Towards multifunctional agricultural landscapes in Europe: Assessing and governing synergies between food production, biodiversity, and ecosystem services – TALE

Template 5.1 for collecting information on the expert assessment of land system characteristics, ecosystem service status and environmental pressures in the TALE case study areas

Lead author: Emma van der Zanden (VU University Amsterdam)

Report short title: Template 5.1 on expert assessment of case study representativeness

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Document information

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1.Introduction

Research based on case studies, or sometimes referred to as 'place-based research', has proved to be an important source of information on land systems, biodiversity and ecosystem services. Case studies allow for a detailed analysis of (location) specific circumstances, such as drivers and consequences of environmental or land use change, as they are rooted in a particular place and context. However, this unique geographical and historical context also inhibits the generalization of results. Therefore, it is necessary to assess how relevant case study research is beyond the selected case study areas of a research project.

As outlined in Milestone 5.1, the systematic representativeness of case studies within the TALE project has two components. The main comparison of case studies is based on a systematic analysis based on (existing) European landscape and rural socio-economic typologies. Attention will also been given to a comparison of European-scale data that is relevant for WP1 (Policy-relevant environmental pressures) and WP2 (Ecosystem services status). As a second part of the analysis, we want to reflect on the case study selection process and the expert assessment of the case study team regarding key characteristics of the local case study area.

In order to gather the relevant information for a comparative analysis by the VU Amsterdam team, we want to ask each case study team to rate the expected values of selected key characteristics of their local case study area, based on their expert knowledge. As this information is intended to lead to an exploratory reflection on the role of case study research and selection within research projects, we believe that information from the project team is sufficient.

The template is structured as follows:

1. Case study selection process
2. Environmental pressures
3. Biophysical and land system characteristics
4. Status of ecosystem services
5. Environmental status

Please fill in the required information relevant for your case study.

Please provide your input until 23.09.2016

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1. CASE STUDY SELECTION PROCESS

- Why was this specific area chosen as the national relevant case study for the TALE project?
- Is the research area (with the current outline as used in TALE) used in previous research? If yes, how long is the research institution that is active in TALE active in the current case study area?
- If available, please provide a selection of publications on previous research carried out in the current case study area.

2. ENVIRONMENTAL PRESSURES

- What are the most underlined drivers of environmental change in the case study area for the period 2006 - 2016? Please divide 10 points over the answers and provide the main direction of change for each selected driver.

Drivers	Points	Direction of change*	Drivers	Points	Direction of change*
Land use/cover change	0	-	Change in population dynamics	3	Population increase
Structural change in agriculture	0	-	Change in urban growth/Residential pressure	3	Moderate urban growth
Agricultural productivity growth	0	-	Change in recreation pressure	0	none
Change in food consumption (European or regional)	0	-	Change in nature protection legislation	0	?
Change in agricultural funding	2	Slight decrease	Change in water demand by different sectors (including agriculture)	10	Increase in water demand for irrigation; especially projected for the future
Change in land use planning policies	0	-	Consequences of climate change	10	More drought limitations in the

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					lowland region of the catchment; especially on coarser soils; Warming favours elevated areas for arable production
If other, please indicate:					

*Please indicate dominant direction of change with symbols: + for "increased", +/- for "no clear direction" and – for "decreased".

- What do you consider as the <u>current</u> most important environmental threats for your case study area (incl. threats to biodiversity and ecosystem services)? Please divide 10 points over the answers.

Threats	Points	Threats	Points
Intensification of agriculture	5	Soil degradation	5
Unsustainable agricultural production methods	5	Nutrient loading and pollution	6
Marginalization (i.e extensification and abandonment)	0	Invasive alien species	3
Fragmentation (e.g absence of biodiversity corridors)	0	Water quality problems	5
Loss of permanent grassland	0	Water quantity problems	6
Soil sealing	6	Consequences of climate change	8
If other, please indicate:			

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3. BIOPHYSICAL AND LAND SYSTEM CHARACTERISTICS

Table 3.1 Biophysical/Land systems - Where would you rank the average values of your case study, when compared to <u>European</u> values?		Lower Q[1] (lowest 25%)	Middle Q	Upper Q (highest 25%)
Indicator	*Indicator specification*			
Land system				
Arable land	% of agricultural area		X	
Economic farm size	St gross margins in ESU (1,200 €)	X		
Field size	In hectare	X		
Nitrogen Application	N-input in kg/ha		X	
Abundance of linear landscape elements	Density			X
Cultural Landscape value	Index			X
Biophysical (whole case study area)*				
Elevation	Mean altitude		X	
Geomorphology	Average height difference			X
Precipitation	Yearly rainfall (mm)			X
Temperature	Mean yearly temperature (˚C)		X	

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[1]Q indicate Quartile. The lower quartile indicates the lowest 25% of the data, the middle quartile indicates the range of 25 to 75% of the data and the upper quartile indicates the highest 25% of the values. This division of data is often used in hotspot analysis, with the lower quartile indicating a "coldspot" and the upper quartile indicating a "hotspot".

*While we focus for all characteristics on agricultural areas only, for 'biophysical characteristics' we make an exception. Please indicate your assessment of these indicators for the whole case study area.

Table 3.2 Biophysical/Land systems - Where would you rank the average values your case study, when compared to <u>national</u> values?				
Indicator	*Indicator specification*	Lower Q (lowest 25%)	Middle Q	Upper Q (highest 25%)
Land system				
Arable land	% of agricultural area			X
Economic farm size	St gross margins in ESU (1,200 €)		X	
Field size	In hectare		X	
Nitrogen Application	N-input in kg/ha		X	
Abundance of linear landscape elements	Density		X	
Cultural Landscape value	Index		X	
Biophysical (whole case study area)*				
Elevation	Mean altitude		X	
Geomorphology	Average height difference		X	
Precipitation	Yearly rainfall (mm)		X	
Temperature	Mean yearly temperature		X	

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			(˚C)			

*While we focus for all characteristics on agricultural areas only, for 'biophysical characteristics' we make an exception. Please indicate your assessment of these indicators for the whole case study area.

4. STATUS OF ECOSYSTEM SERVICES AND BIODIVERSITY

Table 4.1 Ecosystem services - Where would you rank the average values your case study, when compared to Europe values?

Section	Division	Class/Indicator	Indicator specification	Lower Q (lowest 25%)	Middle Q	Upper Q (highest 25%)
Provisioning	Nutrition	Cultivated crops (area coverage)	Cereals	X		
			Sugarbeet	X		
			Oilseeds (e.g. rape, turnip rape, sunflower seeds)	X		
			Vegetables	X		
		Reared animals and their products (density – LSU/km^2)	Herbivores (Dairy & beef cattle, sheep)		X	
			Monogastrics (Pigs, poultry)	X		
Regulation and maintenance	Mediation of flows	Erosion rates	Water erosion (t/ha)			X
		Nutrient leaching	Nitrogen		X	

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Section	Division	Class/Indicator	Indicator specification			
			leaching (kg N/km^2)			
	Maint. of physical, chemical & biological conditions	Pollination	Visitation probability (%)	X?		
		Chemical conditions of freshwaters	N input into groundwater and rivers (kg N/km^2)	X?		
		Micro climate regulation	Soil organic carbon sequestration (Mg C/km2/yr)	X		
Cultural		Aesthetic value	Landscape appreciated by people		X	
		Tourism	Rural tourism potential		X	

Table 4.2 Ecosystem services - Where would you rank the average values your case study, when compared to national values?						
Section	*Division*	*Class/Indicator*	*Indicator specification*	Lower Q (lowest 25%)	Middle Q	Upper Q (highest 25%)
Provisioning	Nutrition	Cultivated crops (area coverage)	Cereals		X	
			Sugarbeet		X	
			Oilseeds (e.g. rape, turnip rape, sunflower seeds)		X	
			Vegetables		X	
		Reared animals and their products (density – LSU/km^2)	Herbivores (Dairy & beef cattle, sheep)		X	
			Monogastrics (Pigs, poultry)	X		
Regulation and maintenance	Mediation of flows	Erosion rates	Water erosion (t/ha)		X	
		Nutrient leaching	Nitrogen		X	

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			Lower Q	Middle Q	Upper Q
		leaching (kg N/km^2)			
Maint. of physical, chemical & biological conditions	Pollination	Visitation probability (%)		X?	
	Chemical conditions of freshwaters	N input into groundwater and rivers (kg N/km^2)		X	
	Micro climate regulation	Soil organic carbon sequestration (Mg C/km2/yr)		X	
Cultural	Aesthetic value	Landscape appreciated by people		X	
	Tourism	Rural tourism potential	X		

Table 4.3 Biodiversity - Where would you rank the average values your case study, when compared to <u>European</u> values?

Indicator	*Indicator specification*	Lower Q (lowest 25%)	Middle Q	Upper Q (highest 25%)
Farmland species richness			X	
Agrobiodiversity	Birds, mammals, reptiles, amphibians and vascular plants dependent on open grassland or arable land.		X	

Table 4.4 Biodiversity - Where would you rank the average values your case study, when compared to <u>national</u> values?

Indicator	*Indicator specification*	Lower Q (lowest 25%)	Middle Q	Upper Q (highest 25%)
Farmland species richness			X	

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Agrobiodiversity	Birds, mammals, reptiles, amphibians and vascular plants dependent on open grassland or arable land.		X	

5. POLICY-RELEVANT ENVIRONMENTAL INDICATORS

Table 5.1 Environmental indicators - Where would you rank the average values your case study, when compared to <u>European</u> values?				
Indicator	*Indicator specification*	Lower Q (lowest 25%)	Middle Q	Upper Q (highest 25%)
Area under permanent grassland	% of agricultural area		X	
Organic farming	% of agricultural area		X	
Area under High Nature Value farmland	% of agricultural area	X		
Area under conservation	Natura 2000 (% of agricultural area)	X		
	National, European (incl. Natura2000) and International conservation areas (% of agricultural area)	X		

Table 5.2 Environmental indicators - Where would you rank the average values your case

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study, when compared to <u>national</u> values?				
Indicator	*Indicator specification*	Lower Q (lowest 25%)	Middle Q	Upper Q (highest 25%)
Area under permanent grassland	% of agricultural area		X	
Organic farming	% of agricultural area		X	
Area under High Nature Value farmland	% of agricultural area		X	
Area under conservation	Natura 2000 (% of agricultural area)	X		
	National, European (incl. Natura2000) and International conservation areas (% of agricultural area)	X		