent typology
behavioural models
Visions
Stakeholder consultation
Trade-off analysis
Process descriptions
Quantitative explorations
Assessment tools
Scenarios and visions
Qualitative explorations
Decision options
Roadmap of pathways to sustainable land management


Global
European
National
Local
spatial scale
WP P-3
WP P-2
WP P-4
WP P-1
years
decades
centuries
temporal scale

Processes: Focus on Land Use Intensity and Land Use Functions

Example : cereal production EU-27

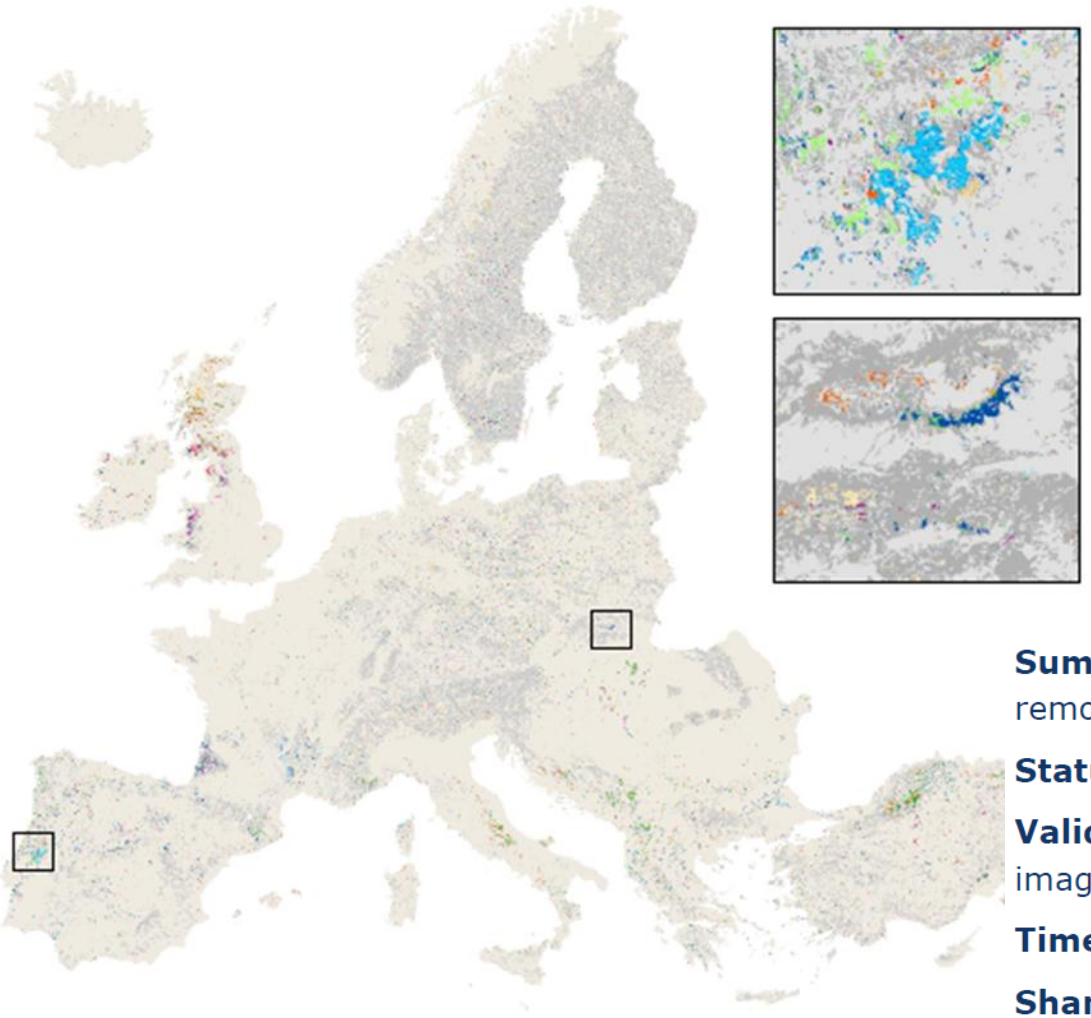


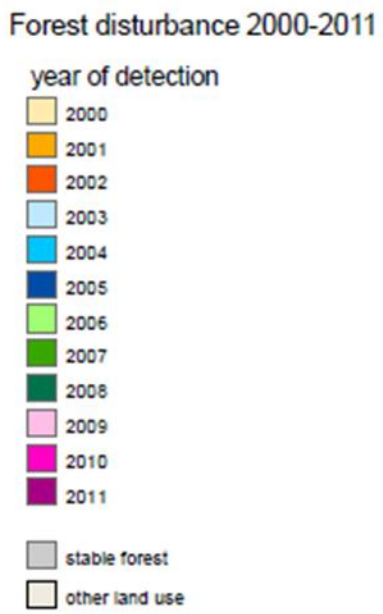
Rounsevell, Pedroli *et al*. (2011), *Land Use Policy* 29: 899-910

Indicators for Land use intensity

Forestry indicators	Agriculture indicators	Integrated indicators
1. Forest disturbance	6. Fertilizer application rates	13. Landscape elements
2. Change in growing stock	7. Irrigated vs rainfed cropland	14. Human Appropriated NPP
3. Natural disturbances	8. Cropping intensity	15. eHANPP
4. Forest management regimes	9. Field size	
5. Forest management intensity	10. Grazing intensity	
	11. Grassland management regimes	
	12. Abandonded farmland	

Forest disturbance





Summary: Maps forest disturbance (full canopy removal) based on MODIS time series 2000-2011

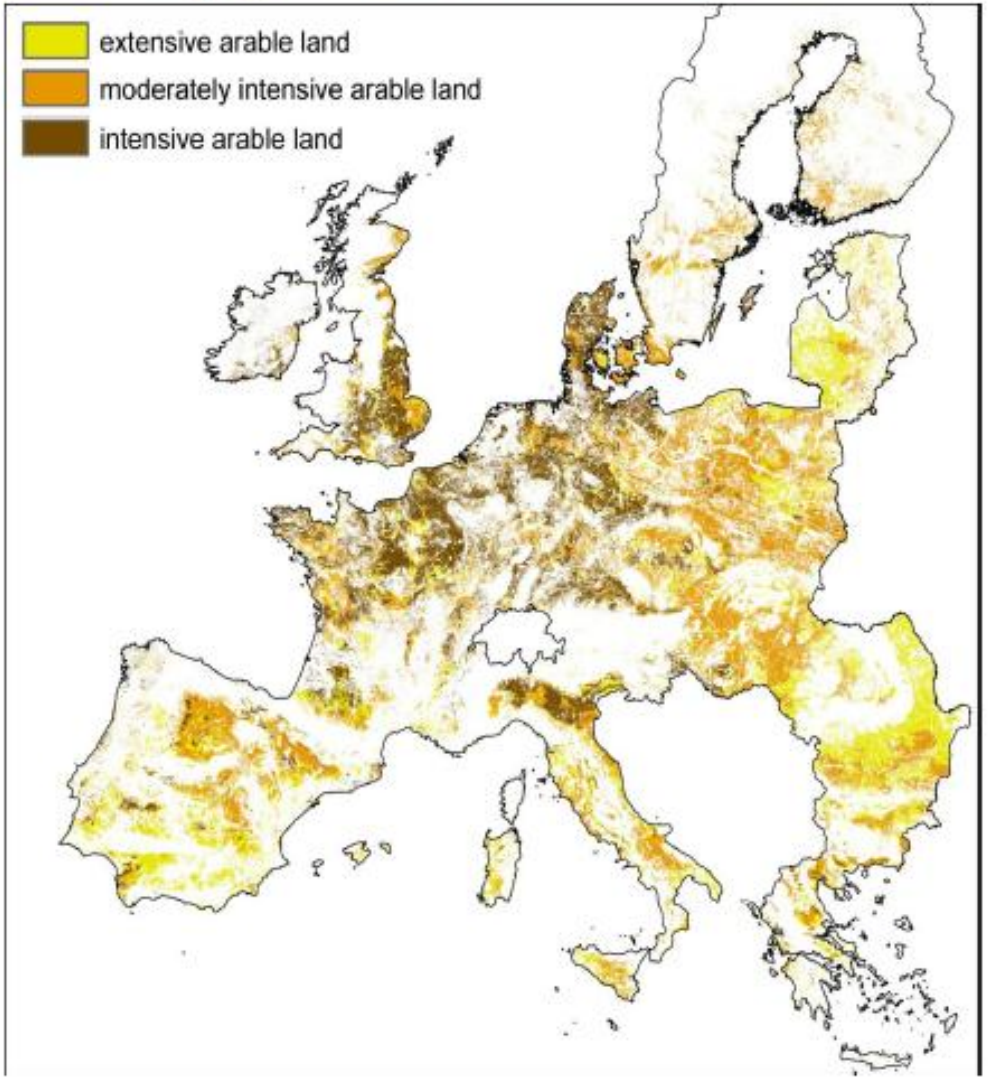
Status: finalized

Validation: based on high-resolution satellite images, in progress

Timeline: final product available 08/2012

Sharing policy: available to all VOLANTE partners and, once published, to the public

Fertilizer application rate



Summary: Developed and finished fertilizer application rate indicator, which proxies for agricultural management intensity by disaggregating nitrogen application rates.

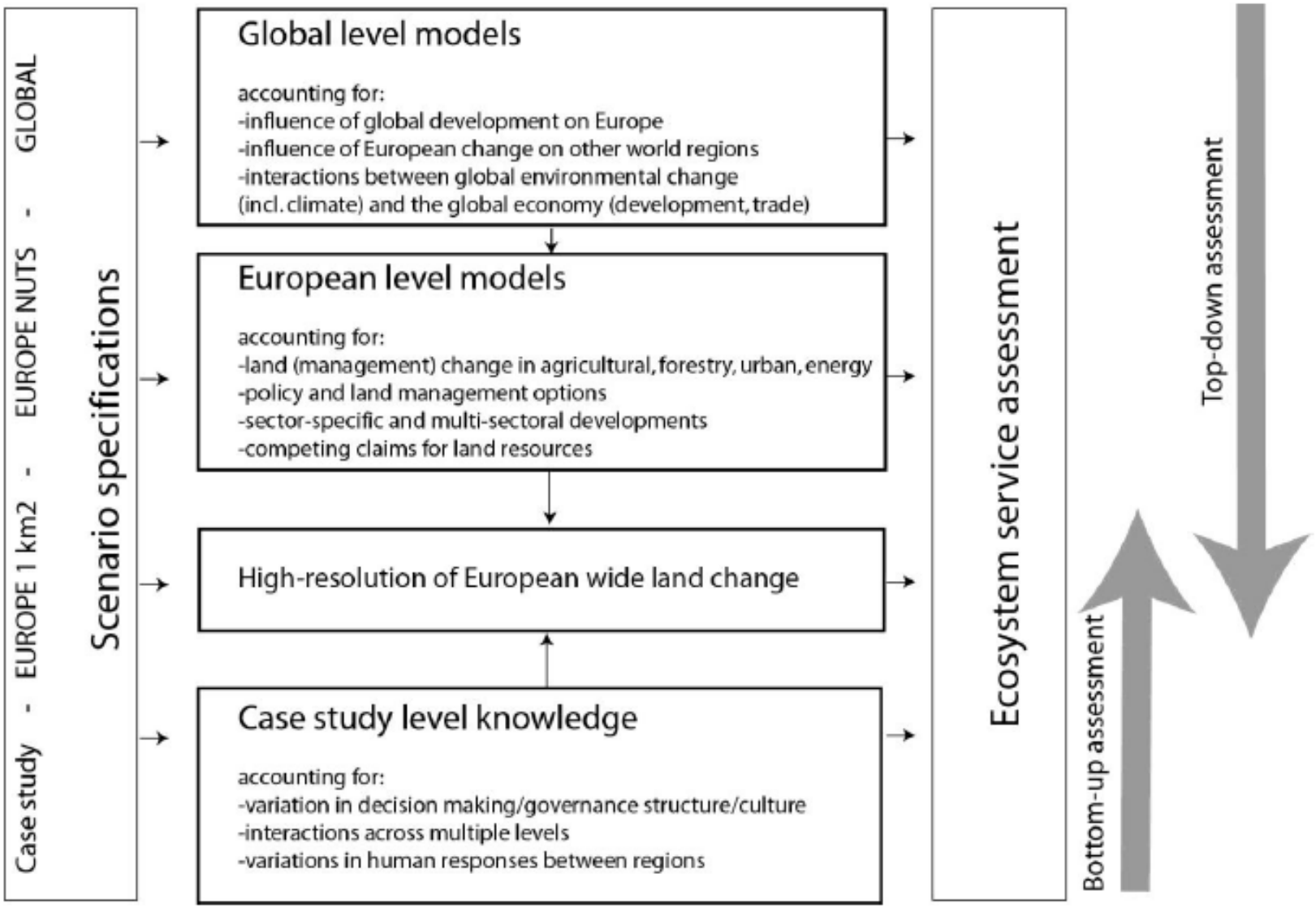
Status: Finished

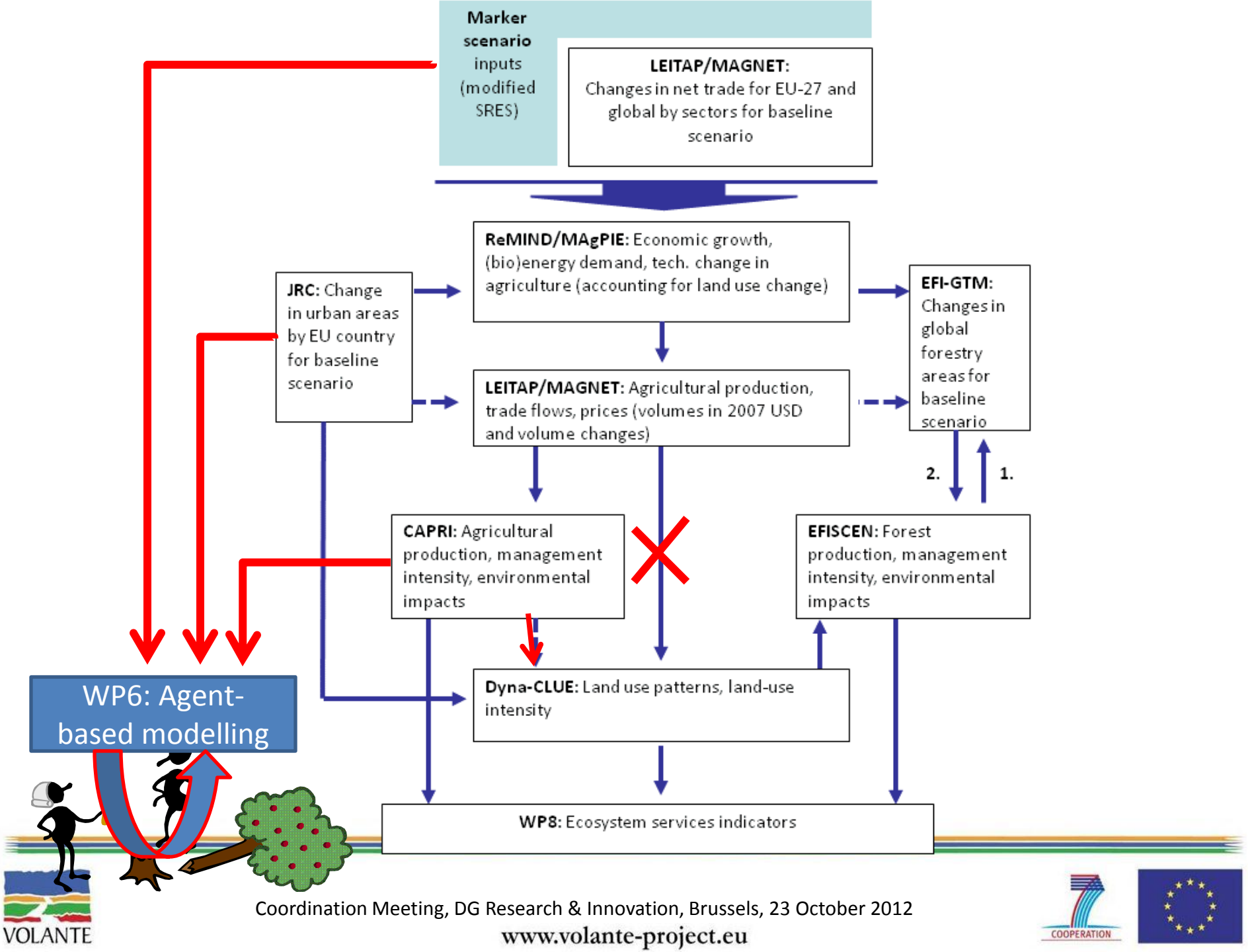
Validation: The intensity classes are tested by reviewing the data assignment to irrigated vs. non-irrigated areas (CORINE 2000).

Timeline: Finished

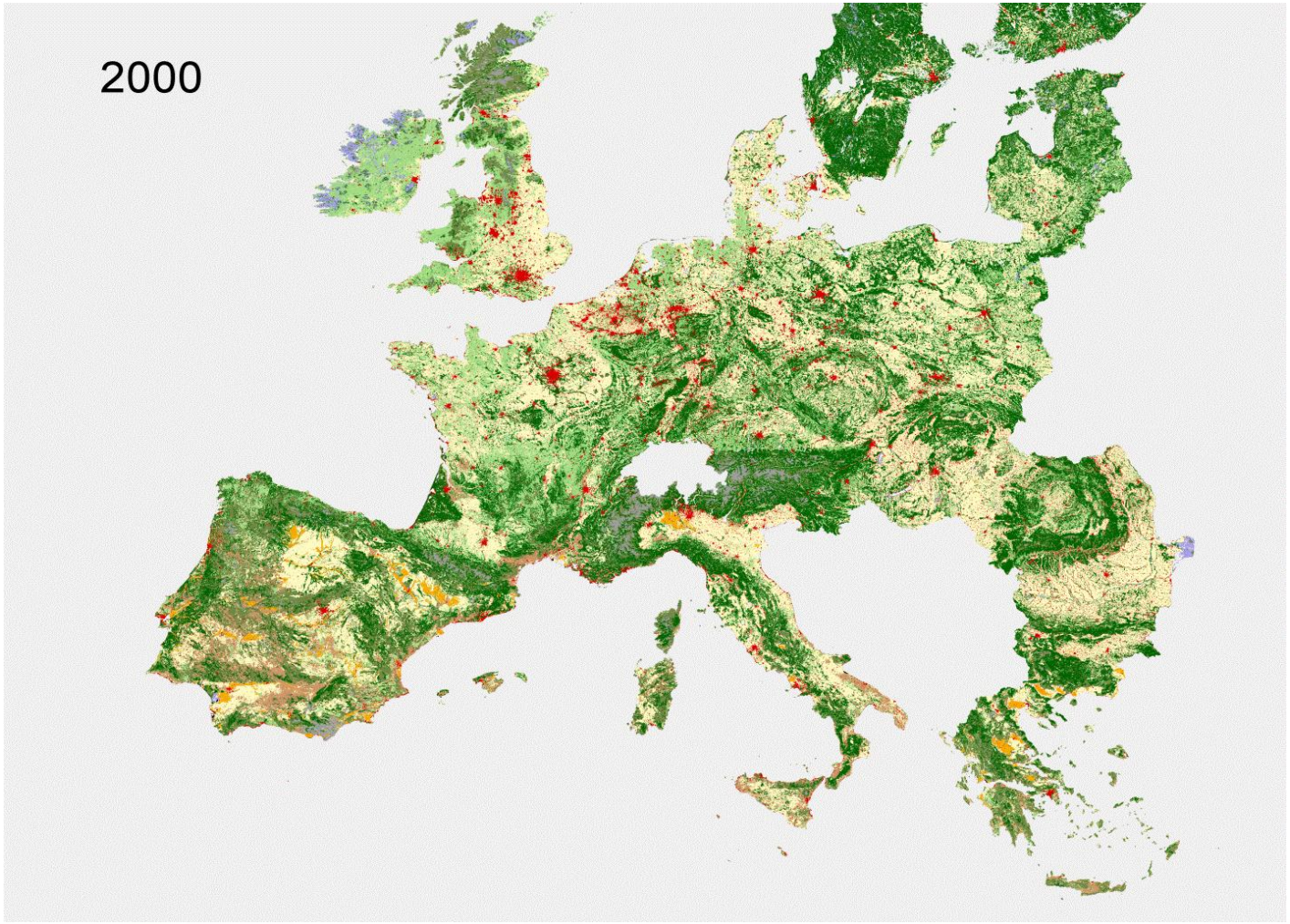
Sharing policy: Results are publicly available at www.ivm.vu.nl/ag-intensity

Assessment methods




Marker scenario inputs (modified SRES)
LEITAP/MAGNET: Changes in net trade for EU-27 and global by sectors for baseline scenario
ReMIND/MAgPIE: Economic growth, (bio)energy demand, tech. change in agriculture (accounting for land use change)
JRC: Change in urban areas by EU country for baseline scenario
EFI-GTM: Changes in global forestry areas for baseline scenario
LEITAP/MAGNET: Agricultural production, trade flows, prices (volumes in 2007 USD and volume changes)
2.
1.
CAPRI: Agricultural production, management intensity, environmental impacts
EFISCEN: Forest production, management intensity, environmental impacts
Dyna-CLUE: Land use patterns, land-use intensity
WP8: Ecosystem services indicators
WP6: Agent-based modelling

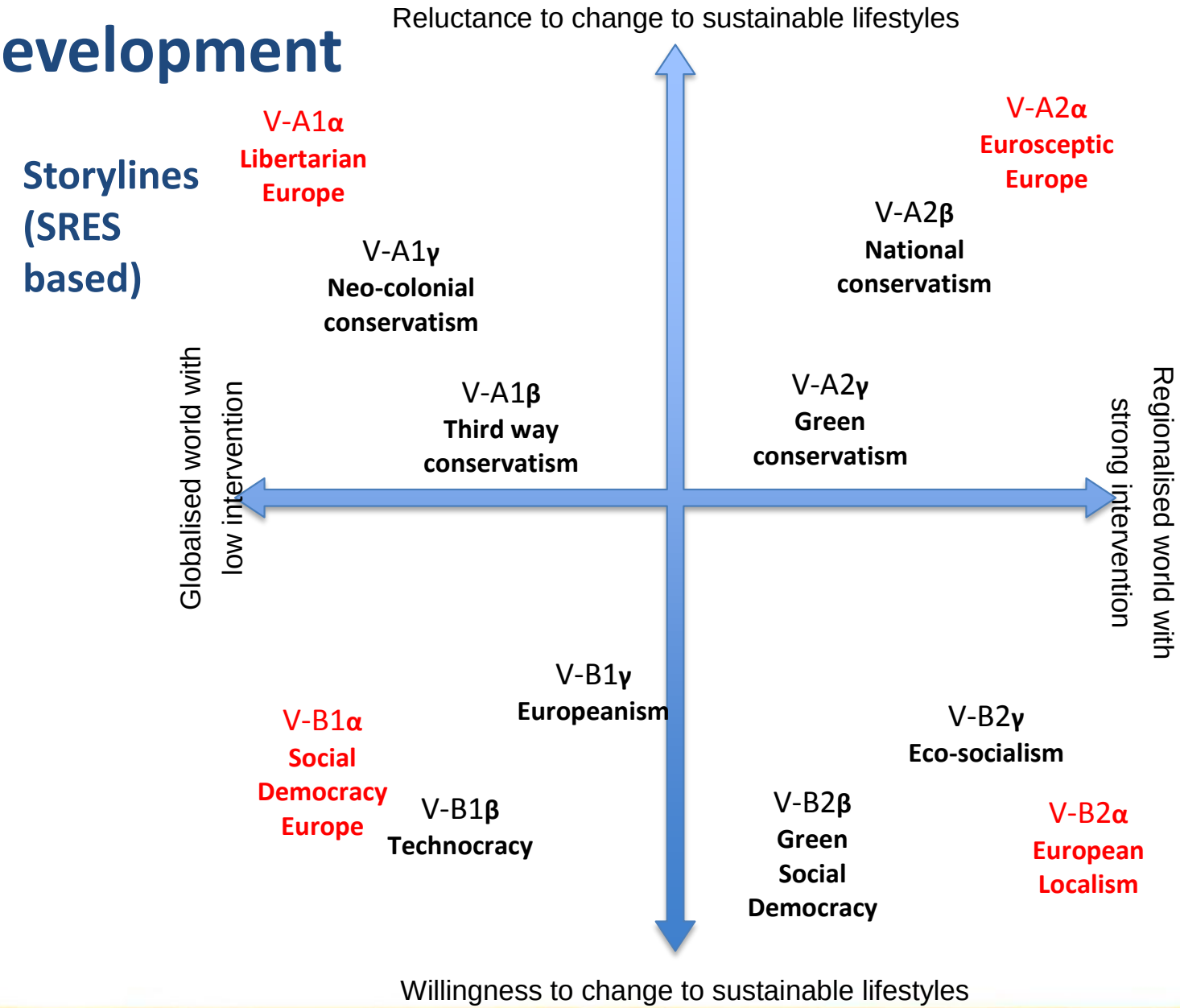
Example Assessment



Dyna-CLUE Resolution 1 km2: spatial patterns of land cover for yearly time steps, 18 different land cover types

Verburg & Overmars (2009), *Landscape Ecology,* 24(9), 1167-1181.

Scenario Development



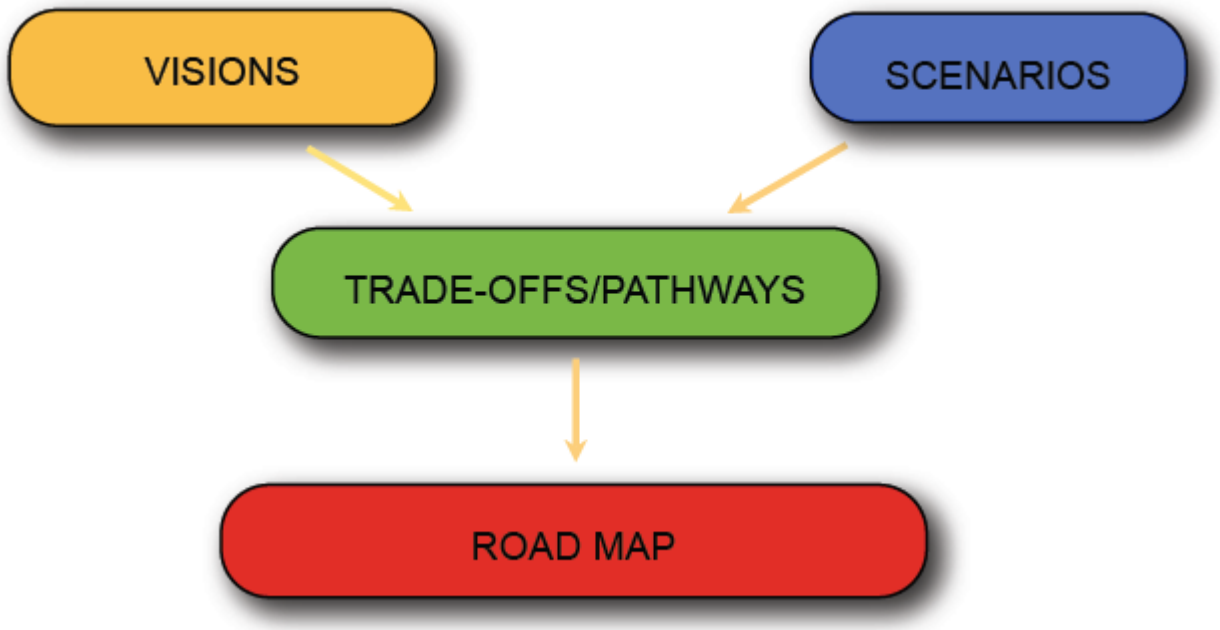
Visions

- **Roadmap towards desired land use future for Europe in 2040**
  - provide a synthesis of the project as a meaningful set of recommendations
  - be presented and refined in high profile workshop
  - be about conveying a narrative of possible choices (and their consequences), supported by numbers / maps / graphs

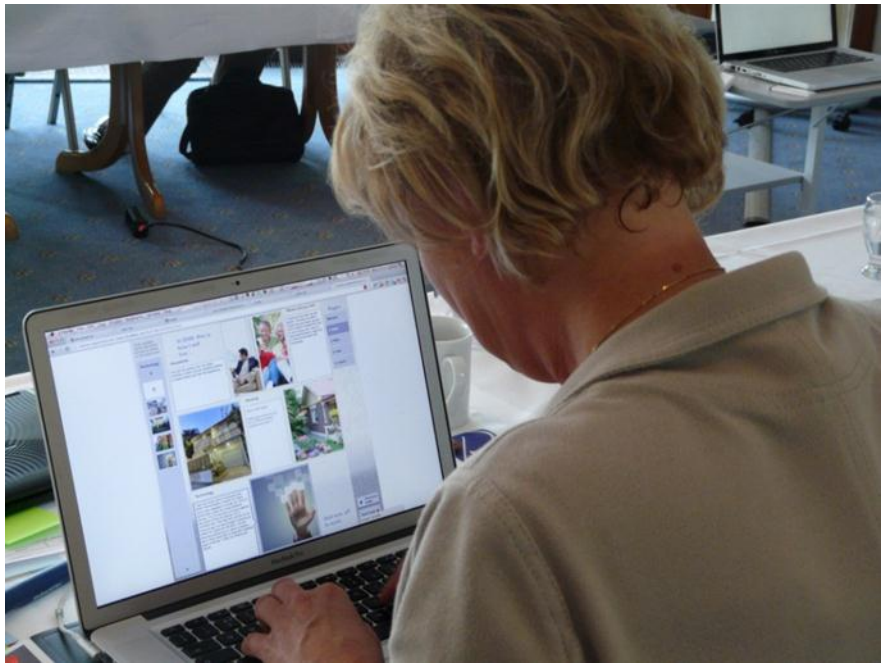
A typology of land use futures (adapted after McDowall & Eames 2006)

Descriptive *"what if?"*	**Forecasts** use formal quantitative extrapolation and modelling to predict likely futures from current trends. **Exploratory scenarios** explore possible futures. They emphasise drivers, and do not specify a predetermined desirable end state towards which storylines must progress. **Technical scenarios** explore possible future technological changes in land use systems, incl. e.g. 2nd generation biofuel crops, high precision agriculture, or large scale meat production in agroparks. They emphasise the technical feasibility and implications of different options, rather than explore how different futures might unfold.
Normative *"where to arrive?"*	**Visions** are elaborations of a desirable and (more or less) plausible future. They emphasise the benefits of a specific land use future rather than the pathways through which it might be achieved. **Backcasts and pathways** start with a predetermined 'end' point—a desirable and plausible future. They then investigate possible pathways to that point. **Roadmaps** describe a sequence of measures (policy options) designed to bring about a desirable future. Specific measures are defined on the basis of evaluation of scenarios, visions and pathway exercises. Roadmaps and similar foresight methods are used to cope with uncertainty in areas with long planning horizons

VOLANTE process towards roadmaps



The Visions Workshops



4 Visions Workshops in 2012

- Primary production (agriculture, bioenergy and forestry)
- Nature, recreation and leisure
- Urban settlements and transport infrastructure
- Energy and water

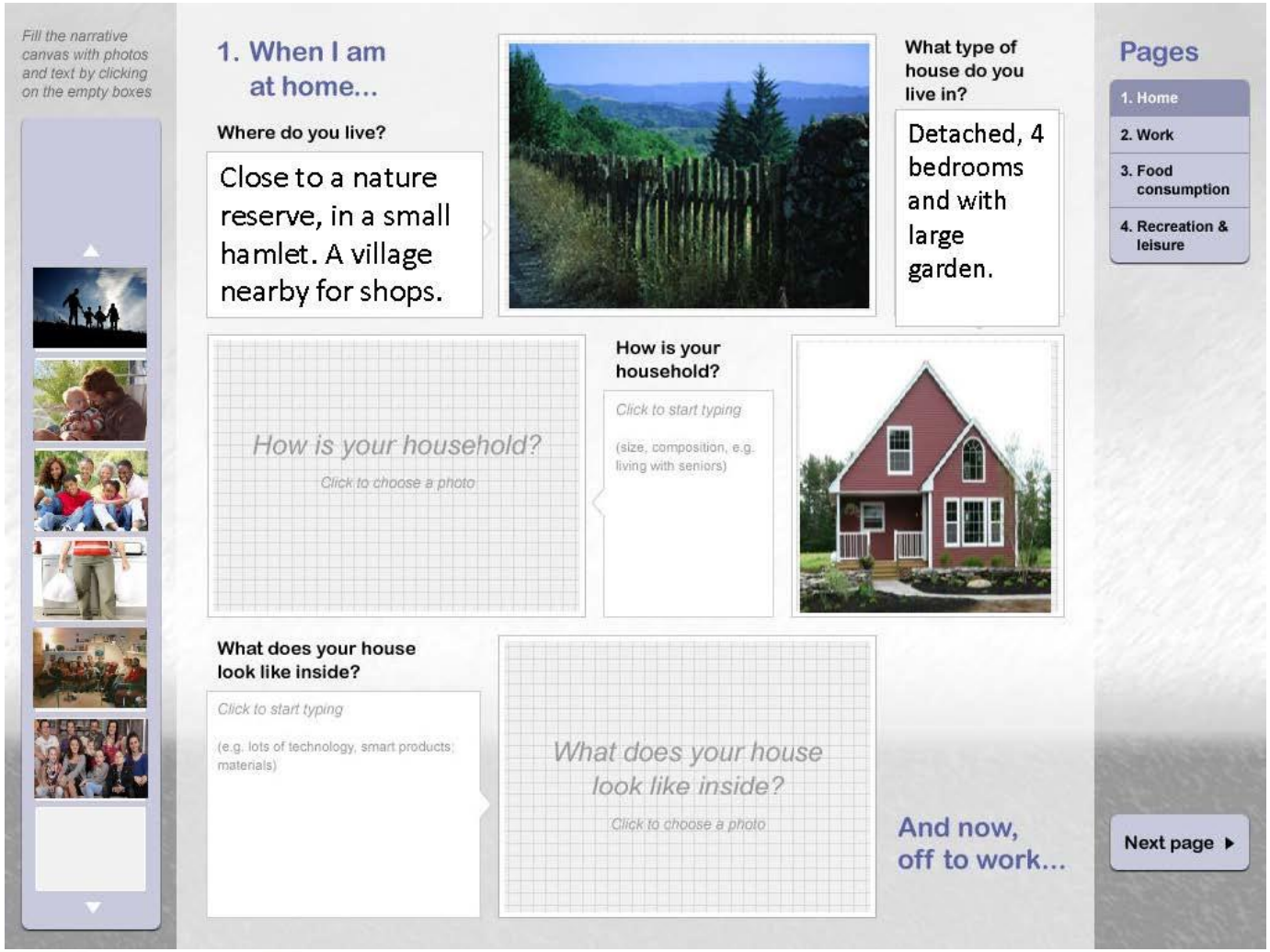
Approx. 20 stakeholders in each workshop: domain experts (ngo's, private companies, governmental, research institutes; different European regions)

Two days, using a number of techniques, mostly working in small groups.

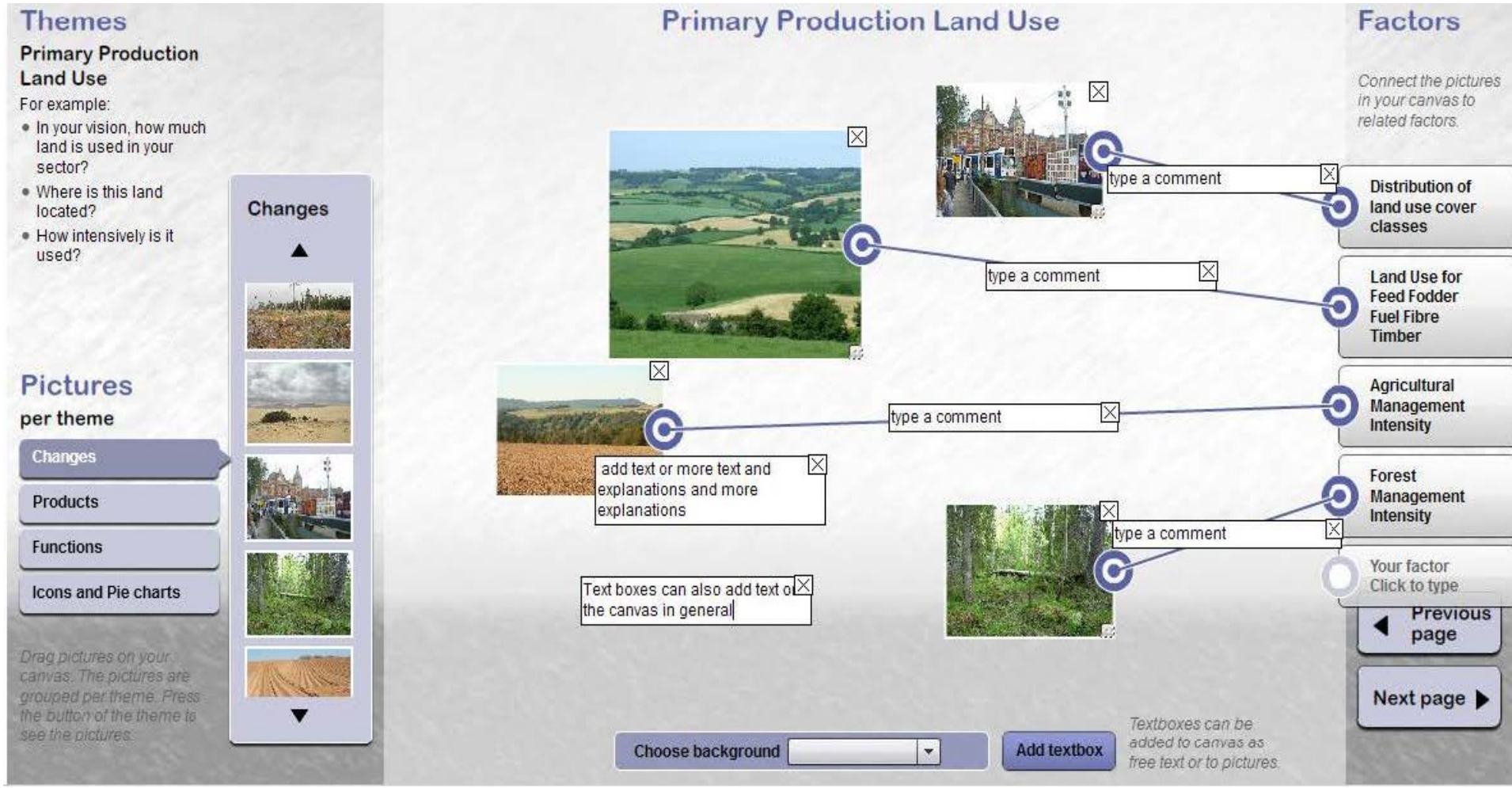
Result of each workshop: 3-5 visions on land use in Europe in 2040

The visions are *desired futures,* so what the stakeholders *want* for the future.

Example of a result



Example of a result

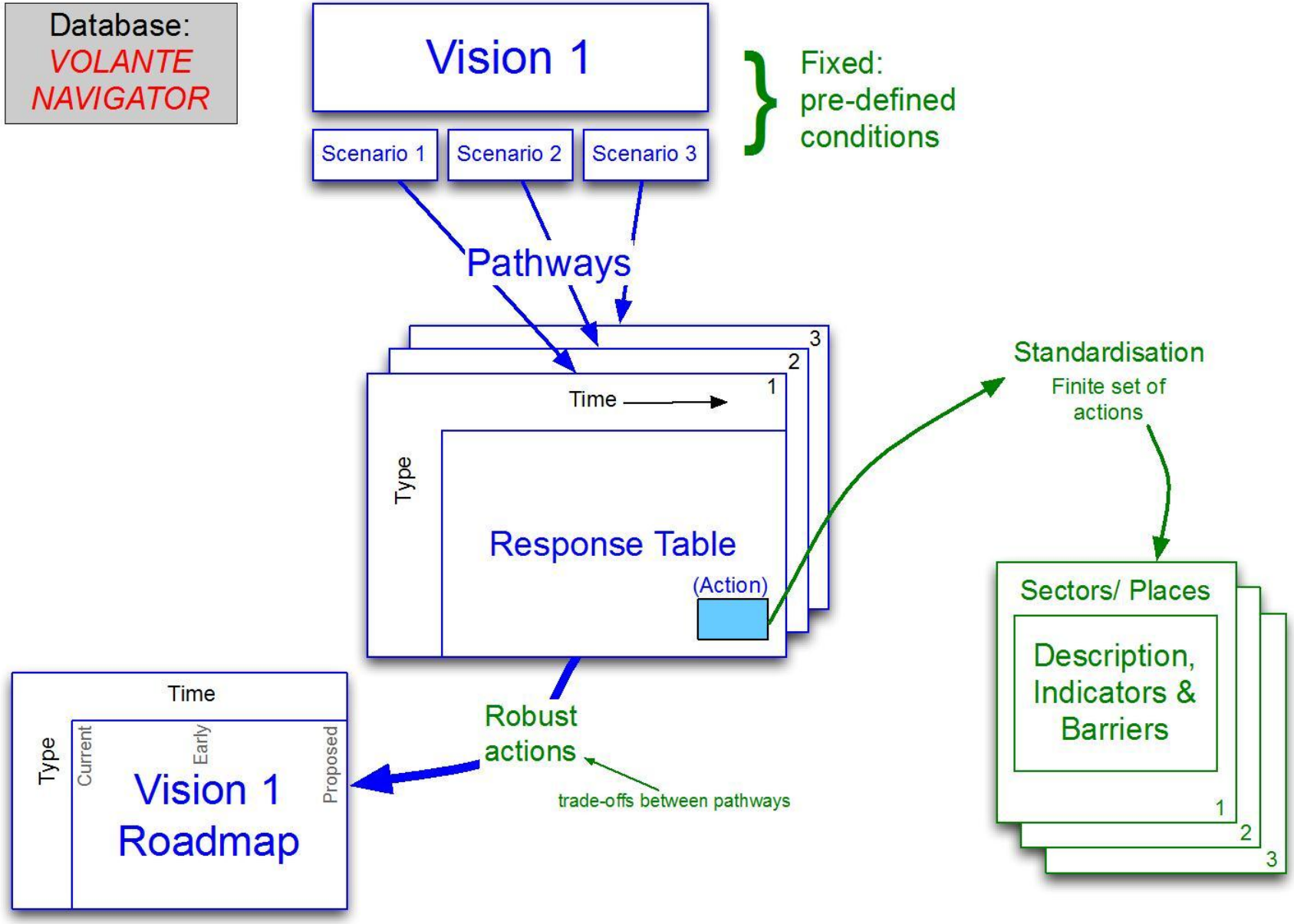


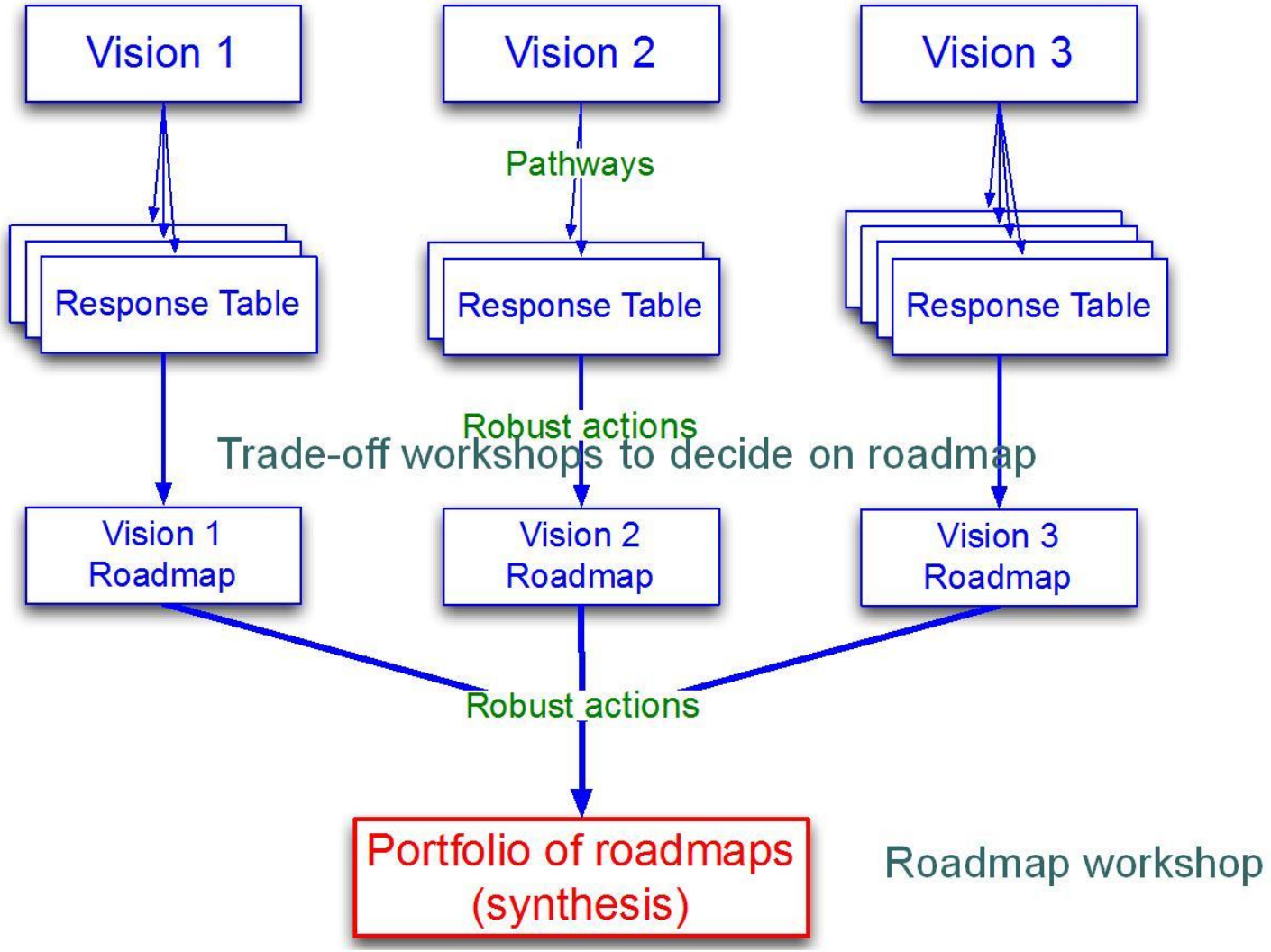
One of the final visions

- Density as opposed to urban sprawl, so using space efficiently (e.g. vertical living, using brownfields)
- Polycentric development of medium sized cities, growth limited by green belts: urban sprawl would increase travel and make transport inefficient
- Social contacts and services of general interest are near
- Well planned infrastructures; intra-urban, inter-urban and interregional

aims of the Roadmapping Process

- Produce outcomes that are
  a) relevant for decision-makers needs and use (*saliency*);
  b) *credible* as being the result of the application of adequate scientific methodological and empirical work; and, finally,
  c) *legitimate,* since they are incorporating divergent values in a non-biased context.
- Provide **optimal synthesis** and integration of project results and provide the basis for knowledge transfer from VOLANTE to the identified stakeholder groups
- Decide on **recommended pathways** for land use development
- Create a **Roadmap for Future Land Resource Management**, as a meaningful set of recommendations, supported by relevant high level policy, NGO and private sector stakeholder groups
- Identify obstacles, critical factors and implementation recommendations for the Roadmap
- Produce and publish a **high-impact Science-Policy Briefing** on the outcomes of the Roadmapping process, including a post-VOLANTE implementation plan


Database:
VOLANTE
NAVIGATOR
Vision 1
Fixed:
pre-defined
conditions
Scenario 1
Scenario 2
Scenario 3
Pathways
3
2
1
Time
Type
Response Table
(Action)
Standardisation
Finite set of
actions
Sectors/ Places
Description,
Indicators &
Barriers
1
2
3
Robust
actions
trade-offs between pathways
Time
Type
Current
Early
Proposed
Vision 1
Roadmap


Vision 1
Vision 2
Vision 3
Pathways
Response Table
Response Table
Response Table
Robust actions
Trade-off workshops to decide on roadmap
Vision 1 Roadmap
Vision 2 Roadmap
Vision 3 Roadmap
Robust actions
Portfolio of roadmaps (synthesis)
Roadmap workshop

VOLANTE

Towards a new European landscape management paradigm for the future !

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