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Main Authors: Marion Bogers, Bas Pedrol, Hermann Lotze-Campen, Søren Kristensen, Marc Metzger
Reviewers: Mark Rounsevell, Peter Verburg
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Introduction

The first task in VOLANTE is to develop a coherent Research Implementation Plan. The VOLANTE Research Implementation Plan (VRIP) specifies the timing and defines in detail the content of the deliverables, and identifies the individual researchers responsible for these. The VRIP is based on the flows of information and data and the interactions between the Work Packages and the proper timing of delivery to allow all aspects of the work plan to be executed properly and timely. An overview of the planned actions in time is outlined in Annex 1. The VRIP also defines the VOLANTE case study approach (for the case studies employed in WP1, WP2, WP4, WP6, and possible WP11), the boundary conditions for visions and scenarios, the strategy for up- and downscaling (here WP5 and 7 are mostly involved). The VRIP will be updated regularly and is accessible to all partners through the VOLANTE intranet.
1. Detailed planning of the deliverables

D1.1 Report on meta study of existing empirical data available to VOLANTE
- Due M7
- General decisions: a preliminary report was compiled for VOLANTE kick-off meeting, Dec. 2010. It needs further inputs and details on some aspects.
- First responsible: Søren Kristensen, Co-authors: Theano Terkenli, UNI-KLU, UNIBUC
- Reviewer(s): Alterra – Theo van der Sluis.
- Input – output (links to other WPs): The report is relevant for all WP’s dealing with empirical data (eg. P-2, P-4, A-5, A-7, V-10, V-13).
- Risks: Additional information not provided.
- Actions:
  - Alterra to supply information on additional case studies before UCPH meeting (02.02.11).
  - A first draft of report to be circulated for comments to all WP1 partners in March 2011 (deadline for comments: 01.04.11).

D1.2 Summary reports for each case study including additional data
- Due M16
- General decisions: Reports will be produced following field work in autumn 2010.
- First responsible: Søren Kristensen, Co-authors Individual WP1 partners
- Reviewer(s): Theo van der Sluis.
- Input – output (links to other WPs): The report is relevant for all WP’s dealing with empirical data (eg. P-2, P-4, A-5, A-7, V-10, V-13).
- Risks: Field work not completed on time.
- Actions: During Q1+Q2, 2011 case study design and data requirements will be determined by WP1 partners (milestones: CPH meeting 02.02.11 and WP1 workshop June 2011). Summary reports to be ready February 2012.

D1.3 Draft report: analysing combined results from case studies
- Due M24
- General decisions: Report will be compiled by May 2012 based on individual reports by case study responsible WP1 partners. It will be attempted to design report as a short report with most of the data as an attached scientific paper.
- First responsible: Søren Kristensen, Co-authors - Reviewer(s): Theano Terkenli, UNI-KLU, UNI-BUC, Alterra – Theo van der Sluis.
- Input – output (links to other WPs): The report is relevant for all WP’s dealing with empirical data (eg. P-2, P-4, A-5, A-7, V-10, V-13).
- Risks: Individual reports on case studies not completed on time.
- Actions: case study partners submit reports by February 2012.

D1.4 Synthesis report: Up-scaling results and cross-region comparisons
- Due M34
• General decisions: Report will be compiled by June 2013 based on comments to draft report from WP1 partners and other relevant actors during Q1+Q2 2013. It will be attempted to design report as a short report with most of the data as an attached scientific paper.

• First responsible: Søren Kristensen, Co-authors: Theano Terkenli, UNI-KLU, UNI-BUC, Reviewer(s): Alterra – Theo van der Sluis

• Input – output (links to other WPs): The report is relevant for all WP’s dealing with empirical data (eg. P-2, P-4, A-5, A-7, V-10, V-13) and will be discussed/prepared in collaboration with local/national experts.

• Risks: Delay in feedback from WP1 partners and other relevant actors.

• Actions: 1) UCPH prepares draft report February 2013. WP1 partners provide feedback by March 2013. Other relevant partners provide feedback by April 2013. Report presented at WP1 workshop May 2013.

D2.1: Overview of institutions and governance structures at various levels

• Due M24 (aim M6 June 2011)

• Focus: collect scientific evidence in specific cases of land use change caused by EU (and national/regional) policies, including an assessment of the various drivers of change. Literature study.

• First responsible: Theo van der Sluis

• Co-authors: UCPH, UNIBUC, Aegean, NERI-AU,

• Reviewer(s): Prof. B. Arts (Wageningen University)

• Input: literature review; results of WP-1, output (links to other WPs): D2.3, WP-3, WP-6, WP-7, WP-11, WP-13

• Risks:
  - No equal representation in literature of all EU-regions
  - Too large variation in policy implementation for rational comparisons
  - Local culture being a dominant factor, insufficiently assessed in literature

• Actions:
  - A short overview is prepared by the partners of published national case studies for all countries involved (June 2011, Søren Kristensen, Pia Frederiksen, Georgia Cosor, Theano Terkenli, Theo van der Sluis).
  - Preliminary identification of hot spots of land transition on the basis of literature (link with WP-3), based on this a selection is made of cases to be analysed in more detail (2011 Q2). These sample cases are selected on the basis of availability of data, geographical representation and diversity in policy domains (June 2011, Theo van der Sluis).
  - Data and literature collection: policy documents, articles in journals as well as grey literature will be assessed for the selected countries and regions. For those cases is analysed how the past 40 years institutions and land systems have changed at the national level, identifying the actors and their interactions (within/across organisational levels and policy domains (re WP P-3). Interpretation of the data (September 2011, Søren Kristensen, Pia Frederiksen, Georgia Cosor, Theano Terkenli, Theo van der Sluis).
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- Scientific papers are prepared for a special issue of a journal; articles for different countries are prepared. Overarching article, where a clustering is made of countries and regions with similar governance systems, which can later be used for an interpretation of land use change; conclusions (June 2012, Søren Kristensen, Pia Frederiksen, Georgia Cosor, Theano Terkenli, Theo van der Sluis)
- Content analysis is planned, based on the policy documents for the respective countries (Alterra, June 2012)

D2.2 Report on land system policies, trends and the importance of institutional agreements
- Due M32
  Focus: Historical analysis of main EU policies and conventions that influence land use
- First responsible: Pia Frederiksen (NERI-Arhus University)
- Co-authors: UCPH Alterra-LEI,
- Reviewer: Helmut Haberl
- Input: D2.1, output (links to other WPs): D2.3, WP-3, WP-6, WP-7, WP-11, WP-13
- Risks: Short institutional memory, insufficient data
- Actions:
  - Questionnaire is prepared with detailed questions on land use change and policies (June 2011, Pia Frederiksen, Theo van der Sluis)
  - Interviews with stakeholders, like local decision makers, politicians farmers and other land users (March – September 2011, Søren Kristensen, Pia Frederiksen, Georgia Cosor, Theano Terkenli, Theo van der Sluis).
  - National report is produced by each country on the results for each country or region which is assessed (September 2011, Søren Kristensen, Pia Frederiksen, Georgia Cosor, Theano Terkenli, Theo van der Sluis).
  - The country reports are compiled, and a comparison is made of the data (Pia Frederiksen, December 2011)
  - Articles are prepared for all regions (June 2012, Søren Kristensen, Pia Frederiksen, Georgia Cosor, Theano Terkenli, Theo van der Sluis).

D2.3 High impact publication on effects of EU-policies on land use change
- Focus: Impact of European policy (focus on EU 15) on land use and landscape character
- Due M36
- First responsible Theo van der Sluis (Alterra). This work would support a PhD study.
- Co-authors: NERI-AU, UCPH,
- Reviewer(s): Prof. B. Arts (Wageningen University)
- Method: case study work: time series of land use patterns and landscape change. Fixed intervals are Used for all case studies (e.g. 1980, 1990, 2000 and 2010) field check of landscape and biodiversity for case study areas identification of policies having affected land use transitions analyse driving factors for the land use transitions
- Input: WP-1, D2.1, D2.2, WP-3 (hotspots) - output (links to other WPs), WP-3 (land use transitions) WP-4 (long-term system dynamics), WP-8 (assessing ecosystem services), WP-11, WP-13  Paper in journal; Title: Drivers of Landscape Change: how EU policies affect the European Landscape (Journal: Land Use Policy)
- Risks:
- Insufficient data on physical land use changes
- No clear cause-effect relationships to be identified
- Data too fragmented in space and time
- Delays in WP-1 and WP-3

**Actions:**
- Digital topographical maps for different decades are prepared and if possible aerial photographs for case study areas (WP 2.1) (June 2011, Søren Kristensen, Pia Frederiksen, Georgia Cosor, Theano Terkenli, Theo van der Sluis).
- Available biodiversity data and landscape data is provided (June 2011, Søren Kristensen, Pia Frederiksen, Georgia Cosor, Theano Terkenli, Theo van der Sluis).
- A spatial and temporal analysis of landscape pattern is made (March 2012, Theo van der Sluis)
- Scientific paper prepared on cause-effect relationships land use change (December 2012, Søren Kristensen, Pia Frederiksen, Georgia Cosor, Theano Terkenli, Theo van der Sluis).

**D2.4: Recommendations for relevant policies being developed for EU-27**

- Due M36
- First responsible Theo van der Sluis
- Co-authors: UNIBUC, Aegean, NERI-AU, Anne van Doorn (Alterra), Reviewer(s): M. Perez-Soba (Alterra)
- Input: D2.3, WP-1, output (links to other WPs) WP-3, WP-6, WP-7, WP-11, WP-13
- Risks:
  - Poor comparability of EU15 and EU12 due to changing conditions in time and space
  - Too little evidence of cause-effect relationships at specific scale levels
  - Conflicts of interest between various policy fields
- Actions:
  - Workshop with participants of WP2 (February 2013, Theo van der Sluis)
  - Scientific paper: analyses combined results from case studies, lessons learned, Alterra to lead (March 2013, Søren Kristensen, Pia Frederiksen, Giorgia Cosor, Theano Terkenli, Theo van der Sluis).

**D3.1 European-wide maps of recent changes in agriculture, forest systems and HANPP**

- Due M24
- General decisions:
  - A suite of indicators rather than high level of detail for fewer indicators
  - All indicators wall-to-wall at a 1km resolution
  - All indicators should capture change
- First responsible: Tobias Kummerle, Co-authors: EFI, UNIKLU, VUA, Reviewer(s): UCPH
- Input – output (links to other WPs)
  - Land change maps will be provided to WP7 & WP8
  - Data from EFISCEN and DynaCLUE inputs could be valuable (WP7)
- Risks: outcomes will depend on data availability (lower risk) and methods development (identifying appropriate methods – medium risk)
- Actions:
explore potential to build upon work outside VOLANTE (until early 2011, UBER, EFI)
final list of indicators (and priorities) to be developed by mid-2011 (UBER)
work on high-priority indicators (forestry intensity, farmland abandonment, field size) will start in M3 (UBER)

D3.2 Paper on recent land use transition hotspots in Europe

- Due M32
- General decisions: design hotspots criteria as soon as first set of land change maps is available
- First responsible: Tobias Kummerle, Co-authors: EFI, UNIKLU, VUA, Reviewer(s): Alterra, UCPH
- Input – output (links to other WPs): compare/synthesize hotspots vs. hot moments (with WP4)
- Risks: requires input from P3.1, otherwise none
- Actions: Hotspot definition/mapping will be planned by UBER as soon as P3.1 are becoming available

D3.3 Paper on drivers of recent land use transitions in Europe

- Due M36
- General decisions: analyses in P3.3 will cover three aspects (not necessarily to be disseminated in a single paper): (a) non-stationarity in LUCC determinants (geographically-weighted regressions), (b) comparisons of LUCC determinants among regions (logistic models), (c) natural experiment situation to isolate the effect of specific determinants (matching procedures)
- First responsible: Tobias Kummerle
- Co-authors: CPH, EFI, UNIKLU, VUA
- Reviewer(s): UCPH, Alterra
- Input – output (links to other WPs)
  - use the same database of geospatial layers / land use statistics as in WP7
  - compare/synthesize drivers of LUCC (with WP1)
  - compare/synthesize natural experiment situations (with WP2)
- Risks: depends on P3.1, otherwise none
- Actions: gather database of predictors (mid 2011)

D3.4 Maps of syndromes of land system change in Europe

- Due M44
- General decisions
  - few, policy (and/or ecosystem service flow) relevant syndromes
  - use mix of quantitative and qualitative methods to define syndromes
- First responsible Karlheinz Erb, Co-authors: CPH, EFI, UNIKLU, VUA, Reviewer(s): UEDIN, NERI
- Input – output (links to other WPs)
  - WP3 will help to map future syndromes in WP7 & WP11/12
WP-A and WP-V help needed to define policy-relevant syndromes (on the syndromes workshop)

- Risks: none
- Actions: define implementation strategy once land use transition maps and first results from the spatial determinant analyses are available (early/mid 2012)

**D4.1 Report on country list**
- Due M4
- General decisions: countries fixed: AUT, UK, Netherlands, Romania. Pending decisions: GER, ESP/ITA, SWE/FIN, EST/CZE/ALB, DEN
- First responsible: UNIKLU Co-authors: all partners, Reviewer(s): Bas Pedroli, Peter Verburg
- Input – output (links to other WPs) tbd (WP1 or WP2)
- Risks: none
- Actions: decision on SWE/FIN/DEN by UCPH and on GER/EST/CZE/ALB by UNIBER in January.

**D4.2 Databases based on standardised, comparable data formats**
- Due M28
- General decisions: country list finalized in Jan11, time series will consist of time slices, reach back individually for each country at minimum to c1920, preferably to c1850 or before. Consistent data organization among countries will be followed to allow for analyses. List of items will be provided by UNIKLU.
- First responsible: Karlheinz Erb with shared responsibilities according to national studies, Co-authors: all partners, Reviewer(s): Peter Verburg
- Input – output (links to other WPs): Input: EU-Datasets on selected countries from A7. Output to A7
- Risks: historic data collection work intensive and determines the scope of the database. Efforts have to allocated to consistent data gathering of at least on pre-industrial point in time.
- Actions: data collection under shared responsibility, individual planning in June 2011

**D4.3 Report on technological institutional and economic changes**
- Due M30
- General decisions: will complement the biophysical database and is not necessarily organized along countries (as selected in 4.2.), but maybe rather along technologies.
- First responsible: UCPH, Co-authors: UNIKLU, WP2, others tbd, Reviewer(s): Bas Pedroli, Pia Frederiksen
- Input – output (links to other WPs) Input from WP2 (if the focus of it is long-term). Outputs to V9, V11-12, A7, Roadmap
- Risks: none
- Actions: UCPH will take decision on lead and be responsible for planning (Jun11)

**D4.4 Report on country-level analyses**
- Due M36
• General decisions
• will focus on the forest transition phenomenon in Europe and allow for a solid cross-
country approach
• First responsible UBER, Co-authors: UNIKLU, UCPH, UNIBUC, Reviewer: Alex Popp
• Input – output (links to other WPs): Input from A7, P3, Outputs to P3, V9, V11-12, A7,
Roadmap
• Risks: none
• Actions: UBER will lead the planning after availability of first empirical results

D4.5 Report on comparative analysis
• Due M44
• General decisions: focus on drivers of transitions
• First responsible: Karlheinz Erb, Co-authors: all partners, Reviewers: Alex Popp, Hermann
Lotze-Campen
• Input – output (links to other WPs): Input from P3, P1(?), P2, A7, Outputs to P3, V9, V11-12,
A7, Roadmap
• Risks: none
• Actions: UNIKLU will lead the planning after availability of first empirical results

D5.1 A report describing the assessment framework and operational definitions
• Due M9
• General decisions: Organize a meeting with Module Visions to have a consistent
understanding; draft a discussion paper and ask for comments; rework this to the
deliverable
• First responsible: Peter Verburg; co-authors: Hermann Lotze Campen / Alexander Popp /
Marc Metzger / Mark Rounsevell / Sanneke van Asselen / Sandra Lavorel; Reviewer:
Markus Lindner
• Input: WP 9 – output: WP 6,7,8,11,12
• Risks: Assessment methods not consistent with scenario approach and participatory
analysis
• Actions:
  o IVM/UEDIN: draft discussion paper at meeting – February 2010
  o IVM: send around discussion paper and make changes
  o ALL: discuss final version at Berlin Meeting
  o IVM: prepare final version

D5.2 Report describing integration of bottom-up and top-down assessment methods
• Due M18
• General decision: no mechanistic coupling but rather explore complementarities of
approaches and look for added values
• First responsible: Peter Verburg; Co-authors: Mark Rounsevell; Dave Murray; Derek
Robinson; Sanneke van Asselen; Johannes Forster; Hermann Lotze Campen; Alexander
Popp. Reviewer: Karl Heinz Erb
• Input: WP6,7 – output: WP 6,7,8,11,12,13
• Risks: high level of complexity; uncertainty about development of multi-agent framework
• Actions:
  o IVM/UEDIN: first discussion at meeting – February 2010
  o IVM: compile discussion paper after June project meeting
  o ALL: comment
  o IVM: collect preliminary results to illustrate topics
  o ALL: discuss at December meeting
  o IVM: compile final version of deliverable

D5.3 A scientific paper providing an illustration and evaluation of the complementarities and integration
• Due M42
• General decision: -
• First responsible: Peter Verburg; Co-authors: Mark Rounsevell; Dave Murray; Derek Robinson; Sanneke van Asselen; Johannes Forster; Hermann Lotze Campen; Alexander Popp. Reviewer: Karl Heinz Erb
• Input: WP6,7 – output: WP13
• Risks: framework for analysis in D5.2 not followed
• Actions:
  o IVM/UEDIN: follow up D5.2 framework; monitor results to fit in framework; include paper outline in D5.2

D5.4 A documentation of a database for exchanging information between models
• Due M16
• General decisions: database design as simple and functional as possible; no ambitions to develop new standards or to enforce it to other parts of the project.
• First responsible: Hermann Lotze Campen; co-authors: UNIBUC, Alexander Popp, Karl Heinz Erb, Sandra Lavorel; Mark Rounsevell; Derek Robinson; Johannes Forster; Marcus Lindner; Hans van Meijl; Peter Verburg. Reviewer: Hans Verkerk; Andrzej Tabeau
• Input/output: WP6,7,8,11,12
• Risks: involvement of all model partners needed for database design
• Actions:
  o PIK: concept note on database requirements (M3)
  o PIK/UNIBUC: updated discussion note send around based on model inventory (M6)
  o ALL: comment on concept note (M7)
  o UNIBUC: database implementation and testing based on sample data (M12)

D6.1 Report on agent typologies and land use decision rules for the case studies
• Due M15
• General decisions: typologies and decision rules will be developed in conjunction with VOLANTE case study work, based on existing information where available, supplemented with new data collected by the case study teams
• First responsible: Mark Rounsevell, Co-authors: Dave Murray-Rust, Derek Robinson (UEDIN), JRC, UCPH, IVM
• Input – output: WP1, 4, 5, 7, 10
• Risks: lack of availability of case study data from existing and new studies
• Actions:
  o UCPH review of existing case study data (M3)
  o UEDIN and UCPH to organize a scoping workshop to discuss the integration of the case study work with the ABM development (M4)
  o UEDIN review of agent typology literature (M12)

D6.2 Report describing the ABM applications to the case studies
• Due M27
• General decisions: need to review the number of case study applications to be undertaken
• First responsible: Mark Rounsevell, Co-authors: Dave Murray-Rust, Derek Robinson (UEDIN); JRC, UCPH, IVM
• Input – output: WP1, 4, 5, 7, 10
• Risks: volume of work is too large to complete several case studies within the available time
• Actions:
  o UEDIN and UCPH to organize a scoping workshop to discuss the integration of the case study work with the ABM development (M4)
  o UEDIN to build models within existing frameworks and undertake the case study based applications

D6.3 Report describing the up-scaling method with examples of its application
• Due M32
• General decisions: methods need to be developed and refined based on a discussion between various partners, led by UEDIN
• First responsible: Mark Rounsevell co-authors: Dave Murray-Rust, Derek Robinson (UEDIN); JRC, UCPH, IVM
• Input – output: WP1, 4, 5, 7, 10
• Risks: as this is entirely new developmental work, it may prove impossible to define operational methods to fulfil the deliverable
• Actions:
  o UEDIN to lead on method development
  o UEDIN to undertake applications

D7.1 Description of a coupled macroeconomic, multi-sector analysis at global scale with first simulation
• Due M20
• General decisions: Modelling framework should be pragmatic, i.e. model interactions via parameterization (input/output definition, format has to be clearly defined); additional interactions, such as transfer of processes, are optional; research questions are needed for the first assessment (to be defined in the next meeting).
• First responsible: Hermann Lotze-Campen; Co-authors: Alex Popp, Peter Verburg, Markus Lindner, Hans Verkerk, Hans van Meijl, Andrzej Tabeau, Tobias Kuemmerle, JRC; Reviewer(s): Sandra Lavorel, Mark Rounsevell
• Input/output: WP3, WP6, WP8, WP11, WP12
• Risks: involvement of all model partners needed; specific bilateral agreements on data input/output/format required
• Actions:
  o Individual model descriptions to be send to Alex Popp/Hermann Lotze-Campen (M3).
  o Alex Popp/Hermann Lotze-Campen will send matrix for model interaction (M3).
  o Based on this matrix input/output and format for model linkages will be classified in bilateral discussion and sent to Alex/Hermann after finalization (M4).
  o TeleCon for discussion of the interactions (M4).
  o Other LU drivers not included in the models, such as nature conservation have to be discussed in the next meeting.
  o Next meeting in June 2011 (M8)

D7.2 Description of the linked modelling system of sector models and multi-sector assessments
• Due M24
• General decisions: Model interactions should be primarily via parameterization; transfer of processes processes is optional; focus will be on the linking of different sector models
• First responsible: Hermann Lotze-Campen; Co-authors: Alex Popp, Peter Verburg, Markus Lindner, Hans Verkerk, Hans van Meijl, Andrzej Tabeau, Tobias Kuemmerle, JRC; Reviewer(s): Sandra Lavorel, Mark Rounsevell
• Input/output: WP3, WP6, WP8, WP11, WP12
• Risks: involvement of all model partners needed; specific bilateral agreements on data input/output/format required
• Actions:
  o Individual model descriptions to be send to Alex Popp/Hermann Lotze-Campen (M3).
  o Alex Popp/Hermann Lotze-Campen will send matrix for model interaction (M3).
  o Based on this matrix input/output and format for model linkages will be classified in bilateral discussion and sent to Alex/Hermann after finalization (M4).
  o Next meeting in June 2011 (M8)

D7.3 Description of the translation of sector specific land cover and land management information
• Due M36
• General decisions: -
• First responsible: Hermann Lotze-Campen; Co-authors: Alex Popp, Peter Verburg, Markus Lindner, Hans Verkerk, Hans van Meijl, Andrzej Tabeau, Tobias Kuemmerle, JRC; Reviewer(s): Sandra Lavorel, Mark Rounsevell
• Input/output: WP3, WP6, WP8
• Risks: Interactions with WP3 and WP6 important; availability of intermediate results from other WPs
• Actions:
  o To be clarified, what land management information will be available from CAPRI, EFISCEN (Peter Verburg, Hans van Meijl, Hans Verkerk) (M8)
To be clarified how syndromes approach (WP3) can be integrated (Tobias Kuemmerle, Peter Verburg) (M12)

D7.4 Paper indicating the new insights using the integrated modelling system
- Due M40
- General decisions: -
- First responsible: Hermann Lotze-Campen; Co-authors: Alex Popp, Peter Verburg, Markus Lindner, Hans Verkerk, Hans van Meijl, Andrzej Tabeau, Tobias Kuemmerle, JRC; Reviewer(s): Sandra Lavorel, Mark Rounsevell
- Input/output: WP3, WP6, WP8, WP11, WP12
- Risks: Full modelling framework has to be available and working; interactions between different models and WPs is essential
- Actions:
  - Review on available models and concept note on added-value of VOLANTE approach, based on first joint simulations (Hermann Lotze-Campen, Alex Popp, Peter Verburg) (M18)

D8.1 Toolbox for quantifying the capacity of the land system to provide ecosystem services
- Due M24
- General decision: aim for a transparent toolbox of methods for different ecosystem services. Methods should allow projection to scenarios using explicit variables available from WP6/7 models.
- First responsible: Sandra Lavorel
- Co-authors: CNRS postdoc, Peter Verburg, Markus Lindner, Hans Verkerk, Maria Luisa Paracchini, Helmut Haberl, Wilfried Thuiller
- Reviewer(s): ? Mark Rounsevell?
- Input: WP6&7 (land use & management; ecosystem states)– output: WP12
- Risks: non-transparent methods that cannot be implemented into common toolbox
- Actions:
  - ALL: Inventory of partner’s existing methods / variables – M3-5
  - CNRS: Inventory of additional literature methods – M6-11
  - CNRS + ALL: Coding of methods to toolbox and testing – M7-13
  - CNRS + ALL: Comparative and sensitivity analysis of methods – M14-19
  - CNRS: Delivery of toolbox – M20

D8.2 Spatially explicit assessment of current ecosystem service supply for Europe
- Due M27
- General decision: Combine pre-existing maps from previous projects and outputs from new models in toolbox
- First responsible: Peter Verburg
- Co-authors: CNRS postdoc, Sandra Lavorel, Markus Lindner, Hans Verkerk, Maria Luisa Paracchini, Helmut Haberl, Wilfried Thuiller
- Reviewer(s): Mark Rounsevell
- Input: WP6+7 (land use / management; ecosystem states), D8.1 – output: WP10+12
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- **Risks:** Limited. Data availability for some new service models. Identification of relevant metrics for the quantification of actual supply vs. potential provision.
- **Actions:**
  - CNRS: facilitate use of toolbox – M21-26
  - IVM, JRC, EFI: provide existing maps of current ES supply – M12
  - UKLU: provide maps for current HANPP components; UKLU, CNRS and IVM devise conceptual framework for integration of HANPP components into ES assessment – M18
  - IVM, CNRS: generate maps for new service models – M24
  - IVM: spatially explicit assessment of ES supply – M27

**D8.3 Identification of current hot spots and a typology relating to potential causes**

- **Due:** M36
- **General decision:** Investigate alternative methods for hot spot analysis. Analyse supply vs. demand, and relate to land system types and underlying biophysical and human factors
- **First responsible:** Sandra Lavorel
- **Co-authors:** CNRS postdoc, Peter Verburg, Markus Lindner, Hans Verkerk, Maria Luisa Paracchini, Helmut Haberl, Wilfried Thuiller
- **Reviewer(s):** Mark Rounsevell
- **Input:** ES supply maps D8.2, WP6+7 (land use / management; ecosystem states). Output: WP10+12
- **Risks:** difficulty in assessing ES demand; require ++ interactions with WP-P WP7
- **Actions:**
  - CNRS: critical selection of methods for hot spot analysis M24
  - IVM: provide current ES supply maps M27
  - CNRS: coordinate discussion with other WP of relevant indicators for ES demand
  - CNRS + ALL: analyse hot spots and interpret in relation to land system types and underlying biophysical and human factors

**D9.1 A report outlining the scenario framework, storylines and drivers**

- **Due:** M18
- **General decisions:** This needs some careful thought and collaboration with Module A, but development should start ASAP. A first workshop (including Peter Verburg), which should steer the development, is planned for February. An initial list of crucial issues and drivers will be developed in the first months of 2011 to guide the process, and will be discussed with Module A and P. By the summer of 2011 WP9 will come up with a proposed list of drivers, which will be discussed and finalized after the scenario stakeholder meeting [M10]. Following this workshop priority will be given to providing Module A with required information, followed by the enrichment of the storylines.
- **First responsible:** Marc Metzger, Co-authors: Ariane Walz, Mark Rounsevell, Marc Gramberger, Marta Perez-Soba, Peter Verburg, others, Reviewer(s): 1 person from Module A and 1 from Module V who was not too involved in the deliverable (Marcus Lindner)
- **Input – output (links to other WPs):** WP9 and WP10 are closely knit and collaborate on stakeholder issues. There are crucial links with Module A. The models will need to be able to cope with the scenario framework. Early collaboration will increase possibilities for
model adjustment. WP9 should provide early insight to Module A and WP11 and WP12 into the issues/changes that are expected to be most important to the stakeholders and the drivers underpinning this change. Module P should be consulted about possible issues and drivers.

- **Risks:** Stakeholders’ reaction to the framework and the suggested key issues and drivers. Large changes will affect the scenario framework and the Module A models.

- **Actions:**
  - Initial workshop, 15-17 Feb, Marc, Ariane, Mark Peter;
  - Start-up inventory of key issues and drivers, January, Marc;
  - Plan further framework development and scenario workshop, February, Marc, Ariane, WP10.

### D9.2 A report on future land use visions and the stakeholders’ visions onto the scenario framework

- **Due M28**
- **General decisions:** none so far
- **First responsible:** Marc Metzger, Co-authors: Ariane Walz, Mark Rounsevell, Marc Gramberger, Marta Perez-Soba, Peter Verburg, others, Reviewer(s): 1 person from Module A and 1 from Module V who was not too involved in the deliverable (Marcus Lindner)
- **Input – output (links to other WPs):** This deliverable will bring together the document analysis supporting the Visions (WP9), the visions extracted from the stakeholder process (WP10) and has strong link with the modelling activities (WP5, WP11).
- **Risks:** Given the current ideas about the methods for linking the explorative scenarios and normative visions it may not be possible to do this without model runs. This may delay the final delivery.
- **Actions:**
  - Develop working document for linking explorative scenarios and normative visions. Spring 2010.

### D10.1 Stakeholder analyses and involvement plan

- **Due in M10 (September 2011)**
- **General decisions:** Only focused on scenarios, visions and trade-offs workshops and make links to road-mapping. It will describe who we want to involve, how and why. Types of stakeholders to be involved:
  - Scenarios: people acquainted with scenario/foresight analysis on different topics and different parts of EU (regional relevance). Companies, researchers. No policy people.
  - Visions: interest groups (large companies, NGOs, practitioners) considering the four themes and geographical distribution
  - Trade-offs: selected group from the vision workshops + additional stakeholders (policy makers) and scenario workshop participants. Suggestion: to do first the national/regional workshop and then the EU.
  - Roadmap: high level people (CEOs, Director-Generals, etc.) focussing on key questions resulting
The use of crowd-sourcing for complementing visions will be investigated and discussed (half day) during a next meeting at the end of May/beginning of June in Edinburgh (proposed by Marc M.). Then it will be decided the role of crowd-sourcing in the process as a side activity. If used, it should start soon to get max input throughout the whole project. Possible idea is to get the visions from people in the selected geographical areas. List of ‘heavily involved stakeholders’ (to be delivered in month 14). Identification will be a continuous process throughout the project. In addition, we could already involve the key people for the roadmap workshop and invite them to sign an (open) letter of intent, and to assign one of their collaborators for participation in earlier parts of the project. Before contacting them, VOLANTE should produce a good brochure as background info and write the intend letter; PROSPEX can take care of building and maintaining the stakeholders database. We would like to have a task force in the consortium to provide info on stakeholders based on partners’ networks. For example: 14 partners * 20 experts. The first database will be for the scenario workshop.

- First responsible: Marc Gramberger
- Co-authors: Marta Pérez-Soba, Joske Houtkamp, Marc Metzger, Ariane Walz and Bernhard Wolfslehner (EFI)
- Reviewer(s): Anna-Carin Johansson
- Links to other WPs:
  - Input: WP1+ WP2: case-study workshops are an activity independent of the Module Visions stakeholder workshops. Therefore it is advisable to give them another name (meaning not “stakeholder,” but e.g. “interest groups”) to avoid misunderstandings. Access to the Module Processes interest-group’s database is useful for WP10. All partners: to provide names of relevant stakeholders for the database
  - Output: List of ‘heavily involved stakeholders’ (to be delivered in month 14) Stakeholder database: structure will be prepared by PROSPEX and be filled in by WP10 partners and ‘stakeholders’ task force

- Risks: Lack of input from the consortium on relevant stakeholders for the workshops
- Actions:
  - Internal kick-off to get a common understanding of key concepts and activities in WP10 and complete the WP10 planning for the VOLANTE Research Implementation Plan (8 February 2011; minutes circulated to WP10 partners and VOLANTE module leaders)
  - Create a task force in the consortium to provide info on stakeholders based on partners’ networks. Therefore, send an e-mail to one contact person per partner inviting to provide name of person in the organisation to form part of this task force.

**D10.2 Synthesis report on visions workshop**

- Due in M24 (December 2012)
- General decisions: Module Processes’ case-study workshops are an activity independent of the Module Visions stakeholder workshops. Therefore it is advisable to give them another name (meaning not “stakeholder,” but e.g. “interest groups”) to avoid misunderstandings. Access to the Module Processes interest-group’s database is useful for WP10. Go ahead as
planned with the budget prepared by PROSPEX (see Annex 1) – condition: VOLANTE project will cover any future workshop budget shortcomings when they appear);

- Scenario workshop objective is to provide feedback on the scenario framework, the drivers and trends, and enrich the story-lines and uncertainties (consultative approach).

The four vision workshops:
  - Will not have input from the scenario framework;
  - Will create (possibly diverging) multiple visions about what stakeholders want and dream;
  - Will be structured around four main themes linked with main land uses:
    - Nature: conservation, environment
    - Primary production: forests, agriculture (food, wood, energy)
    - Leisure/recreation
    - Building: housing, infrastructure, industry, transport
  - Will be organised in 2012
  - May lead to contrast between visions and scenarios and also among visions (What people want and dream);
  - Will respond to questions as ‘How should the use of land look like in 2040? How will you distribute land? How do you see your life in 2040 regarding working, recreating, consuming (eating), energy, housing?’ Reasons for these assumptions will be elucidated and discussed what may be the impact of the envisioned use of the land;
  - Will start from a general (all) perspective and move towards personal (me) visions;
  - Will include a semantic rating of the participants that will allow for comparison of the four workshops;
  - Will have an ICT component that should either prove an added value, or be used to connect the different types of workshops, or involve large numbers of people as an ‘extra’.

- First responsible: Marta Perez Soba
- Co-authors: Marc Gramberger + other PROSPEXs + Joske Houtkamp, Marc Metzger, Ariane Walz and Bernhard Wolfslehner (EFI)
- Reviewer(s): Mark Rounsevell
- Links to other WPs: Input: D9.1 and D 9.2 Feedback from WP9 workshop on the input and output expected from the scenario and visions workshop. Output: for WP9: scenario workshop will provide feedback on the scenario framework, the drivers and trends, and enrich the story-lines and uncertainties (consultative approach). for WP11: visions workshop will provide (possibly diverging) multiple visions about what stakeholders want and dream as input. The specific output will be: Will provide as output:
  - Generic statements
    - Specific statements for regions and human being activities, and their spatial relation
    - Links to model statements (pre-determined)
    - ‘Visions to take away’ by the participants
    - additional presentation formats may include word-clouds or other
  - Risks: Lack of budget to organise all the workshops as planned; D 9.1 and D 9.2 are not ready in time to provide input for the scenario workshop
• Actions: agreed to go ahead as planned with the budget prepared by PROSPEX – condition: VOLANTE project will cover any future workshop budget shortcomings when they appear; WP9 scenario workshop on 16 February to discuss and plan best interaction with WP10

D10.3 Synthesis report on trade-offs & sustainability limits workshops
• Due in M36 (December 2013)
• General decisions: There will be two trade-off and sustainability limits workshops, planned to be organised in April and June 2013. Not yet decided if they will be focused, respectively, on two different territorial level (European, and national/regional) or will mix the two levels with different stakeholders
• First responsible: Marta Perez Soba, Co-authors: Marc Gramberger + other PROSPEXs + Joske Houtkamp, Marc Metzger, Ariane Walz and Bernhard Wolfslehner (EFI), Reviewer(s): Maria Luisa Paracchini and Sandra Lavorel
• Links to other WPs: Input: From WP11: explorative scenario outcomes. Output: For WP12 and WP13: identification of trade-offs and synergies between different stakeholder’s normative visions and the explorative scenario outcomes from WP11
• Risks: Lack of budget to organise the two workshops as planned; D 11.1 is not ready in time to provide input for the trade-off workshops
• Actions: Agreed to go ahead as planned with the budget prepared by PROSPEX – condition: VOLANTE project will cover any future workshop budget shortcomings when they appear; Close collaboration with WP11 by organization of cross-WPs meetings during the VOLANTE project meetings or ad-hoc during the project.

D11.1 Report documenting the assessment results for the scenarios stored in the database
• Due M34
• General decisions: This WP was not discussed yet in detail, as it is waiting for several inputs from other Volante Tasks (see inputs).
• First responsible: VU-IVM, Co-authors: modelling teams of PIK, EFI, Alterra-LEI, UEDIN (names to be specified later). Reviewer: Sandra Lavorel.
• Risks: highly dependent on inputs from the listed WPs
• Actions:
  o Start of WP 11 in M13
  o Agreements on modelling set-up needed between M18 and M24
  o First results should be processed between M24 and M30

D11.2 Interpretation of scenario results in terms of described and mapped ‘syndromes’ of land change
• Due M38
• General decisions: This WP was not discussed yet in detail, as it is waiting for several inputs from other VOLANTE Tasks (see inputs).
• First responsible: UBER (name to be specified) – Co-authors: UNIKLU, UEDIN, EFI, VU-IVM – Reviewer(s): Bernhard Wolfslehner (EFI), Bas Pedroli (Alterra)
• Links to other WPs: Input – modelling framework WP7 and model runs Task V11.1, goods and service assessment methods in WP8 and WP12, scenarios from WP9, and land change syndrome analysis of WP3 and WP4. Output - WP13 Roadmap Synthesis.
• Risks: Mismatch of analysis scales and processes included between WP 3+4 and Model results.
• Actions:
  o Start of WP 11 in M13
  o Agreement on work plan for Task V11.2 between M30 and M32
  o First draft report to be discussed with Module partners around M36

D11.3 Report describing critical pathways to (un)desired outcomes targeted at discussion support in WP13
• Due M40
• General decisions: This WP was not discussed yet in detail, as it is waiting for several inputs from other VOLANTE Tasks (see inputs).
• First responsible: Marcus Lindner, Co-authors: VU-IVM, UBER, UNIKLU, UEDIN, PIK, Alterra-LEI (Marta Perez-Soba), Reviewer(s): Bas Pedroli (Alterra), Mark Rounsevell (UEDIN)
• Risks: One of the most ambitious and challenging tasks in VOLANTE, critically dependent on inputs from almost all other VOLANTE WPs. Especially important is the sufficient commitment and contribution from key stakeholders in the trade-off analysis workshops.
• Actions:
  o Start of WP 11 in M13
  o Agreement on work plan for Task V11.3 between M30 and M32
  o First draft report to be discussed with Module partners around M39

D12.1 Report documenting the integration of science-based and value-based trade-off analysis methods
• Due M24
• General decisions: special care should be taken on the definitions, scales, mechanisms, and different kinds of trade-offs from the very beginning of the project
• First responsible: Bernard Wolfslehner, Co-authors: Marta Perez-Soba, Sandra Lavorel, M-L Paracchini, Reviewer(s): Marc Metzger, Marcus Lindner
• Links to other WPs: Input: A8.3 trade-off framework; output: V-12.2, 12.3, 12.4 Implementation of trade-off analyses
• Risks: vague definition of trade-offs and heterogeneous understanding of trade-offs persist in later stages of the projects
• Actions:
  o Official Start M13
  o Prior to that, i.e. year 1->review paper on trade-offs and trade-off analysis modalities in the wider context of land use and management
D12.2 Science-based trade-off and synergy evaluation of hot spots and problem spots in future ESS supply

- **Due M45**
- **General decisions**
- **First responsible:** Sandra Lavorel, Co-authors: UNIKLU, Hans Verkerk, Reviewer(s): Peter Verburg (VU-IVM), Bernhard Wolfslehner (EFI)
- **Links to other WPs:** Input – V9.2 scenario framework, A7/V11-modelling results. Output – V12.3, V12.4 overall trade-off analysis, V13 Road Mapping
- **Risks:** end-of-pipe action -> what if input results are not ready/suitable?;
- **Actions:**
  - Start M25
  - Agreement on work plan for Task V12.2 between M25 and M30
  - First results to be discussed with Module partners around M39

D12.3 Value-based trade-off evaluation of future ecosystem service supply under selected land use scenario

- **Due M45**
- **General decisions**
- **First responsible:** Bernerd Wolfslehner, Co-authors: Marta Perez-Soba, M-L Paracchini, Sandra Lavorel, Reviewer(s): Bas Pedroli and Mark Rounsevell
- **Links to other WPs:** Input – A?, V 10 – stakeholder interaction, V12.2; output: V12.4 overall trade-off analysis
- **Risks:** end-of-pipe action -> what if input results are not ready/suitable?; missing consensus about the objectives and functionality of stakeholder interaction and workshops.
- **Actions:**
  - Start M31
  - Agreement on work plan for Task V12.3 between M31 and M36
  - First results to be discussed with Module partners around M39

D12.4 A summary of conflict hot spots, synergies and trade-offs in ecosystem service provision

- **Due M48**
- **General decisions**
- **First responsible:** Bernard Wolfslehner, Co-authors: Alterra-LEI, UEDIN, CNRS, UNIKLU – Reviewer(s): Bas Pedroli and Mark Rounsevell
- **Links to other WPs:** Input – WP 9,10,11, V12.2, 12.3; output: WP 13 - Roadmap
- **Risks:** end-of-pipe action -> what if input results are not ready/suitable?; missing link to the design of the roadmap
- **Actions:**
  - Start M36
  - Agreement on work plan for Task V12.3 between M36 and M39
  - First draft report to be discussed with Module partners around M45

D13.1 Report describing roadmapping methods including plans for workshops

- **Due M40**
• General decisions: activities to be started M36
• First responsible – Bas Pedroli (Alterra). Co-authors – Mark Rounsevell (UEDIN), Marc Gramberger (Prospex), Marta Pérez Soba (Alterra).
• Reviewer(s): SPAC.
• Links to other WPs: General inputs from most other WPs to be considered, but no direct links. Module leaders will have to be consulted.
• Risks: good preparation of the roadmapping exercise crucial for the whole project success!
• Actions:
  o start-up meeting (M36, Bas Pedroli)
  o drafting Report (M36-M40, all)

D13.2 skipped

D13.3 VOLANTE Roadmap (incl. Roadmap Implementation Plan)
• Due M54
• General decisions: activities to be started M36
• First responsible: Bas Pedroli, Co-authors: Mark Rounsevell, Helmut Haberl, Anette Reenberg, Marcus Lindner, Thenano Terkenli, Angheluta Vadineanu, Marc Gramberger, Reviewer(s): SPAC, stakeholder workshop.
• Links to other WPs: Results of all other WPs to be incorporated. Stakeholder to be involved by WP10.
• Risks: highly dependent on inputs from the listed WPs, on the commitment of high profile stakeholders, on the success of the Stakeholder Workshop
• Actions:
  • Draft Roadmap (M36 – M40, Bas Pedroli)
  • Discuss and revise Roadmap (M40 – M50, all)
  • High Level Road mapping Workshop (M50, all)
  • Final Roadmap (M50 – M54, Bas Pedroli, Mark Rounsevell)
  • Roadmap Implementation Plan (M50 – M54, Bas Pedroli, Mark Rounsevell, Eds.)
  • Scientific paper in high impact scientific journal (M40 – M54, Bas Pedroli & Mark Rounsevell, Eds.)

D14.1 VOLANTE Research Implementation Plan (VRIP)
• Due M4, to be updated regularly until M54
• General decisions: to result from the kick-off meeting December 2010 and to be kept updated continuously
• First responsible: Marion Bogers. Co-authors: Bas Pedroli, Søren Kristensen, Marc Metzger, Hermann Lotze-Campen. Reviewer(s): Peter Verburg, Mark Rounsevell
• Links to other WPs: Transversal platform for all WPs.
• Risks: commitment of Module leaders to the transversal issues is crucial
• Actions:
  o compose VRIP (M4, Marion Bogers)
  o put VRIP on VOLANTE website (M4, Marion Bogers)
D14.1 VOLANTE Research Implementation Plan

- regularly update VRIP (every 3 months until M50, Marion Bogers; milestones for CA at M4, M12, M24, M36)

D14.2 Brochure and Draft Paper
- Due M6
- General decisions: “Perspectives Paper” to be based on proposal text, all WP leaders as co-authors
- First responsible: Mark Rounsevell, Bas Pedroli. Co-authors: WP leaders, Reviewer(s): reviewers of the Journal to which the paper will be submitted.
- Links to other WPs: gives reference and guidance to all WPs.
- Risks: small
- Actions:
  - draft paper (31 Jan 2011, Mark Rounsevell)
  - brochure text (15 Feb 2011, Bas Pedroli)
  - comments by co-authors on perspectives paper (15 Feb 2011, all)
  - final draft (28 Feb, Mark Rounsevell, Bas Pedroli)

D15.1 VOLANTE Project Management
- Due: continuous (no specific deliverables defined in DoW)
- General decisions:
  - First responsible – Bas Pedroli. Co-authors – Mark Rounsevell, Marion Bogers, Reviewer(s): EC, SPAC.
  - Links to other WPs: guiding for all WPs.
  - Risks: dependent on continuous following up of actions agreed upon
- Actions
  - Organise internal progress and quality assessment (Marion Bogers)
  - Organise regular PMT meetings (Bas Pedroli, Marion Bogers, Mark Rounsevell)
  - Organise Consortium Assemblies (Marion Bogers, Bas Pedroli, local partners)
  - Keep contact with EC (Bas Pedroli)

D16.1 VOLANTE website
- Due M6
- General decisions:
  - First responsible: Georgia Cosor. Co-authors: Bas Pedroli, Marion Bogers, Reviewer(s): PMT
  - Links to other WPs: input from all WPs.
  - Risks: dependent on continuous following up of input by partners
- Actions
  - Organise flow of input (Georgia Cosor)

D16.2 Media engagement plan to support launch of Roadmap
- Due M42
- General decisions: Start up in M36
- First responsible: Georgia Cosor. Co-authors: Aegean, UCPH, Reviewer(s): PMT
- Links to other WPs: Links to WP2 and WP10
• Risks: none
• Actions
  o Start planning in Month 36 (Georgia Cosor)

**D16.3 Final training modules: Training on land resource management**

• Due M54
• General decisions: Start up in M42
• First responsible: Georgia Cosor. Co-authors: Bas Pedroli, Aegean, UEDIN, UNIKLU, VUA, Reviewer(s): PMT
• Links to other WPs: input from all WPs.
• Risks: dependent on timely delivery of results other WPs
• Actions
  o Start planning in Month 42 (Georgia Cosor)
2. Case study approach

by Søren Bech Pilgaard Kristensen

Presentation of case areas

VOLANTE bases a great deal of the analysis of decision making at the local level and inputs for the bottom-up modelling on empirical data collected in 7 case areas. The original application describes 5 case areas but at the kick-off meeting in December 2010, ALTERRA offered to be responsible for (and finance) 2 additional case studies. The rationale for the use of existing data, is to concentrate on refining existing knowledge rather than spend resources on collecting similar information in new areas. The areas identified have therefore been subject to research by the partner institutions, in some cases for more than 5 decades (Inner Danube Delta), and valuable data is therefore available to VOLANTE. The areas each represent unique and important land change situations in Europe:

1. Gundsø Municipality (15 km from Copenhagen, Denmark): An intensive crop producing municipality undergoing rapid transformation due to its peri-urban location. Responsible partner: UCPH.

2. Reichraming municipality in LTSER platform Eisenwurzen, Alpine Region in Austria: A rural municipality with large percentage forest cover undergoing simultaneous land abandonment and agricultural intensification. Responsible partner: UNIKLU.

3. Inner Danube Delta wetland area in Southern Romania: A Biosphere Reserve/Natura 2000 which has undergone large transformation over the past 5 decades. Current issues concern integrated nature protection / sustainable use. Responsible partner: UNIBUC.

4. Arges County, (part of Neajlov Catchment LTSER) Muntenia. South-central Romania. This area has experienced massive transformation since 1990 as a result of Post-socialist land use change processes. Responsible partner: UNIBUC.

5. Mediterranean Islands, focussing on the Aegean islands which are strongly affected by Especially tourism and the associated functions and lifestyles. This case encompasses four different studies. Responsible partner: Aegean.

6. West Mediterranean agricultural landscape. Portofino regional park (30 km from Genova, Italy). A case of a valuable landscape undergoing land transformation. Responsible partner: ALTERRA.

7. IJssel Valley (NL). Agricultural landscape under urban pressure. Responsible partner: ALTERRA.

It was subsequently decided that case area 1 will be enlarged to encompass all of Roskilde Municipality, as this makes a better match with other case areas in terms of area and heterogeneity. The existing information from Gundsø municipality will be used as historical background information for several themes, as Gundsø municipality was merged with 2 other municipalities in 2007 to form Roskilde Municipality. In addition, it was decided that case area 5
will focus on the island of Lesvos, which was used for two of the four case studies managed by Aegean (case studies 3 and 4 in table 1). Further information about the areas can be found in the report compiled for the kick-off meeting (Kristensen et al: Comparison of VOLANTE case areas: key characteristics and issues for discussion) which can be downloaded from the VOLANTE website under WP1.

**Deliverables involved**
D1.1 Report on meta study of existing empirical data available to VOLANTE
D1.2 Summary reports for each case study including additional data
D1.3 Draft report: analysing combined results from case studies
D1.4 Synthesis report: Upscaling results and cross-region comparisons

The partners responsible for case studies are all part of WP1 in Module Processes, which has the objective to identify main factors which influence local decision making on land use changes in a cross-European perspective. This goal will be met by the use of existing data and to the extent necessary by additional data. It is envisaged that additional data collection will take place during Q3 2011 by each partner and submitted in a report by February 2012 as part of D1.2.

As a preparation for data collection and the formulation of a uniform survey design, an overview of existing data for each case area has been compiled (Table 1 and 2) and crucial issues were discussed at a one-day seminar on February 2nd in Copenhagen. At this meeting, partners from Module Assessment met with partners involved in Module Processes, to discuss issues on data availability, formats, model requirements. Decisions were reached on a number of issues while others need further clarification before decisions can be taken at the Berlin meeting in June 2011.

**Status on case areas**
The following points are based on the material submitted and discussions held sofar in WP1.

**Representativity:** The case areas represent relevant and crucial land management situations in Europe. However, it has not been determined whether they can be considered representative of all major land change situations. In particular, urban landscapes are missing and it was debated that processes of urbanization definitely represent key processes to consider.

**Action:** UCPH will prepare a note on the archetypal land management situations represented by the case areas for the Berlin meeting in June 2011.

**Socio-economic data:** A lot of comparable socio-economic information is available from previous studies in the case areas (Table 2). However, the exact content varies (eg. data source and format). The parameters listed in Table 2 are only a selected group of parameters, more information exists in the individual areas. In several case areas, there is no link between information and the physical location of the informant (eg. address and/or name is unknown), which limits the use of spatial information. In other areas, information was compiled from census information, not from interviews or questionnaires with individuals. All in all, this means that there is a great deal of common information, although the source and format may vary.
**Action:** The need for additional data will be determined at the Berlin meeting.

**Temporal scale:** Most case areas have been used to compile recent information between 2000-2010, which must be considered comparable information. It was debated whether similar time slices should be used to produce historical land cover/use information (e.g., 1970: the decade when many new EU member states joined the EU). This would require digitizing topographical maps/orthophotos in several case areas.

**Action:** The temporal dimension will be determined at the Berlin meeting, and will in part be determined by the needs of other WPs (e.g., WP2).

**Interface with modelling:** Several scenarios exist. One could be to run a simplified model for all case areas, and to run a more comprehensive model for one or two areas, where data availability permits.

**Action:** UEdin will make proposal for modelling strategy and provide a list of data requirements.
<table>
<thead>
<tr>
<th>Location/Land Management situation addressed by case study</th>
<th>Responsible VOLANTE partner</th>
<th>Year of study</th>
<th>Purpose</th>
<th>Spatial unit/area and population</th>
<th>Data source/type</th>
<th>No. and types of respondents involved</th>
<th>Questions on temporal scale?</th>
<th>Addresses:</th>
</tr>
</thead>
</table>
| 1. Urban / peri-urban fringes                           | UCPH                        | 2003         | Assess status, recent changes and future strategies for agricultural properties in peri-urban setting | Gundsø Municipality (15 km from Copenhagen)  
Area: 67 km²  
Pop: 15,000 | Questionnaire survey: data in Access database  
GIS data: IACS data, cadastral information | 125 owners of agricultural properties | Yes, changes in land use, production strategy, etc. 10 year back & ahead | 1, 2 and 3   |
| 2. LTSER platform Eisenwurzen, Alpine Region in Austria: | UNIKLU                      | 2005-2007    | Development of an integrated socio-ecological model (agent-based and stock-flow model) to analyse future developments of land use (agriculture and forestry), socioeconomic parameters and substance flows based on data and interviews; developed with stakeholders in a two-year lasting participatory process | Reichraming, municipality in Upper Austria  
(LTSER region Eisenwurzen)  
Area: 100 km²  
Pop: 1,800 | Questionnaire survey: data in Access database  
Interviews, workshops and focus groups  
GIS data: statistical data, cadastral information | around 60 farmers, around 10 other representativeness of the municipality | Future: model based scenarios on land use change, production strategy and substance flows (N and C) for 2025 Past: data on population, farms, land use, harvest and livestock for single years until 1830 | 1, 2 and 3   |
| 3. Danube Delta Biosphere Reserve/Natura 2000 wetland area | UNIBUC | Ongoing since 1950 | Analysis of hydrological, chemical and physical status of Danube River and Deltas. Since 2000, new topics have been addressed, like: structure of social capital; social capacity; monetary valuation of significant changes in key biodiversity and ecosystem services. | Inner Danube Delta LTSER Area: 3200 km² (3050 km² floodplain) Pop: 350,000 | | 1, 2 and 3 |

<table>
<thead>
<tr>
<th>Project</th>
<th>Institute</th>
<th>Years</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. Comparative research between Mitiline, Lesvos (Greece) and Ayvalik (Turkey). Comparison between Lesvos (N.E. Aegean island) and Arcadia (Prefecture in Peloponnese).</td>
<td></td>
<td></td>
<td>Questionnaire survey, data in SPSS; GIS data.</td>
</tr>
<tr>
<td>4. Assessment of landscape conscience (comparison between rural and urban populations).</td>
<td></td>
<td></td>
<td>GIS data, cadastral information.</td>
</tr>
<tr>
<td>3. Ayvalik (Turkey): 415 questionnaire, Mytiline (Greece): 326 questionnaire. 84 respondents for Lesvos, 85 respondents for Arcadia.</td>
<td></td>
<td></td>
<td>Questionnaire survey, data in SPSS.</td>
</tr>
<tr>
<td>3. 2000's, looking both back and forward in time. 4. 2010, looking both back and forward in time.</td>
<td></td>
<td></td>
<td>1, 2 and 3</td>
</tr>
<tr>
<td>8. Ijssel Valley; Agric landscape under urban pressure</td>
<td>ALTERRA</td>
<td>2003-2004</td>
<td>Assess landscape change based on topo maps &amp; remote sensing. Kilometre squares (e.g. 3 sample areas near Zwolle). Topo Maps 1900, 1950, 1980, 1990, aerial photographs.</td>
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Table 2. Existing socio-economic information in VOLANTE case areas

<table>
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<tr>
<th>Data availability (1: yes, 0: no)</th>
<th>Gundso, DK</th>
<th>Reichraming, AU</th>
<th>Neajlov, RO *</th>
<th>IDD, RO *</th>
<th>Aegean 3</th>
<th>Aegean 4</th>
<th>Ijsel, NL #</th>
<th>Porto-fino, IT ##</th>
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<tr>
<td><strong>Land owner characteristics</strong></td>
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<td></td>
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<td>1</td>
<td>1</td>
<td>1</td>
<td>1?</td>
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<td>Gender</td>
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<td>1</td>
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<td>family status</td>
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<td>1</td>
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<td>years of ownership</td>
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<td>**</td>
<td>**</td>
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<td>Education</td>
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<td>1</td>
<td>1</td>
<td>1</td>
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<tr>
<td>employment status (full-time, hobby farmer, retired)</td>
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<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
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<td>annual income</td>
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<td>1</td>
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<tr>
<td>% of annual income from property activities</td>
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<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
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<td><strong>Property characteristics</strong></td>
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<td>Size</td>
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<td>1</td>
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<td>change of size during past 10 years</td>
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<td>land cover classes (forest, agriculture, other) (ha)</td>
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<td>0</td>
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<td>types of manpower working on property (AWU, owner, employed, temporary, etc)</td>
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<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
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<td>status at time of purchase (eg. Full-time, part-time, hobby farm)</td>
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<td>expected status in 5 years (eg. Full-time, part-time, hobby farm)</td>
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<td>land use types (crops, permanent grass,</td>
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<tr>
<td>Animal production</td>
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<td>types and number of animals in 2003</td>
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<td>Other economic activities on property</td>
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<td>type and persons involved (eg. Owner or other person)</td>
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<td>Duration</td>
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<td>Recreational use of property</td>
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<td>owners' recreational use of property</td>
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<td>others recreational use of property</td>
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<td>Land owner decisions</td>
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<tr>
<td>reason for purchase of property (eg. Production reasons, residential reasons, green values)</td>
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<td>reasons for change/stability of size of property, arable and animal production (eg. Economy, health, change of occupational status)</td>
<td>1</td>
<td>1</td>
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<td>0</td>
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<tr>
<td>reasons for landscape changes (removal, planting, intensification, extensification) (eg. Buying or selling cattle, improve hunting or green values)</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td></td>
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<tr>
<td>reasons for entering into/refusing various subsidy schemes (eg. heavy paperwork, too little payment, enthusiastic nature lover)</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
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</tbody>
</table>

* the data sets are statistical estimates, developed on: a) data from National Statistical Institute; b) previous questionnaires for the area (from past projects). The data sets is not linked with cadastral maps.

** general information available, all the private properties are, as years of ownership, later than 1991.

*** information available about the economic activities from the area, not directly link with a specific property.
# Netherlands, IJssel Valley
Most of the Socio-economic information is not readily available. I have explained to you in the case description report what data we have. However, the good news is: a lot of studies have been done in the past in the Netherlands, few countries had such extensive research I guess (like Denmark probably). Most of the general data will be available, also through our partner LEI, Agri Economical Institute. And even part of the specific farm data, but for that we have to decide exactly on what part of the IJssel valley we will select, and how large the study area should be.

## Portofino Regional Park, Italy:
On socio-economy: we had some 20 in-depth interviews with farmers, on their land, land use, and the history of land use (before WW2). We probably have the interview data in old files, I have to check that. We definitely have the compiled report. Interviews were in 2000 or 2001. It will be difficult to find the same people, because we looked for the elderly farmers that knew the history of the area. So acquiring additional information from them may be difficult. Young people stopped farming because of urbanisation, recreation development and abandonment of farms on these steep slopes.
3. Framework for linking explorative scenarios and normative visions

By Marc Metzger

Introduction

Herbert Kahn’s phrase ‘The most likely future isn’t’ succinctly lays out the motivation and imperative for methods that allow us to explore the future. The phrase embodies the notion that what we think will happen in the future probably will not because the basis of our thought process is itself flawed: our thinking being limited by personal experience, prejudice, and other forms of bias. Scenario analysis has emerged as a means of characterizing the future and its uncertainties through structured, but imaginative thinking as a process that pushes us beyond the axioms and norms that are the constraints of conventional wisdom.

Exploratory scenario storylines are most commonly used in environmental sciences, e.g. in the IPCC Special Report on Emissions Scenarios (SRES), and major European studies such as ATEAM, ALARM, EURURALIS. They describe plausible, but alternative socioeconomic development pathways that allow scenario analysts to compare across a range of different situations, generally from 20 to 100 years into the future. Exploratory scenario storylines typically adopt a coevolutionary stance in which multiple assumptions about different development pathways lead to potentially very different outcomes over long-term time horizons. Although this is the most common use of exploratory scenario storylines, they can also be used to identify different development pathways that lead to similar or converging scenario outcomes. This effect, known as equifinality, can provide valuable insight into the robustness of a given future with respect to alternative scenario storyline assumptions. Equifinal scenario outcomes are rarely discussed in the literature, but are central to the roadmapping concepts in VOLANTE.

A contrasting approach are normative scenario storylines, which are framed around desired futures or outcomes (cf the VOLANTE visions). The storyline itself is a description of the series of events and causal relationships that lead from the current world condition to the desired future world. Inherent to this way of thinking is that very different pathways may exist that converge on the same desired outcome. Policy scenarios are often normative, reflecting the needs of policy to achieve desired outcomes over relatively short-time horizons within a decision process that is often mediated by the political context.

Successful scenario studies should balance saliency (relevance to stakeholder’s needs), credibility (scientific adequacy of the methods) and legitimacy (an unbiased incorporation of divergent values). In practice, this balance is difficult to reach because traditional scenario methods tend to score well on no more than two of the three categories. For example, exploratory scenarios are well established in the literature, and can incorporate rich and diverse storylines, but the general divergent future often lack direct policy relevance. By contrast, normative scenarios are by definition focused on specific desired outcomes, but have lower credibility because they cannot address uncertainties in the trajectories toward the desired future.
In VOLANTE we plan to combine both methods, an exciting challenge which should result in results that score high for are saliency, credibility, and legitimacy. The following sections first describe the conceptual framework for linking exploratory scenarios to normative visions, followed by sections outlining the proposed exploratory scenario framework and the normative visions.

**Conceptual framework for linking exploratory scenarios to normative visions**

The existing VOLANTE models are not designed for back-casting visions. Even if they could, it would be a further challenge to incorporate alternative trajectories to the visions based on uncertainties in socio-economic development pathways. Instead, we plan to use an explorative scenario framework with six marker scenarios (discussed below) to assess multiple outcomes, and compare these outcomes to the visions. For each of the main marker scenarios we plan to run a range of simulations to explore the variation in outcomes that can occur within a marker scenario. Figure 1 illustrates provides a simplified example how the simulations of one indicator can be compared to the VOLANTE visions. In reality this will be a multivariate comparison between model outputs for a range of land use and ecosystem service indicators and the visions, which will be multidimensional.

![Figure 1. Linking explorative scenarios with normative visions.](image)

The VOLANTE models are linked in a hierarchy, with the global trade macro-economic and climate changes provide the context for European land management and allocation models which provide the final land use and ecosystem services indicators. We envisage that this hierarchy can be used to efficiently analyse a range of scenario
variants by making most of the variations in the more flexible European models, thus limiting the runs for the global models. The modelling hierarchy should allow for tracing back causes of changes, support analysis of trade-offs and synergies, and can thus be used to identify desirable pathways for the VOLANTE roadmap. Figure 2 build on the example given in Figure 1 to illustrate how the nested modelling approach can be used to provide a wealth of additional model runs.

The suggested approach places some requirements on the Assessment and Vision modules, which should be will discussed in the relevant work packages and should receive further attention during the next VOLANTE project meeting in June 2011. The most important points are:

1. The model framework has to be flexible and responsive enough to carry out a reasonable number of runs (? > 50). (WP5)
2. The majority of the visions must fall within the scenario space / the scenario space must be wide enough to accommodate the visions (WP9/WP10).
4. A method to aggregate the full range of stakeholder visions to condensed set of consolidated visions which can be analysed and incorporated into the roadmap (WP9 / WP10).

Figure 2. A hierarchical approach to achieving many model runs that can be linked to the visions and used to interpret possible pathways to reach these desired futures.
5. A method for tracing back and understanding the pathways that reach the visions. (WP11)

Following this outline, the exploratory scenarios and normative visions are seen as two independent exercises, which will be linked by the VOLANTE models through WP11 (identification of the pathways) and WP12 (trade-off analysis). It will nevertheless be crucial that there is a large overlap between the scenario space and the visions, and that the land use and ecosystem service indicators modelled using the scenarios match the elements of interest in the visions. Collaboration and collaboration between WP9 (scenario framework linking visions and models) and WP5 (conceptual model framework) and WP10 (stakeholder engagement).
4. Strategy for up- and downscaling

Concept note
by Hermann Lotze-Campen, Alexander Popp, Peter Verburg

One of the major challenges in VOLANTE is to connect global-level models results (for 10-20 world regions, including Europe) through European level models (for nation states and sub-national units) and sub-national models with local-level assessments (either at a fine spatial grid or as specific local case studies) (WP7). In the other direction, results from several specific local case studies and multi-agent model explorations are to be linked with a European-wide grid-based assessment of land use and land management change (Module Processes / WP6). The European-wide grid-based assessment serves as input to the assessment of ecosystem service changes in WP8.

Deliverables involved
D5.2: Report describing integration of bottom-up and top-down assessment methods.
D7.2: Description of the linked modelling system of sector models and multi-sector assessments.
D7.3: Description of the translation of sector specific land cover and land management information.

Downscaling
At the global level supra-national regions have to be harmonized as far as possible. Regional composition of countries between REMIND-MAgPIE, LEITAP and EFI-GTM will most certainly differ. If the models are not flexible in the regional composition, a pragmatic mapping has to be established for consistent information exchange, e.g. by splitting certain regions into fixed shares.

It has to be clarified, whether LEITAP and EFI-GTM cover Europe as one region, or the full number of nation states. LEITAP has a subdivision in single countries except for the Baltic states, Belgium/Luxembourg, Romania/Bulgaria, and Malta/Cyprus (being part of a larger ‘Other Europe’ region). Countries not belonging to the EU are in separate groups.

Results for agriculture in Europe as a whole from LEITAP can be translated with the CAPRI model into sub-national NUTS2 regions across Europe. EFISCEN is using forest regions which correspond in some countries to NUTS2 regions while in other countries less or no spatial detail is available.

National as well as sub-national results of land cover change from CAPRI and EFISCEN will be assigned to the spatial grid within the Dyna-CLUE model. Here we will, as a baseline, follow the EURURALIS approach. Arable land and grassland will be transferred from LEITAP to Dyna-CLUE at the national level. Urban demand will be fed into Dyna-CLUE at the national level. Resulting forest changes at Nuts2-level will be fed into EFISCEN. Agricultural area changes at Nuts2-level will be transferred from CLUE into CAPRI. Output from EFISCEN and CAPRI, e.g. detailed land management...
variables, will be used for ecosystem service assessments (WP8). An additional module in Dyna-CLUE is under development which can further downscale agricultural intensity data from Nuts2-level to a 1-km-grid.

Different scenarios from Dyna-CLUE can be used as boundary conditions or constraints for the local case studies. Conditions and scenarios external to the case studies can be directly derived from the higher-level models.

This procedure of downscaling through a chain of models at different spatial resolution will assure that global and European land use drivers will be consistently translated into local land use scenarios (either at grid level or at specific local points). At each level, an uncertainty analysis/assessment will be conducted.

**Up-scaling**

In VOLANTE, the results from the top-down model assessment will be combined and merged with the bottom-up modelling case studies in the grid-based assessment with Dyna-CLUE. The bottom-up models will inform on changes in land management at specific local conditions, while the top-down models will provide external boundary conditions. This combination will result in new land use patterns in Dyna-CLUE.

However, the five selected case study areas in VOLANTE are very specific to local conditions. In a first step, it has to be assessed whether the selected case studies are representative for local conditions in other parts of Europe. If this is the case, selected results from the case studies can be translated to other regions according to plausible assumptions. If not, additional scenarios based on expert judgment and literature review have to be generated for those regions which are not well represented by any case study. Each grid cell in Dyna-CLUE has to be linked to a type of land management change as derived in the bottom-up models.

The assessment of how representative the case study areas are should be supported by modules Processes and Visions.