ENVIEVAL

Development and application of new methodological frameworks for the evaluation of environmental impacts of rural development programmes in the EU

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Report D2.1

Summary report on the review of indicator sets and monitoring approaches

Appendix C

List of suitable indicators based on other frameworks and projects alongside latest version of the CMEF per public good

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Appendix C

List of suitable indicators based on other frameworks and projects alongside latest version of the CMEF per Public Good

List of Tables

Table C1 Indicators for Climate Change Mitigation

	Indicator	Spatial Scale	Unit of Measure	Source
Land use	Afforestation rate	Farm, Regional	Ha/unit of time	PAIS (2001)
	Area of grassland	Farm, Regional	ha	PAIS (2001)
	Area of matorral	Regional, Farm	%	DIS4ME (2005)
	Area of Scrubs	Farm, Regional	ha	PAIS (2001)
	Deforested area	Regional, Farm	%	DIS4ME (2005)
	Forest productivity	Regional, Farm		DIS4ME (2005)
	Fragmentation of land parcels	Regional, Farm	Hectares, Ratio between Utilised Agricultural Area (UAA) and Number of parcels per holdings	DIS4ME (2005)
	Grazing area	Regional, Farm	%	DIS4ME (2005)
	Land abandoned from agriculture	Regional, Farm	Ha/unit of time	DIS4ME (2005)
	Length conservation field margins	Farm	m	AE-FOOTPRINT (2005)
	Share of agricultural area managed by farms with low/medium/high input intensity per hectare	National/regional	% of total UAA	NewCMEF
	Share of UAA with livestock density <1 LU/ha of forage area	National/regional	ha and % of total UAA	NewCMEF
Soil organic content	Organic matter in surface soil	Regional, Farm		DIS4ME (2005), PAIS (2001), IRENA (2004)
	Total estimates of organic carbon content in arable land	National/regional	Mega tons	NewCMEF
	Mean organic carbon content	National/regional	g kg^{-1}	NewCMEF
	Organic carbon content standard deviation	National/regional	g kg^{-1}	NewCMEF
Energy use (total)	Annual use of energy at farm level by fuel type	Farm	(GJ/ha)	IRENA (2004)
	Direct and indirect energy use	Farm	MJ/ha	AE-FOOTPRINT (2005)
	Direct use of energy in agriculture	National/regional	ktoe	NewCMEF
	"	National/regional	% of total final energy consumption	NewCMEF
	"	National/regional	kg of oil equivalent per ha of UAA	NewCMEF
	Direct use of energy in forestry	National/regional	ktoe	NewCMEF
	"	National/regional	% of total final energy consumption	NewCMEF
	"	National/regional	kg of oil equivalent per ha of forestry	NewCMEF
	Direct use of energy in food processing	National/regional	ktoe	NewCMEF
	"	National/regional	% of total final energy consumption	NewCMEF
Direct energy use	Mechanisation index	Regional, Farm	HP/ha	DIS4ME (2005)
	Tillage intensity	Farm, Regional	number	PAIS (2001)
	Tillage operations	Regional, Farm	number	DIS4ME (2005)
Indirect energy use	Consumption of pesticides	Regional, Farm	kg/ha	IRENA (2004), TEPI (2005)
	Direct usage data per pesticide	Farm, Regional		ELISA (2002)
	Pesticide applications to arable land	Farm	Treatment Frequency Index	AE-FOOTPRINT (2005)
	Energy used to produce mineral fertilisers for agricultural use	Farm	(GJ/ha)	IRENA (2004)
	Mineral fertiliser consumption (N and P)	Regional, Farm		IRENA (2004)

	Nitrogen quantity used per hectare of utilised agriculture area	Farm, Regional		TEPI (2005)
	Organic fertiliser input	Farm	kg OM ha	AE-FOOTPRINT (2005)
	Expenditure on water	Regional, Farm	€/ha, use of water (€)/1000 € of output (or % of total production costs)	DIS4ME (2005)
	External Water resources, Percentage of water coming from sources outside of farm boundary.	Regional, Farm	%	DIS4ME (2005)
	Irrigated area	Regional, Farm	%	DIS4ME (2005)
	Wastewater recycling	Regional, Farm	Volume of water recycled or reused expressed in cm/year/farm	DIS4ME (2005)
Emissions	CO2 Emission	Farm	CO_2/kg product	Halberg (2005)
	Aggregated annual emissions of methane (CH_4) and nitrous oxide (N_2O) from agriculture (UNFCCC Sector 4)	National/regional	1000 t of CO_2 equivalent	NewCMEF
	Aggregated annual emissions and removals of carbon dioxide (CO_2) and emissions of methane (CH_4) and nitrous oxide (N_2O) from agricultural soils (grassland and cropland) (UNFCCC Sectors 5.A.B and 5.A.C)	National/regional	1000 t of CO_2 equivalent	NewCMEF, IRENA (2004)
	Total net emissions from agriculture (including soils) (Sectors 4 + 5.A.B + 5.A.C)	National/regional	1000 t of CO_2 equivalent	NewCMEF, IRENA (2004)
	Share of agriculture (including soils) in total net emissions	National/regional	%	NewCMEF
	Total annual NH3 emissions from Synthetic N-fertilisers (NFR sub-sector 4 D 1 a)	National/regional	1000 tonnes of NH3	NewCMEF
	Total annual NH3 emissions from Cattle dairy (NFR sub-sector 4 B 1 a)	National/regional	1000 tonnes of NH3	NewCMEF
	Total annual NH3 emissions from Cattle NON-dairy (NFR sub-sector 4 B 1 b)	National/regional	1000 tonnes of NH3	NewCMEF
	Total annual NH3 emissions from Swine (NFR sub-sector 4 B 8)	National/regional	1000 tonnes of NH3	NewCMEF
	Total annual NH3 emissions Laying hens (NFR sub-sector 4 B 9 a)	National/regional	1000 tonnes of NH3	NewCMEF
	Total annual NH3 emissions from Broilers (NFR sub-sector 4 B 9 b)	National/regional	1000 tonnes of NH3	NewCMEF
	Total annual ammonia NH3 from agriculture (NFR sub-sectors 4B1-9 [excl 4B5] + 4B13 + 4D1a + 4D2a,b,c + 4F + 4G)	National/regional	1000 tonnes of NH3	NewCMEF
Renewable	Land use devoted to energy/biomass crops	Regional, Farm		IRENA (2004)
	Primary energy produced from crops and by-products	Regional, Farm		IRENA (2004)
	Recycled Waste, Percentage of solid waste recycled. The volume of waste which is recycled based on the volume actually generated at source per capita.	Regional, Farm	% Percentage of solid waste recycled (m3 per farm, % of disposal type)	DIS4ME (2005)
	Stock and change of present anthropogenic landscape point features: Wind turbines	Farm, Regional	number, ha, m	PAIS (2001)
	Production of renewable energy from agriculture	National/regional	kilotonnes (1000 tonnes of oil equivalent, kToe)	NewCMEF

	Share of energy for agriculture in production of renewable energy	National/regional	% of total production of renewable energy	NewCMEF
	Production of renewable energy from forestry	National/regional	kilotonnes (1000 tonnes of oil equivalent, kToe)	NewCMEF
	Share of energy from forestry in production of renewable energy	National/regional	% of total production of renewable energy	NewCMEF
Fires	Burned Area (per land use/landscape type)	Regional, Farm	ha	DIS4ME (2005)
	Fire Frequency	Regional, Farm	Number of fires per year on the surface unit of a defined territory, registered over a long period	DIS4ME (2005)
	Fire Protection	Regional, Farm	%	DIS4ME (2005)
	Fire Risk	Regional, Farm	A relative value assigned to different classes of vegetation cover (fire risk cannot be quantified in a simple manner, but it can be estimated on the basis of the flammability of the species present and the structure of the vegetation).	DIS4ME (2005)

Table C2 Indicators for Biodiversity-Wildlife

	Indicator	Spatial Scale	Unit of Measure	Source
land use and land type	Area of Wetlands	Farm, Regional	ha	PAIS (2001)
	Area under nature protection	Regional, Farm		IRENA (2004)
	Area under organic farming	Farm	ha/farm	IRENA (2004)
	Land abandoned from agriculture	Regional, Farm	Ha/unit of time	DIS4ME (2005)
	Forest productivity	Regional, Farm		DIS4ME (2005)
	Deforested area	Regional, Farm	%	DIS4ME (2005)
	Afforestation rate	Farm, Regional	Ha/unit of time	PAIS (2001)
	Proportion of boundaries managed for rare arable plants	Farm	%	AE-FOOTPRINT (2005)
	Length and distribution of different edges	Farm, Regional	m	PAIS (2001)
	Length of field boundaries	Farm	m/ha	AE-FOOTPRINT (2005)
	Length conservation field margins	Farm	m	AE-FOOTPRINT (2005)
	Field margin cultivation	Farm, Regional	yes/no, ha, m	PAIS (2001)
	Proportion of boundaries managed with field margins	Farm	%	AE-FOOTPRINT (2005)
	Length aquatic buffer zones, (e.g. streamside vegetated margins)	Farm	m	AE-FOOTPRINT (2005) PAIS (2001)
	Proportion of watercourse length protected by buffer strips	Farm	%	AE-FOOTPRINT (2005)
	Stock and Change of linear habitats and biotopes in agricultural landscapes (Saumbiotope): Grass margins	Farm, Regional	m, m/unit of time	PAIS (2001)
	Length of "green" linear landscape features maintained and/or restored by farmers: Transhumance tracks	Farm, Regional	m	PAIS (2001)
	Hedgerow cultivation	Farm, Regional	yes/no, ha, m	PAIS (2001)
	Length of hedgerow	Farm	m/ha	AE-FOOTPRINT (2005)
	Proportion of hedgerow managed for wildlife	Farm	%	AE-FOOTPRINT (2005)
	Stock and change of present anthropogenic landscape area features: Urban sprawl	Farm, Regional	ha, ha/unit of time	PAIS (2001)
	Stock and change of present anthropogenic landscape linear features: Traffic infrastructure	Farm, Regional	m, m/unit of time	PAIS (2001)
	Stock and change of present anthropogenic landscape point features: Wind turbines	Farm, Regional	number, ha, m	PAIS (2001)
	Used Agricultural Area (UAA) within protected sites (according to IUCN categories)	Farm, Regional	ha	PAIS (2001)
	% territory under Natura 2000's Special Protection Areas (SPAs)		%	NewCMEF
	% territory under Natura 2000's Sites of Community Importance (SCIs)		%	NewCMEF
	% territory under Natura 2000's network		%	NewCMEF
	% UAA under Natura 2000		%	NewCMEF
	% forest area under Natura 2000		%	NewCMEF
	No active intervention		1000 ha and % of FOWL area protected	NewCMEF
	Minimum intervention		1000 ha and % of FOWL area protected	NewCMEF
	Conservation through active management		1000 ha and % of FOWL area protected	NewCMEF

	Protection of landscapes and specific natural elements		1000 ha and % of FOWL area protected	NewCMEF
biotopes	Conservation status of grassland		Area in km² and % of total assessments of habitats	NewCMEF
	Number of traditional breeds/cultivars	Farm	number	AE-FOOTPRINT (2005)
	Area of crop habitat suited to species conservation	Farm	ha	AE-FOOTPRINT (2005)
	Corridors and linkages between habitat types	Farm, Regional	number, ha	ELISA (2002)
	Flagship species	Farm, Regional	number, species	ELISA (2002)
	Biodiversity conservation	Regional, Farm	Number of species (or selected taxa) and their variations.	DIS4ME (2005)
	Important Bird Areas affected by agricultural intensification and abandonment	Regional, Farm		IRENA (2004)
	Reversing biodiversity decline (FBI)	National/regional	%	IRENA (2004)
	Number of habitats per farm	Farm	number	AE-FOOTPRINT (2005)
	Number of wildlife species per farm	Farm	number	AE-FOOTPRINT (2005)
	Population trends of agriculture related butterfly species	Regional, Farm		IRENA (2004)
	Proportion of farm area that is non-agricultural semi-natural habitat	Farm	%	AE-FOOTPRINT (2005)
	Size/% of characteristic habitat types	Farm, Regional	ha, %	ELISA (2002)
	Species population trends	Farm, Regional	number/unit time	ELISA (2002)
	Species richness	Farm, Regional	Index	ELISA (2002)
	Stock and Change of linear habitats and biotopes in agricultural landscapes (Saumbiotope): Arable field margins	Farm, Regional	m, m/unit of time	PAIS (2001)
	Stock and Change of linear habitats and biotopes in agricultural landscapes (Saumbiotope): Woodland margins	Farm, Regional	m, m/unit of time	PAIS (2001)
	Stock and Change of point habitats and biotopes in agricultural landscapes	Farm, Regional	number, ha, m	PAIS (2001)
	Stock and change of valuable biotopes and habitats in agricultural landscapes (area features) managed by farmers in: Extensive managed grassland areas	Farm, Regional	ha, ha/unit of time	PAIS (2001)
	Stock and change of valuable biotopes and habitats in agricultural landscapes (area features) managed by farmers in: Old olive groves	Farm, Regional	ha, ha/unit of time	PAIS (2001)
	Stock and change of valuable biotopes and habitats in agricultural landscapes (area features) managed by farmers in: Traditionally managed orchards	Farm, Regional	ha, ha/unit of time	PAIS (2001)
input use-pollution	Consumption of pesticides	Regional, Farm	kg ()/ha	IRENA (2004)
	Pesticide applications to arable land	Farm	Treatment Frequency Index	AE-FOOTPRINT (2005)
	Pesticides used per hectare of utilised agriculture area	Farm, Regional		TEPI (2005)
	Pesticide soil contamination	Regional, Farm		IRENA (2004)
	Pesticides in soil	Farm, Regional	pesticide/ha	ELISA (2002)
	Pesticide use, Active Ingredients	Farm	(∑ kg AI)/ha	Halberg (2005)
	Pesticides in water	Regional, Farm		IRENA (2004)

	Pesticides in groundwater	Farm, Regional	ppm???	ELISA (2002)
	Pesticides in rivers/surface waters	Farm, Regional	ppm???	ELISA (2002)
	Fertiliser applications to arable land	Farm	kg N/ha	AE-FOOTPRINT (2005)
	Mineral fertiliser consumption (N and P)	Regional, Farm		IRENA (2004)
	Nitrogen quantity used per hectare of utilised agriculture area	Farm, Regional		TEPI (2005)
	Nitrates in freshwater - Surface water		% of monitoring stations in each concentration class (6 classes) (mg/l NO_3-N)	NewCMEF
	Nitrates in water	Regional, Farm		IRENA (2004)
	Nitrate in rivers	Farm, Regional	ppm???	ELISA (2002)
	Improvement in water quality: Changes in gross nutrient balance	National/regional	kg/ha and %	IRENA (2004)
	Emissions of nutrients	Farm, Regional		TEPI (2005)
	Emissions of methane and nitrous oxide	Regional		IRENA (2004)
	Water quality	Regional, Farm	Specific electrical conductivity (dS/m, mmol/L)	DIS4ME (2005)
land management	Cropping methods (soil cover and tillage methods)	Regional, Farm		IRENA (2004)
	Tillage intensity	Farm, Regional	number	PAIS (2001)
fires	Fire Frequency	Regional, Farm	Number of fires per year on the surface unit of a defined territory, registered over a long period	DIS4ME (2005)
	Fire Protection	Regional, Farm	%	DIS4ME (2005)
	Fire Risk	Regional, Farm	A relative value assigned to different classes of vegetation cover (fire risk cannot be quantified in a simple manner, but it can be estimated on the basis of the flammability of the species present and the structure of the vegetation).	DIS4ME (2005)
	Burned Area	Regional, Farm	ha	DIS4ME (2005)

Table C3 Indicators for Biodiversity-HNV

	Indicator	Spatial Scale	Unit of Measure	Source
land use and land type	Area of grassland	Farm, Regional	ha	PAIS (2001)
	Area of hillslope cultivated	Regional, Farm		DIS4ME (2005)
	Area of matorral	Regional, Farm	%	DIS4ME (2005)
	Area of Scrubs	Farm, Regional	ha	PAIS (2001)
	Area under nature protection	Regional, Farm		IRENA (2004)
	Area under organic farming	Farm	ha/farm	IRENA (2004)
	Land abandoned from agriculture	Regional, Farm	Ha/unit of time	DIS4ME (2005)
	Forest productivity	Regional, Farm		DIS4ME (2005)
	Deforested area	Regional, Farm	%	DIS4ME (2005)
	Afforestation rate	Farm, Regional	Ha/unit of time	PAIS (2001)
	Area under specific farming or management practices aiming at landscape conservation (traditional agricultural land use practices): Alpine meadows	Farm, Regional	ha	PAIS (2001)
	Area under specific farming or management practices aiming at landscape conservation (traditional agricultural land use practices):Orchards	Farm, Regional	ha	PAIS (2001)
	Share of agricultural area managed by farms with low/medium/high input intensity per hectare		% of total UAA	NewCMEF
	Maintenance of HNV farmland and forestry	National/regional	ha	IRENA (2004)
	Share of UAA with livestock density <1 LU/ha of forage area		ha and % of total UAA	NewCMEF
	Grazing area	Regional, Farm	%	DIS4ME (2005)
	Grazing control	Regional, Farm	Stocking rate vs grazing capacity, both expressed in Sheep Equivalents/ha/year (SE/ha/yr)	DIS4ME (2005)
	Grazing intensity, Grazing intensity in a silvo-pastoral environment is defined as a value included between 0 and 1, obtained as r2 relative to a direct correlation between the level of vegetation cover (%) and the livestock load (animal heads/ha per year) The value represents the contribution of grazing to the level of pressure vegetation is subjected to.	Regional, Farm	A-dimensional, values between 0 and 1.	DIS4ME (2005)
	Soil cover by crops	Farm, Regional	ha	PAIS (2001)
	Soil cover by stubble and mulch	Farm, Regional	ha	PAIS (2001)
	Land cover change	Regional, Farm		IRENA (2004)
	Land use change	Regional, Farm		IRENA (2004)
	Period of existing land use type	Regional, Farm	years	DIS4ME (2005)
	Stock and change of semi-natural and natural land	Farm, Regional	ha, ha/unit of time	PAIS (2001)
	Stock and change of Used Agricultural Area	Farm, Regional	ha, ha/unit of time	PAIS (2001)
	Crop diversity	Farm, Regional	ha	PAIS (2001)
	Natural vegetation	Regional, Farm	ha	DIS4ME (2005)
	Vegetation quality index	Regional	VQI = (fire risk*erosion protection*drought resistance*vegetation cover)**1/4	DIS4ME (2005)
	Shannon Diversity Index	Farm, Regional	Index	PAIS (2001)

	Spatial complexity	Farm, Regional	Index	ELISA (2002)
	Patch Shape of agricultural parcels	Farm, Regional	%, ha	PAIS (2001)
	Forest fragmentation	Regional, Farm	%	DIS4ME (2005)
	Fragmentation of land parcels	Regional, Farm	Hectares, Ratio between Utilised Agricultural Area (UAA) and Number of parcels per holdings	DIS4ME (2005)
	Land recognised for its scenic or scientific value	Farm, Regional	Index	ELISA (2002)
	Proportion of arable land managed with winter stubbles	Farm	%	AE-FOOTPRINT (2005)
	Proportion of boundaries managed for rare arable plants	Farm	%	AE-FOOTPRINT (2005)
	Length and distribution of different edges	Farm, Regional	m	PAIS (2001)
	Length of field boundaries	Farm	m/ha	AE-FOOTPRINT (2005)
	Length conservation field margins	Farm	m	AE-FOOTPRINT (2005)
	Field margin cultivation	Farm, Regional	yes/no, ha, m	PAIS (2001)
	Proportion of boundaries managed with field margins	Farm	%	AE-FOOTPRINT (2005)
	Length aquatic buffer zones, (e.g. streamside vegetated margins)	Farm	m	AE-FOOTPRINT (2005) PAIS (2001)
	Proportion of watercourse length protected by buffer strips	Farm	%	AE-FOOTPRINT (2005)
	Stock and Change of linear habitats and biotopes in agricultural landscapes (Saumbiotope): Grass margins	Farm, Regional	m, m/unit of time	PAIS (2001)
	Length of "green" linear landscape features maintained and/or restored by farmers: Transhumance tracks	Farm, Regional	m	PAIS (2001)
	Hedgerow cultivation	Farm, Regional	yes/no, ha, m	PAIS (2001)
	Length of hedgerow	Farm	m/ha	AE-FOOTPRINT (2005)
	Proportion of hedgerow managed for wildlife	Farm	%	AE-FOOTPRINT (2005)
	Terraces (presence of)	Regional, Farm	%	DIS4ME (2005)
	Proportion of terraced land	Farm	%	AE-FOOTPRINT (2005)
	Stock and change of historical – cultural landscape linear features: Terraces	Farm, Regional	m, m/unit of time	PAIS (2001)
	Stock and change of historical – cultural landscape linear features: Stone walls	Farm, Regional	m, m/unit of time	PAIS (2001)
	Stock and change of historical – cultural landscape linear features: Ancient roads	Farm, Regional	m, m/unit of time	PAIS (2001)
	Stock and change of historical – cultural landscape area features: Historical agricultural parcel pattern	Farm, Regional	ha, ha/unit of time	PAIS (2001)
	Stock and change of historical – cultural landscape point features	Farm, Regional	number, ha, m	PAIS (2001)
	Stock and change of present anthropogenic landscape area features: Urban sprawl	Farm, Regional	ha, ha/unit of time	PAIS (2001)
	Stock and change of present anthropogenic landscape linear features: Traffic infrastructure	Farm, Regional	m, m/unit of time	PAIS (2001)
	Stock and change of present anthropogenic landscape point features: Wind turbines	Farm, Regional	number, ha, m	PAIS (2001)

	Used Agricultural Area (UAA) within protected sites (according to IUCN categories)	Farm, Regional	ha	PAIS (2001)
	% territory under Natura 2000's Special Protection Areas (SPAs)		%	NewCMEF
	% territory under Natura 2000's Sites of Community Importance (SCIs)		%	NewCMEF
	% territory under Natura 2000's network		%	NewCMEF
	% UAA under Natura 2000		%	NewCMEF
	% forest area under Natura 2000		%	NewCMEF
	No active intervention		1000 ha and % of FOWL area protected	NewCMEF
	Minimum intervention		1000 ha and % of FOWL area protected	NewCMEF
	Conservation through active management		1000 ha and % of FOWL area protected	NewCMEF
	Protection of landscapes and specific natural elements		1000 ha and % of FOWL area protected	NewCMEF
biotopes	Conservation status of grassland		Area in km² and % of total assessments of habitats	NewCMEF
	Number of traditional breeds/cultivars	Farm	number	AE-FOOTPRINT (2005)
	Area of crop habitat suited to species conservation	Farm	ha	AE-FOOTPRINT (2005)
	Corridors and linkages between habitat types	Farm, Regional	number, ha	ELISA (2002)
	Flagship species	Farm, Regional	number, species	ELISA (2002)
	Biodiversity conservation	Regional, Farm	Number of species (or selected taxa) and their variations.	DIS4ME (2005)
	Important Bird Areas affected by agricultural intensification and abandonment	Regional, Farm		IRENA (2004)
	Proportion of farm area that is non-agricultural semi-natural habitat	Farm	%	AE-FOOTPRINT (2005)
	Size/% of characteristic habitat types	Farm, Regional	ha, %	ELISA (2002)
	Species population trends	Farm, Regional	number/unit time	ELISA (2002)
	Species richness	Farm, Regional	Index	ELISA (2002)
	Stock and Change of linear habitats and biotopes in agricultural landscapes (Saumbiotope): Arable field margins	Farm, Regional	m, m/unit of time	PAIS (2001)
	Stock and Change of linear habitats and biotopes in agricultural landscapes (Saumbiotope): Woodland margins	Farm, Regional	m, m/unit of time	PAIS (2001)
	Stock and Change of point habitats and biotopes in agricultural landscapes	Farm, Regional	number, ha, m	PAIS (2001)
	Stock and change of valuable biotopes and habitats in agricultural landscapes (area features) managed by farmers in: Extensive managed grassland areas	Farm, Regional	ha, ha/unit of time	PAIS (2001)
	Stock and change of valuable biotopes and habitats in agricultural landscapes (area features) managed by farmers in: Old olive groves	Farm, Regional	ha, ha/unit of time	PAIS (2001)
	Stock and change of valuable biotopes and habitats in agricultural landscapes (area features) managed by farmers in: Traditionally managed orchards	Farm, Regional	ha, ha/unit of time	PAIS (2001)

genetic diversity	Genetic diversity in farm species	Farm, Regional	Index	ELISA (2002)
	Genetic diversity in semi-natural agro-ecosytems	Farm, Regional	Index	ELISA (2002)
	Livestock genetic diversity	Farm	index	AE-FOOTPRINT (2005)
input use-pollution	Consumption of pesticides	Regional, Farm	kg ()/ha	IRENA (2004)
	Pesticide applications to arable land	Farm	Treatment Frequency Index	AE-FOOTPRINT (2005)
	Pesticides used per hectare of utilised agriculture area	Farm, Regional		TEPI (2005)
	Pesticide soil contamination	Regional, Farm		IRENA (2004)
	Pesticides in soil	Farm, Regional	pesticide/ha	ELISA (2002)
	Pesticide use, Active Ingredients	Farm	(∑ kg AI)/ha	Halberg (2005)
	Pesticides in water	Regional, Farm		IRENA (2004)
	Pesticides in groundwater	Farm, Regional	ppm???	ELISA (2002)
	Pesticides in rivers/surface waters	Farm, Regional	ppm???	ELISA (2002)
	Fertiliser applications to arable land	Farm	kg N/ha	AE-FOOTPRINT (2005)
	Mineral fertiliser consumption (N and P)	Regional, Farm		IRENA (2004)
	Nitrogen quantity used per hectare of utilised agriculture area	Farm, Regional		TEPI (2005)
	Nitrates in freshwater - Surface water		% of monitoring stations in each concentration class (6 classes) (mg/l NO_3-N)	NewCMEF
	Nitrates in water	Regional, Farm		IRENA (2004)
	Nitrate in rivers	Farm, Regional	ppm???	ELISA (2002)
	Improvement in water quality: Changes in gross nutrient balance	National/regional	kg/ha and %	IRENA (2004)
	Emissions of nutrients	Farm, Regional		TEPI (2005)
	Emissions of methane and nitrous oxide	Regional		IRENA (2004)
	Water quality	Regional, Farm	Specific electrical conductivity (dS/m, mmol/L)	DIS4ME (2005)
land management	Cropping methods (soil cover and tillage methods)	Regional, Farm		IRENA (2004)
	Tillage intensity	Farm, Regional	number	PAIS (2001)
	Drainage density	Regional, Farm	A measure of the length of stream channel per unit area of drainage basin	DIS4ME (2005)
	Drainage type	Regional, Farm		DIS4ME (2005)
	Reclamation of affected soils	Regional, Farm		DIS4ME (2005)
	Reclamation of mining areas	Regional, Farm		DIS4ME (2005)
soil erosion	Soil erosion	Regional, Farm		IRENA (2004)
	Soil erosion (measured)	Regional, Farm		DIS4ME (2005)
	Soil erosion (USLE)	Subregional	T/ha·year	DIS4ME (2005)
	Soil erosion control measures	Regional, Farm	%	DIS4ME (2005)
	Soil loss index	Regional, Farm		DIS4ME (2005)
	Estimated agricultural area affected by moderate to severe water erosion (>11 t/ha/yr)		1000 ha at national level, ha at regional level	NewCMEF
	Share of estimated agricultural area affected by moderate to severe water erosion (>11 t/ha/yr)		%	NewCMEF

fires	Fire Frequency	Regional, Farm	Number of fires per year on the surface unit of a defined territory, registered over a long period	DIS4ME (2005)
	Fire Protection	Regional, Farm	%	DIS4ME (2005)
	Fire Risk	Regional, Farm	A relative value assigned to different classes of vegetation cover (fire risk cannot be quantified in a simple manner, but it can be estimated on the basis of the flammability of the species present and the structure of the vegetation).	DIS4ME (2005)
	Burned Area	Regional, Farm	ha	DIS4ME (2005)

Table C4 Indicators for Water Quality

	Indicator	Spatial Scale	Unit of Measure	Source
water pollution	Water quality	Regional, Farm	Specific electrical conductance (dS/m, mmol/L)	DIS4ME (2005)
	Consumption of pesticides			
	Pesticide applications to arable land	Farm	Treatment Frequency Index	AE-FOOTPRINT (2005)
	Pesticides in groundwater	Farm, Regional	ppm???	ELISA (2002)
	Pesticides in rivers/surface waters	Farm, Regional	ppm???	ELISA (2002)
	Pesticides in water	Regional, Farm		IRENA (2004)
	Direct usage data per pesticide	Regional, Farm	kg/ha	IRENA (2004)
	Fertiliser applications to arable land	Farm, Regional		ELISA (2002)
	Mineral fertiliser consumption (N and P)	Regional, Farm		IRENA (2004)
	Organic fertiliser input	Farm	kg OM ha	AE-FOOTPRINT (2005)
	Improvement in water quality: Changes in gross nutrient balance	National/regional	kg/ha and %	IRENA (2004)
	Emissions of nutrients	Farm, Regional		TEPI (2005)
	Nitrogen quantity used per hectare of utilised agriculture area	Farm, Regional		TEPI (2005)
	Nitrate in drinking water	Farm, Regional	ppm???	ELISA (2002)
	Nitrate in groundwater	Farm, Regional	ppm???	ELISA (2002)
	Nitrate in rivers	Farm, Regional	ppm???	ELISA (2002)
	Nitrates in water	Regional, Farm		IRENA (2004)
	Nitrates in freshwater - Surface water		% of monitoring stations in each concentration class (6 classes) (mg/l NO_3-N)	NewCMEF
	Nitrates in freshwater - Groundwater		% of monitoring stations in each concentration class (4 classes) (mg/l NO_3-N)	NewCMEF
	Potential surplus of nitrogen on agricultural land		Potential surplus of nitrogen on agricultural land (kg N/ha/year)	NewCMEF
	Potential surplus of phosphorus on agricultural land		Potential surplus of phosphorus on agricultural land (kg P/ha/year)	NewCMEF
	Soil erosion control measures	Regional, Farm	%	DIS4ME (2005)
	Soil water conservation measures	Regional, Farm	%	DIS4ME (2005)
	Soil erosion (USLE)	Sub-regional	T/ha·year	DIS4ME (2005)
	Mean estimated rate of soil loss by water erosion		tonnes/ha/year	NewCMEF
land use and land cover	Share of agricultural area managed by farms with low/medium/high input intensity per hectare		% of total UAA	NewCMEF
	Irrigated area	Regional, Farm	%	DIS4ME (2005)
	Total cultivated area irrigated at least once a year (actual irrigated area)	Farm		IRENA (2004)
	Total irrigable area (area covered with irrigation infrastructure)	Farm	%	IRENA (2004)
	Area under organic farming	Farm	ha/farm	IRENA (2004)
	Area of Wetlands	Farm, Regional	ha	PAIS (2001)
	Grazing area	Regional, Farm	%	DIS4ME (2005)
	Grazing control	Regional, Farm	Stocking rate vs grazing capacity, both expressed in Sheep Equivalents/ha/year (SE/ha/yr)	DIS4ME (2005)

	Grazing intensity, Grazing intensity in a silvo-pastoral environment is defined as a value included between 0 and 1, obtained as r2 relative to a direct correlation between the level of vegetation cover (%) and the livestock load (animal heads/ha per year) The value represents the contribution of grazing to the level of pressure vegetation is subjected to.	Regional, Farm	A-dimensional, values between 0 and 1.	DIS4ME (2005)
	Share of UAA with livestock density <1 LU/ha of forage area		ha and % of total UAA	NewCMEF
	Stock and Change of linear habitats and biotopes in agricultural landscapes (Saumbiotope): Grass margins	Farm, Regional	m, m/unit of time	PAIS (2001)
	Stock and change of valuable biotopes and habitats in agricultural landscapes (area features) managed by farmers in: Extensive managed grassland areas	Farm, Regional	ha, ha/unit of time	PAIS (2001)
	Area under specific farming or management practices aiming at landscape conservation (traditional agricultural land use practices): Extensive grassland management schemes	Farm, Regional	ha	PAIS (2001)
	Stock and Change of linear habitats and biotopes in agricultural landscapes (Saumbiotope): River banks (streamside vegetated margins)	Farm, Regional	m, m/unit of time	PAIS (2001)
	Length aquatic buffer zones, (e.g. streamside vegetated margins)	Farm	m	AE-FOOTPRINT (2005) PAIS (2001)
	Proportion of watercourse length protected by buffer strips	Farm	%	AE-FOOTPRINT (2005)
	Field margin cultivation	Farm, Regional	yes/no, ha, m	PAIS (2001)
	Cropping methods (soil cover and tillage methods)	Regional, Farm		IRENA (2004)
water quantity-water use	Water consumption	Farm, Regional	volume	PAIS (2001)
	Water consumption	Farm	m^3 ha	AE-FOOTPRINT (2005)
	Water consumption by farm sectors (I.e. crop types, livestock)	Regional, Farm	cubic meters per year, % per sector	DIS4ME (2005)
	Volume of water which is applied to soils for irrigation purposes		1000 m^3	NewCMEF
	Water Availablity for irrigation	Regional, Farm	Annual withdrawal of ground and surface water (m^3/farm), Consumption per farm (m^3/farm)	DIS4ME (2005) IRENA (2004)
	Water scarcity, change in difference in water availablity over temporal scale	Regional, Farm	Cubic metres per year	DIS4ME (2005)
	Ground water abstraction	Farm, Regional		TEPI (2005)
	Ground water levels	Regional, Farm		IRENA (2004)
	Groundwater depth (change in)	Regional, Farm	m	DIS4ME (2005)
	Water storage capacity	Regional, Farm	depth (mm) or volume	DIS4ME (2005)
	Aquifer over exploitation	Regional	hm^3 of water/year	DIS4ME (2005)
	Runoff water storage	Regional, Farm	mm, or % of the total runoff water stored.	DIS4ME (2005)
	Rainfall-runoff relationship	Regional, Farm		DIS4ME (2005)

	External Water Runoff, Percentage of used water run-off into local/regional catchment or watershed	Regional, Farm	%	DIS4ME (2005)
water supply system	Water leakage, Water leaked from the distribution system	Regional, Farm	%	DIS4ME (2005)
	Irrigation intensity	Regional, Farm		DIS4ME (2005)
	Irrigation potential realised	Regional, Farm	%	DIS4ME (2005)
	Irrigation technique	Farm, Regional	index	PAIS (2001)
	Drainage type	Regional, Farm		DIS4ME (2005)
	Drainage density	Regional, Farm	A measure of the length of stream channel per unit area of drainage basin	DIS4ME (2005)
	Use of sewage sludge	Regional, Farm		IRENA (2004)
	Type and capacity of storage for farm manure and slurry	Regional, Farm		IRENA (2004)
	Quality of livestock housing	Farm	Index	AE-FOOTPRINT (2005)

Table C5 Indicators for Soil Quality

	Indicator	Spatial Scale	Unit of Measure	Source
land use and land cover	Acidified area	Regional, Farm	% area of surface soil with pH below 6.0	DIS4ME (2005)
	Area of hillslope cultivated	Regional, Farm		DIS4ME (2005)
	Area of marginal soil used	Regional, Farm	Ha (also % of total cultivated area)	DIS4ME (2005)
	Area under organic farming	Farm	ha/farm	IRENA (2004)
	Share of agricultural area managed by farms with low/medium/high input intensity per hectare		% of total UAA	NewCMEF
	Share of UAA with livestock density <1 LU/ha of forage area		ha and % of total UAA	NewCMEF
	Grazing area	Regional, Farm	%	DIS4ME (2005)
	Grazing control	Regional, Farm	Stocking rate vs grazing capacity, both expressed in Sheep Equivalents/ha/year (SE/ha/yr)	DIS4ME (2005)
	Grazing intensity, Grazing intensity in a silvo-pastoral environment is defined as a value included between 0 and 1, obtained as r2 relative to a direct correlation between the level of vegetation cover (%) and the livestock load (animal heads/ha per year) The value represents the contribution of grazing to the level of pressure vegetation is subjected to.	Regional, Farm	A-dimensional, values between 0 and 1.	DIS4ME (2005)
	Irrigated area	Regional, Farm	%	DIS4ME (2005)
	Soil cover by crops	Farm, Regional	ha	PAIS (2001)
	Soil cover by stubble and mulch	Farm, Regional	ha	PAIS (2001)
	Proportion of arable land managed with winter stubbles	Farm	%	AE-FOOTPRINT (2005)
	Field margin cultivation	Farm, Regional	yes/no, ha, m	PAIS (2001)
	Proportion of terraced land	Farm	%	AE-FOOTPRINT (2005)
	Terraces (presence of)	Regional, Farm	%	DIS4ME (2005)
	Stock and change of historical – cultural landscape linear features: Terraces	Farm, Regional	m, m/unit of time	PAIS (2001)
	Stock and change of valuable biotopes and habitats in agricultural landscapes (area features) managed by farmers in: Extensive managed grassland areas	Farm, Regional	ha, ha/unit of time	PAIS (2001)

	Area under specific farming or management practices aiming at landscape conservation (traditional agricultural land use practices): Extensive grassland management schemes	Farm, Regional	ha	PAIS (2001)
soil contamination	Improvement in water quality: Changes in gross nutrient balance	National/regional	kg/ha and %	IRENA (2004)
	Nitrogen quantity used per hectare of utilised agriculture area	Farm, Regional		TEPI (2005)
	Potential surplus of nitrogen on agricultural land		Potential surplus of nitrogen on agricultural land (kg N/ha/year)	NewCMEF
	Potential surplus of phosphorus on agricultural land		Potential surplus of phosphorus on agricultural land (kg P/ha/year)	NewCMEF
	Mineral fertiliser consumption (N and P)	Regional, Farm		IRENA (2004)
	Fertiliser applications to arable land	Farm	kg N/ha	AE-FOOTPRINT (2005)
	Pesticide applications to arable land	Farm	Treatment Frequency Index	AE-FOOTPRINT (2005)
	Pesticides in soil	Farm, Regional	pesticide/ha	ELISA (2002) IRENA (2004)
	Pesticide use, Active Ingredients	Farm	(∑ kg AI)/ha	Halberg (2005)
	Consumption of pesticides	Regional, Farm	kg ()/ha	IRENA (2004)
	Organic fertiliser input	Farm	kg OM ha	AE-FOOTPRINT (2005)
	Direct usage data per pesticide	Farm, Regional		ELISA (2002)
soil quality	Soil quality (Topsoil (0-30cm) organic carbon content)	Regional, Farm		IRENA (2004)
	Organic matter in surface soil	Regional, Farm		DIS4ME (2005) PAIS (2001)
	Total estimates of organic carbon content in arable land		Mega tons	NewCMEF
	Mean organic carbon content		$g\ kg^{-1}$	NewCMEF
	Organic carbon content standard deviation		$g\ kg^{-1}$	NewCMEF
	Soil compaction	Farm, Regional	ha	ELISA (2002)
	Soil crusting	Regional, Farm		DIS4ME (2005)
	Rainfall-runoff relationship	Regional, Farm		DIS4ME (2005)
soil erosion	Soil erosion	Regional, Farm		IRENA (2004)
	Soil erosion (measured)	Regional, Farm		DIS4ME (2005)
	Soil erosion (USLE)	Sub-regional	T/ha·year	DIS4ME (2005)

	Mean estimated rate of soil loss by water erosion		tonnes/ha/year	NewCMEF
	Estimated agricultural area affected by moderate to severe water erosion (>11 t/ha/yr)		1000 ha at national level, ha at regional level	NewCMEF
	Share of estimated agricultural area affected by moderate to severe water erosion (>11 t/ha/yr)		%	NewCMEF
	Erosion risk (RDI)	Regional, Farm	Tonnes Ha	DIS4ME (2005)
	Soil loss index	Regional, Farm		DIS4ME (2005)
	Erosion protection	Regional, Farm	A relative value assigned to different classes of vegetation cover.	DIS4ME (2005)
	Soil erosion control measures	Regional, Farm	%	DIS4ME (2005)
	Soil water conservation measures	Regional, Farm	%	DIS4ME (2005)
soil treatment	Reclamation of affected soils	Regional, Farm		DIS4ME (2005)
	Reclamation of mining areas	Regional, Farm		DIS4ME (2005)
	Use of sewage sludge	Regional, Farm		IRENA (2004)
	Recycled Waste, Percentage of solid waste recycled. The volume of waste which is recycled based on the volume actually generated at source per capita.	Regional, Farm	% Percentage of solid waste recycled (m^3 per farm, % of disposal type)	DIS4ME (2005)
	Cropping methods (soil cover and tillage methods)	Regional, Farm		IRENA (2004)
	Tillage depth	Regional, Farm	cm	DIS4ME (2005)
	Tillage direction	Regional, Farm	Direction	DIS4ME (2005)
	Tillage intensity	Farm, Regional	number	PAIS (2001)
	Tillage operations	Regional, Farm	number	DIS4ME (2005)
	Direct drilling	Farm, Regional	yes/no	PAIS (2001)
	Irrigation technique	Farm, Regional	index	PAIS (2001)
fires	Fire Frequency	Regional, Farm	Number of fires per year on the surface unit of a defined territory, registered over a long period	DIS4ME (2005)
	Fire Protection	Regional, Farm	%	DIS4ME (2005)
	Fire Risk	Regional, Farm	A relative value assigned to different classes of vegetation cover (fire risk cannot be quantified in a simple manner, but it can be estimated on the basis of the flammability of the species present and the structure of the vegetation).	DIS4ME (2005)
	Burned Area	Regional, Farm	ha	DIS4ME (2005)

Table C6 Indicators for Landscape

	Indicator	Spatial Scale	Unit of Measure	Source
land use and land cover	Area of grassland	Farm, Regional	ha	PAIS (2001)
	Area of matorral	Regional, Farm	%	DIS4ME (2005)
	Area of Scrubs	Farm, Regional	ha	PAIS (2001)
	Area of Wetlands	Farm, Regional	ha	PAIS (2001)
	Mean size of arable fields	Farm	ha	AE-FOOTPRINT (2005)
	Area of hillslope cultivated	Regional, Farm		DIS4ME (2005)
	Area of marginal soil used	Regional, Farm	Ha (also % of total cultivated area)	DIS4ME (2005)
	Land abandoned from agriculture	Regional, Farm	Ha/unit of time	DIS4ME (2005)
	Deforested area	Regional, Farm	%	DIS4ME (2005)
	Afforestation rate	Farm, Regional	Ha/unit of time	PAIS (2001)
	Share of agricultural area managed by farms with low/medium/high input intensity per hectare		% of total UAA	NewCMEF
	Area under specific farming or management practices aiming at landscape conservation (traditional agricultural land use practices): Extensive grassland management schemes	Farm, Regional	ha	PAIS (2001)
	Area under specific farming or management practices aiming at landscape conservation (traditional agricultural land use practices): Alpine meadows	Farm, Regional	ha	PAIS (2001)
	Area under specific farming or management practices aiming at landscape conservation (traditional agricultural land use practices):Orchards	Farm, Regional	ha	PAIS (2001)
	Share of UAA with livestock density <1 LU/ha of forage area		ha and % of total UAA	NewCMEF
	Grazing area	Regional, Farm	%	DIS4ME (2005)
	Grazing control	Regional, Farm	Stocking rate vs grazing capacity, both expressed in Sheep Equivalents/ha/year (SE/ha/yr)	DIS4ME (2005)
	Grazing intensity, Grazing intensity in a silvo-pastoral environment is defined as a value included between 0 and 1, obtained as r2 relative to a direct correlation between the level of vegetation cover (%) and the livestock load (animal heads/ha per year) The value represents the contribution of grazing to the level of pressure vegetation is subjected to.	Regional, Farm	A-dimensional, values between 0 and 1.	DIS4ME (2005)
	Stock and change of Used Agricultural Area	Farm, Regional	ha, ha/unit of time	PAIS (2001)
	Stock and change of semi-natural and natural land	Farm, Regional	ha, ha/unit of time	PAIS (2001)
	Soil cover by crops	Farm, Regional	ha	PAIS (2001)
	Soil cover by stubble and mulch	Farm, Regional	ha	PAIS (2001)
	Land cover change	Regional, Farm		IRENA (2004)
	Land use change	Regional, Farm		IRENA (2004)
	Period of existing land use type	Regional, Farm	years	DIS4ME (2005)
	Conversion rate	Farm, Regional	Ha/unit of time	PAIS (2001)
	Crop diversity	Farm, Regional	ha	PAIS (2001)
	Natural vegetation	Regional, Farm	ha	DIS4ME (2005)
	Heterogeneity Index (HIX)	Farm, Regional	Index	PAIS (2001)

	Shannon Diversity Index	Farm, Regional	Index	PAIS (2001)
	Spatial complexity	Farm, Regional	Index	ELISA (2002)
	Land recognised for its scenic or scientific value	Farm, Regional	Index	ELISA (2002)
	Openness versus closeness	Farm, Regional	Index	ELISA (2002)
	Patch Shape of agricultural parcels	Farm, Regional	%, ha	PAIS (2001)
	Fragmentation of land parcels	Regional, Farm	Hectares, Ratio between Utilised Agricultural Area (UAA) and Number of parcels per holdings	DIS4ME (2005)
	Forest fragmentation	Regional, Farm	%	DIS4ME (2005)
	Used Agricultural Area (UAA) within protected sites (according to IUCN categories)	Farm, Regional	ha	PAIS (2001)
	% territory under Natura 2000's Special Protection Areas (SPAs)		%	NewCMEF
	% territory under Natura 2000's Sites of Community Importance (SCIs)		%	NewCMEF
	% territory under Natura 2000's network		%	NewCMEF
	% UAA under Natura 2000		%	NewCMEF
	% forest area under Natura 2000		%	NewCMEF
	Share of forest and other wooded land (FOWL) protected to conserve biodiversity, landscapes and specific natural elements according to MCPFE Assessment Guidelines (MCPFE class 1.1, 1.2, 1.3 and 2)			
	No active intervention		1000 ha and % of FOWL area protected	NewCMEF
	Minimum intervention		1000 ha and % of FOWL area protected	NewCMEF
	Conservation through active management		1000 ha and % of FOWL area protected	NewCMEF
	Protection of landscapes and specific natural elements		1000 ha and % of FOWL area protected	NewCMEF
	Field margin cultivation	Farm, Regional	yes/no, ha, m	PAIS (2001)
	Length conservation field margins	Farm	m	AE-FOOTPRINT (2005)
	Length and distribution of different edges	Farm, Regional	m	PAIS (2001)
	Length of field boundaries	Farm	m/ha	AE-FOOTPRINT (2005)
	Proportion of boundaries managed with field margins	Farm	%	AE-FOOTPRINT (2005)
	Length of "green" linear landscape features maintained and/or restored by farmers: Grass margins in arable field	Farm, Regional	m	PAIS (2001)
	Stock and Change of linear habitats and biotopes in agricultural landscapes (Saumbiotope): Grass margins	Farm, Regional	m, m/unit of time	PAIS (2001)
	Proportion of watercourse length protected by buffer strips	Farm	%	AE-FOOTPRINT (2005)
	Length aquatic buffer zones, (e.g. streamside vegetated margins)	Farm	m	AE-FOOTPRINT (2005) PAIS (2001)
	Length of "green" linear landscape features maintained and/or restored by farmers: Transhumance tracks	Farm, Regional	m	PAIS (2001)
	Length of traditional linear landscape features, m (e.g. hedges, terraces, country lanes, stone walls)	Farm	m	AE-FOOTPRINT (2005)
	Hedgerow cultivation	Farm, Regional	yes/no, ha, m	PAIS (2001)
	Proportion of hedgerow managed for wildlife	Farm	%	AE-FOOTPRINT (2005)
	Length of hedgerow	Farm	m/ha	AE-FOOTPRINT (2005)

	Proportion of terraced land	Farm	%	AE-FOOTPRINT (2005)
	Terraces (presence of)	Regional, Farm	%	DIS4ME (2005)
	Stock and change of historical – cultural landscape linear features: Terraces	Farm, Regional	m, m/unit of time	PAIS (2001)
	Stock and change of historical – cultural landscape linear features: Stone walls	Farm, Regional	m, m/unit of time	PAIS (2001)
	Stock and change of historical – cultural landscape linear features: Ancient roads	Farm, Regional	m, m/unit of time	PAIS (2001)
	Stock and change of historical – cultural landscape area features: Historical agricultural parcel pattern	Farm, Regional	ha, ha/unit of time	PAIS (2001)
	Stock and change of historical – cultural landscape point features	Farm, Regional	number, ha, m	PAIS (2001)
	Number of archaeological and/or historical features per farm	Farm	ha	AE-FOOTPRINT (2005)
	Adequateness of key cultural features	Farm, Regional	Index	ELISA (2002)
biotopes	High nature value (farmland) areas (share of the Utilised Agricultural Area that is estimated to be High Nature Value farmland)	Regional, Farm		IRENA (2004)
	Biodiversity conservation	Regional, Farm	Number of species (or selected taxa) and their variations.	DIS4ME (2005)
	Conservation status of grassland		Area in km² and % of total assessments of habitats	NewCMEF
	Important Bird Areas affected by agricultural intensification and abandonment	Regional, Farm		IRENA (2004)
	Size/% of characteristic habitat types	Farm, Regional	ha, %	ELISA (2002)
	Number of habitats per farm	Farm	number	AE-FOOTPRINT (2005)
	Area of crop habitat suited to species conservation	Farm	ha	AE-FOOTPRINT (2005)
	Proportion of farm area that is non-agricultural semi-natural habitat	Farm	%	AE-FOOTPRINT (2005)
	Corridors and linkages between habitat types	Farm, Regional	number, ha	ELISA (2002)
	Stock and change of valuable biotopes and habitats in agricultural landscapes (area features) managed by farmers in: Extensive managed grassland areas	Farm, Regional	ha, ha/unit of time	PAIS (2001)
	Stock and change of valuable biotopes and habitats in agricultural landscapes (area features) managed by farmers in: Old olive groves	Farm, Regional	ha, ha/unit of time	PAIS (2001)
	Stock and change of valuable biotopes and habitats in agricultural landscapes (area features) managed by farmers in: Traditionally managed orchards	Farm, Regional	ha, ha/unit of time	PAIS (2001)
	Stock and Change of linear habitats and biotopes in agricultural landscapes (Saumbiotope): Woodland margins	Farm, Regional	m, m/unit of time	PAIS (2001)
	Stock and Change of point habitats and biotopes in agricultural landscapes	Farm, Regional	number, ha, m	PAIS (2001)
anthropogenic features	Stock and change of present anthropogenic landscape area features: Urban sprawl	Farm, Regional	ha, ha/unit of time	PAIS (2001)

	Stock and change of present anthropogenic landscape linear features: Traffic infrastructure	Farm, Regional	m, m/unit of time	PAIS (2001)
	Stock and change of present anthropogenic landscape point features: Wind turbines	Farm, Regional	number, ha, m	PAIS (2001)
fires	Burned Area	Regional, Farm	ha	DIS4ME (2005)
	Fire Frequency	Regional, Farm	Number of fires per year on the surface unit of a defined territory, registered over a long period	DIS4ME (2005)
	Fire Protection	Regional, Farm	%	DIS4ME (2005)
	Fire Risk	Regional, Farm	A relative value assigned to different classes of vegetation cover (fire risk cannot be quantified in a simple manner, but it can be estimated on the basis of the flammability of the species present and the structure of the vegetation).	DIS4ME (2005)
soil quality	Soil compaction	Farm, Regional	ha	ELISA (2002)
	Soil crusting	Regional, Farm		DIS4ME (2005)
	Rainfall-runoff relationship	Regional, Farm		DIS4ME (2005)
	Type and capacity of storage for farm manure and slurry	Regional, Farm		IRENA (2004)
	Estimated agricultural area affected by moderate to severe water erosion (>11 t/ha/yr)		1000 ha at national level, ha at regional level	NewCMEF
	Share of estimated agricultural area affected by moderate to severe water erosion (>11 t/ha/yr)		%	NewCMEF
soil treatment	Cropping methods (soil cover and tillage methods)	Regional, Farm		IRENA (2004)
	Tillage direction	Regional, Farm	Direction	DIS4ME (2005)
	Tillage intensity	Farm, Regional	number	PAIS (2001)
	Tillage operations	Regional, Farm	number	DIS4ME (2005)
	Reclamation of affected soils	Regional, Farm		DIS4ME (2005)
	Reclamation of mining areas	Regional, Farm		DIS4ME (2005)
	Drainage density	Regional, Farm	A measure of the length of stream channel per unit area of drainage basin	DIS4ME (2005)
	Drainage type	Regional, Farm		DIS4ME (2005)
	Direct drilling	Farm, Regional	yes/no	PAIS (2001)

Table C7 Indicators for Animal Welfare

	Indicator	Spatial Scale	Unit of Measure	Source
land use	Grazing area	Regional, Farm	%	DIS4ME (2005)
	Grazing control	Regional, Farm	Stocking rate vs grazing capacity, both expressed in Sheep Equivalents/ha/year (SE/ha/yr)	DIS4ME (2005)
	Grazing intensity, Grazing intensity in a silvo-pastoral environment is defined as a value included between 0 and 1, obtained as r2 relative to a direct correlation between the level of vegetation cover (%) and the livestock load (animal heads/ha per year) The value represents the contribution of grazing to the level of pressure vegetation is subjected to.	Regional, Farm	A-dimensional, values between 0 and 1.	DIS4ME (2005)
	Share of UAA with livestock density <1 LU/ha of forage area		ha and % of total UAA	NewCMEF
genetic diversity	Genetic diversity	Regional, Farm		IRENA (2004)
	Genetic diversity in farm species	Farm, Regional	Index	ELISA (2002)
	Genetic diversity in semi-natural agro-ecosytems	Farm, Regional	Index	ELISA (2002)
	Livestock genetic diversity	Farm	index	AE-FOOTPRINT (2005)
	Number of traditional breeds/cultivars	Farm	number	AE-FOOTPRINT (2005)
food quality schemes	Hazard Analysis and Critical Control Point (HACCP) analysis	Farm	Model	Berends, B.R. (1996)
	Evidence of frequent Safety and Quality audit by certified auditors	Farm	Yes/No	AE-FOOTPRINT (2005)
	Contaminated feed	Farm, Regional	Yes/No	Berends, B.R. (1996)
	Level of feed contamination	Farm, Regional		Berends, B.R. (1996)
	A positive Salmonella-status of animals before transport	Farm, Regional	Yes/No	Berends, B.R. (1996)
	Raw Milk Bacteria Levels - Bacillus spp.	Farm		Hutchison, M.L (2005)
	Raw Milk Bacteria Levels - coliforms	Farm		Hutchison, M.L (2005)
	Raw Milk Bacteria Levels - Escherichia coli	Farm		Hutchison, M.L (2005)
	Raw Milk Bacteria Levels - Pseudomonas spp.	Farm		Hutchison, M.L (2005)
	Raw Milk Bacteria Levels -Bifidobacteria spp.	Farm		Hutchison, M.L (2005)
	The use of broad spectrum antibiotics	Farm, Regional	Yes/No, Scale	Berends, B.R. (1996)
	The lack of transport hygiene	Farm, Regional	Yes/No	Berends, B.R. (1996)
	Transport stress	Farm, Regional	Scale, Yes/No	Berends, B.R. (1996)
	Water quality	Regional, Farm	Specific electrical conductance (dS/m, mmol/L)	DIS4ME (2005)
farming management	Type and capacity of storage for farm manure and slurry	Regional, Farm		IRENA (2004)
	Quality of livestock housing	Farm	Index	AE-FOOTPRINT (2005)