

Land cover, land use and landscape agri-environmental indicators developed during the IRENA Operation on the basis of IMAGE 2000 and CORINE Land Cover

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ABSTRACT

The presentation provides an overview of the IRENA Operation and its political context, the general analytical approach and evaluation of agri-environmental indicators at the European scale, and how land cover, land use and landscape indicators were derived from IMAGE 2000 and CORINE Land Cover.

The European Councils in Cardiff (June 1998) and Vienna (December 1998) stressed the importance of developing environmental indicators to assess the impact of different economic sectors on the environment – including agriculture – and to monitor progress in integrating environmental concerns into Community policies. The European Council in Helsinki (December 1999) adopted the strategy for integrating the environmental dimension into the CAP, previously endorsed by the Agricultural Council (Agricultural Council, 1999). This strategy included a commitment to develop appropriate agri-environmental indicators to monitor such integration. Following this request the Commission issued two communications: COM (2000) 20, which defines the objectives for monitoring the integration process and identifies a set of agri-environmental indicators, and COM (2001) 144, which identifies concepts and potential data sources.

The IRENA Operation (Indicator Reporting on the Integration of Environmental Concerns into Agriculture Policy) was launched to further develop agri-environmental indicators for monitoring the integration of environmental concerns into the Common Agricultural Policy (CAP). It is a joint exercise between DG Agriculture and Rural Development, DG Environment, Eurostat and DG Joint Research Centre, and the European Environment Agency (EEA). The starting point of work in the IRENA Operation was the set of 35 indicators/indicator domains defined in COM (2000) 20 and the assessments made by COM (2001) 144 concerning their state of development and required further work.

The surface area devoted to agriculture is shrinking gradually in Europe, mainly due to afforestation and urbanisation. CORINE Land Cover (CLC) 1990 and 2000, derived from satellite images and ancillary data, represent the only European-wide databases that can be used to identify changes from agriculture to artificial surfaces and changes within agriculture.

The IRENA land use change indicator shows the area of land use change from agriculture to artificial surfaces, expressed in absolute terms (hectares) or as a percentage of the agricultural area in 1990. The impact of increased land development activities for the agricultural sector is the socio-economic consequences of greater competition for land between agriculture and other sectors (e.g. urban, industry, commerce, and tourism), resulting in higher land prices and more restricted access to land. The environmental relevance of land developments in agricultural areas is the effects of soil sealing on the landscape and nature (e.g. restriction of animal movement, loss of biodiversity, increased water runoff and changes to agricultural landscapes). During 1990 to 2000, the change in land use from agriculture to artificial surfaces ranged from 2.9% in the

Netherlands to 0.3% in France. In general the highest percentage of agricultural land (in 1990) converted to artificial surfaces (by 2000) occurred in urban and coastal regions.

The IRENA land cover change indicator analyses the entries and exits to and from agricultural and forest/'semi-natural' land as well as the land cover changes within agriculture (net arable and pasture area changes). The expansion of forest and semi-natural land areas onto agricultural land occurs where there is abandonment of agricultural land, the introduction of agro-forestry, expansion of forest plantations, or expansion of nature conservation schemes. There are important land cover changes to and from forest/semi-natural and agricultural land in Spain, Portugal, and Italy, whereas land cover changes are relatively small in the Netherlands, Belgium, France, Ireland, Germany, Luxembourg, and Denmark.

The IRENA landscape indicator utilises landscape metrics, such as the patch density and the number of agricultural classes, derived from rasterised CORINE Land Cover. These are calculated for case study agricultural landscape regions across EU-15.