

# **New Elements for Harmonised Approaches on Land Cover/Land Use Information Systems**

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**ABSTRACT:** Information on land cover and land use is a major international concern. Policymakers at all levels of government need access to both spatial and statistical information on land cover and land use for environment, agriculture, forestry, urban areas or regional planning, and rural development. A review of initiatives undertaken to meet these needs in Europe and elsewhere is presented.

## **1. Context**

### *Increasing Needs and New Needs*

Information on land cover and land use is a constant concern within the European Union. The management of various policies at Union, national or local levels for environment, agriculture, forestry, urban areas or regional planning needs access to both spatial and statistical information on land cover/land use at different geographic scales. Moreover, pluri-thematic information is required in the context of the new Common Agricultural Policy (CAP), which has an impact on land cover, land use and landscape structures, for questions concerning rural development, integration of environmental goals into the CAP and the development of the role of farmers in terms of natural resources and landscape conservation. We also must take into account the environmental impact of regional planning policies and the dynamics of urban areas.

### *Variable and Incomplete Answers*

These needs have led to a continued reappraisal of the corresponding information systems. Several information systems on land cover/land use co-exist within Europe but do not always match the requirements of users, particularly when a new kind of information is required. Different reasons may be found: (i) programmatic approaches lead to the development of one-purpose systems, (ii) concepts are often not clear (for example, differences between land cover and land use, confusion between nomenclatures and map legends), (iii) problems of scale and observation units are difficult, or (iv) systems are adapted to data collection tools. Other areas of difficulty to be noted are legal copyrights, prices, technical problems of access and dissemination of information.

## *Harmonisation Required*

The multiplicity of existing initiatives at various levels requires a general reflection on harmonisation and on the necessity to propose general and modular solutions which take into account the various needs of users. This requires a special effort of coordination among data producers. In addition, the wish both to reduce acquisition and processing costs on the one hand and to allow a maximum use of land cover/land use information on the other, implies co-ordination between users and data producers.

## **2. Existing Initiatives**

### *2.1 At the European Level*

Within Europe, different programs or projects deal with land cover/land use information systems:

- at the European level, there is the CORINE Land Cover program (aiming at providing information for environmental purposes at medium scales), the UN-ECE system of land use statistics; and land use statistics compiled by Eurostat, the Statistical Office of the European Communities;
- at the national level, some countries have operational information systems: TER-UTI in France, ATKIS in Germany, Land Use Stock Survey in the United Kingdom, Land Use statistics in Switzerland; and
- at regional (i.e. infra-national) and local levels, various systems have been developed.

Apart from these programs, various initiatives have been launched with the aim to improve and gain understanding in issues linked to *harmonisation*.

#### *2.1.1 EEA's European Topic Centre Land Cover*

The European Environmental Agency (EEA) has established a European Topic Centre on land cover (ETC/LC) in 1995, led by the Environmental Satellite data Centre of Sweden. The strategy for the ETC/LC is to provide users of land cover data, in a European perspective, with accurate data that correspond to needs in a wide range of environmental applications. The ETC/LC works as a consortium between 16 different organizations all over Europe. The CORINE databases, in particular the Corine Land-Cover database, have been taken over by the EEA and are managed by the ETC/LC GISCO. The Geographic Information System of the European Commission located at Eurostat has a copy for Commission internal use. Mapping of most of the Union has been achieved. Eastern and Central European countries are also being covered.

#### *2.1.2 JRC Activities*

The Joint Research Centre of the European Commission (JRC) in Ispra, Italy, is in charge of the MARS (Monitoring Agriculture Through Remote Sensing) project aiming at developing methods for improving agricultural statistics. The MARS project provides a means of monitoring up-to-date agricultural statistics, changes over time, and allows estimates at the European level through real-time evaluation of land cover changes in the sample units on 60 sites. Other relevant initiatives are based on Corine land cover databases where two projects have been started: one on coastal zones, one on urban zones. JRC has also developed a methodology for updating Corine results.

### *2.1.3 DGXII Activities under the 4th Framework Programme of Research and Development*

DGXII (Directorate General: Science, Research and Development of the European Commission) is funding two concerted actions in the field of land cover/land use harmonisation issues. The first one, CLAUDE, led by University College (London), aims at developing a Europe-wide land use/land cover change monitoring and research plan and to improve links with international efforts in this field. The second one, LANES, led by CESD-Communautaire in Luxembourg aims at better understanding the components of land cover/land use information systems and at determining procedures or standards to improve compatibility between systems.

### *2.1.4 Eurostat Working Group on Land Use Statistics*

The Agricultural Statistics Committee (where Eurostat meets with the member states) decided to reactivate a specific Working party on “Land use Statistics” to consolidate work in the field of land use statistics. The first meetings with Member-states were dedicated to understanding Commission requirements in terms of land cover/land use information, to make an inventory of existing systems at the national level and to improving harmonisation through pragmatic work (for example, on nomenclatures).

## *2.2 At the International Level*

At the international level, one should mention initiatives taken by UN agencies: FAO and UNEP organized an expert meeting in Geneva in 1994 on the problems of harmonizing land cover and land use classifications. FAO launched the AFRICOVER project whose goal is to establish a digital georeferenced database on land cover and a geographic referential at 1,250,000 scale (1,100,000 for small countries). FAO developed a new classification scheme based on the designing of independent diagnostic attributes called classifiers.

The work of the joint IGBP/IHDP (International Geosphere Biosphere/International Human Dimensions Programme) Land Use and Cover Change (LUCC) research project should also be mentioned.

## **3. Towards Harmonization at the European Level**

### *3.1 Creation of an Inter-Service Group at the European Commission Level*

Considering the need of coordination among these various initiatives, at least in Europe, it was decided at the initiative of Eurostat to create at Commission level an inter-service group on land use. Various general directorates of the European Commission are participating in this inter-service group in order to design common approaches for future multi-purpose information systems on land cover and land use answering information requirements of the Commission. The decision to organise an international seminar on land use in January 1998 in Luxembourg stemmed from the work of the inter-service group.

### *3.2 Organisation of a Land Use International Seminar January 1998*

Eurostat hosted in January 1998 a seminar with the following objectives:

- to take stock of the requirements of the European Commission in terms of land cover and land use information for conducting Community policies,
- to compare the different approaches which exist to meet these requirements, and
- together with the Member states, to draw general lines or points of convergence so as to improve the harmonization of approaches and responses in terms of information systems.

### *3.3 Mandate and Work-Programme of a Steering Committee on Land Cover/Use at the European Level*

One of the main conclusions of the seminar was to create a Steering committee at the European level for strengthening coordination of various activities initiated under the European Commission umbrella in the field of land cover and land use. An institutional group has been proposed with the three most important actors in the field: Eurostat, the Joint Research Centre and the European Environmental Agency. Its mandate will be to foster common initiatives at the European level and strengthen links both with member states and international organizations in this field. Among short-term activities proposed, it has been decided to prepare a technical paper on main concepts and methodologies as well as a guide of “Best practice” for implementing and conducting a land cover/land use information system.