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Newsletter

HLanData

HARMONIZATION OF EUROPEAN
LAND USE AND LAND COVER DATABASES
FOR THE CREATION OF VALUE ADDED SERVICES

Special Issue
HLanData Pilot Projects

Pilot 1: Land Use and Land Cover Data Analysis System for Intermediate-Level Users

The main **objective of PILOT 1** is to demonstrate the practical usability of the common harmonized networking infrastructure of Land Cover and Land Use geographical information through the provision of some valued added services.

Targeted end users are mainly public or private institutions from European, national and regional administrations. This thematic data is considered essential or very important for their work, often combined with other thematic data to produce spatial analysis and derived information (statistics, indicators, report, maps, etc.).

Moreover, there is a strong need for harmonized nomenclature and data model when considering Land Cover and Land Use information. It's also required to provide users with easy access and friendly use of these data.

Thanks to this Pilot project a system of advanced analysis and exploitation of the harmonized Land Use and Land Cover data has been developed.

Furthermore, it makes available information from different years and fulfils users' demands when using data and services, which are visualization, identification, overlaying and download.

The Data Providers and the "architects" of this Pilot 1 project are **Spain** and **Latvia**. A total of four partners are involved in the Pilot 1: Government of Navarre (ES) as Project Leader, TRACASA (ES) as Technical provider and Project Technical coordinator, IGN/CNIG (ES) and TDF (LV) both as providing data and services.

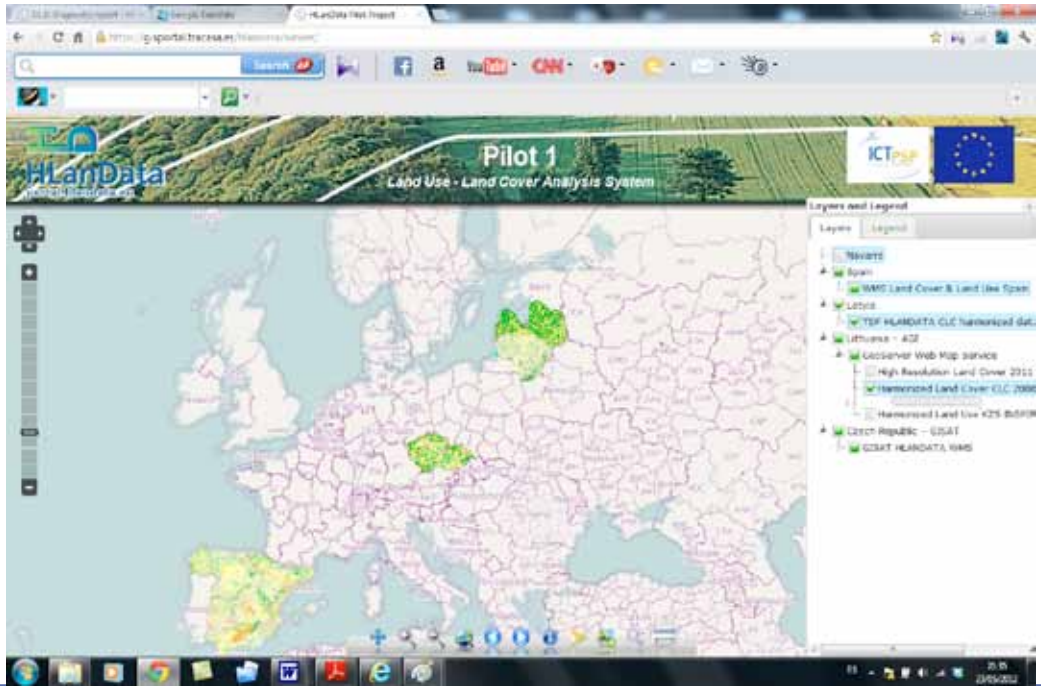
The value-added service is a **specialized web-based map application** that allows users access and functionality for performing selected operations to obtain useful information by using harmonized LU/LC data. In most cases, this functionality is provided by using standardized web services (e.g. OGC – WMS, WFS, WPS) and standardized IT protocols and formats (REST, JSON, …).

The basic components of Pilot 1 are three: a "**geographic window**", a "**box layer and legend**" and a "**toolbar**" that contains several operating buttons offering all functionalities.

The *geographic window* is in the central view, maximizing to most of the screen.

The *layer and legend* box contains geographic information layers where metadata can be consulted and the data downloaded. The content of each active layer is available in the *Legend tab*.

Fig 1: Pilot 1 geographic window, box layer and toolbar
https://gisportal.tracasa.es/hlandata/viewer/



The *toolbar* offers: Advanced visualization tools, Overlaying of layers using transparencies and defining scales, Measure areas and distances, Labelling, Spatial and temporal analysis, Access to WMS services, Advanced queries: WFS services, Printing.

Additionally, the application allows downloading in different formats and the final map can be printed with resolution, title and comments previously added with the print tool.

An **e-learning tool** platform is considered essential to the management of this map application website.
The main goal of this platform is to provide users with a friendly and useful tool where to make available the **user guide** and its application presented as practical **use cases**.
The e-learning platform is concived to obtain feedback from users and to improve the results of this european project.

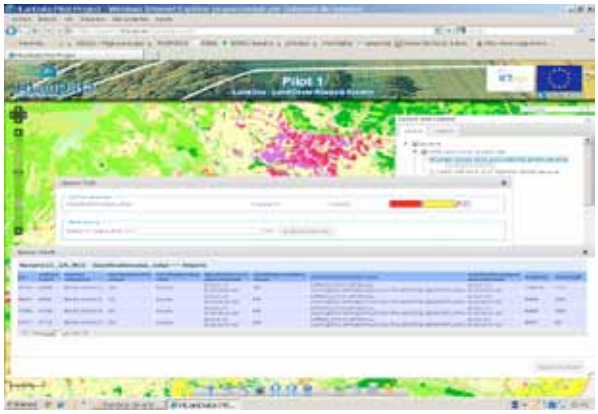


Fig 2: Query toolbar

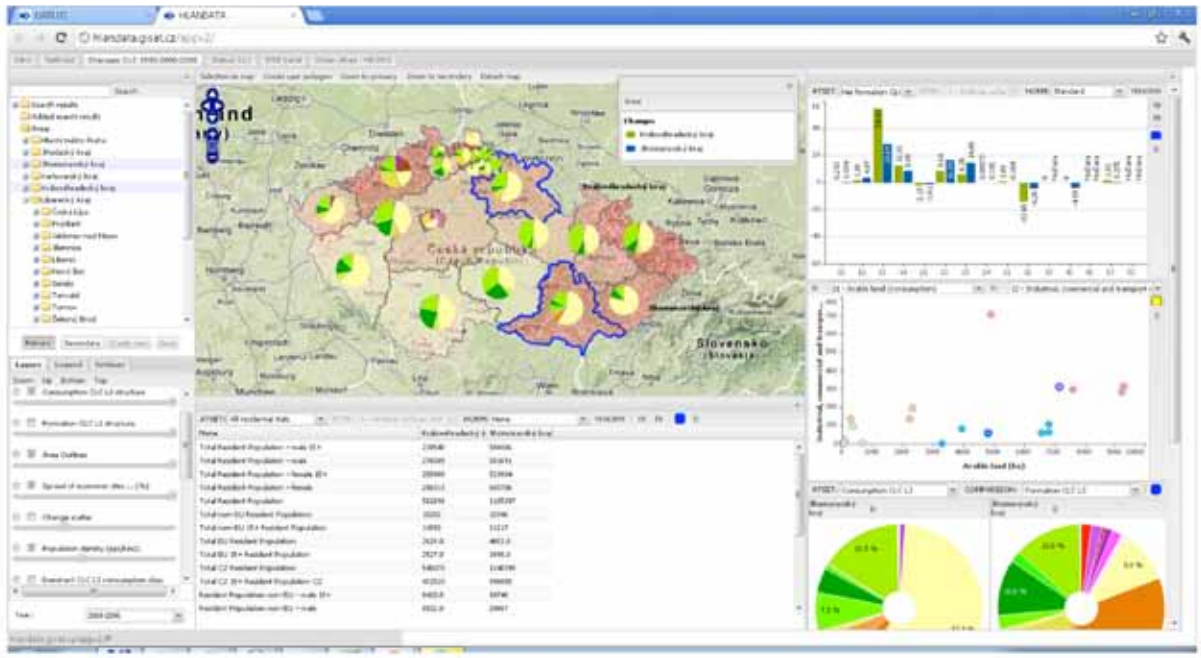
Pilot 2.1: National Land Information System

In the frame of the HLANDATA project, GISAT supported by CENIA, jointly serving as the EEA National Reference for Spatial Analysis and Land Cover in the Czech Republic, work on Pilot 2.1 service exploring the potential of the setup of a national land information system and implementation of its trial demonstrator.

The pilot focuses mainly on technical, but reflects also organizational support required to set up data sharing cycle of the national mandated actors and data providers of partial land cover and land use data; this is done in a harmonized way to support access to adequate and comprehensive data for interdisciplinary and holistic analysis and planning activities.

The pilot aims to explore potential on how to turn land cover / land use data into standard information and provide user-friendly tools to

Fig 1: The Webtool Interface



explore, describe, compare and explain land cover and land use changes in socio-economic context. In order to achieve this level of flexibility and usefulness required by users, the service specification for the Pilot 2 goes far beyond the traditional concept of data provision.

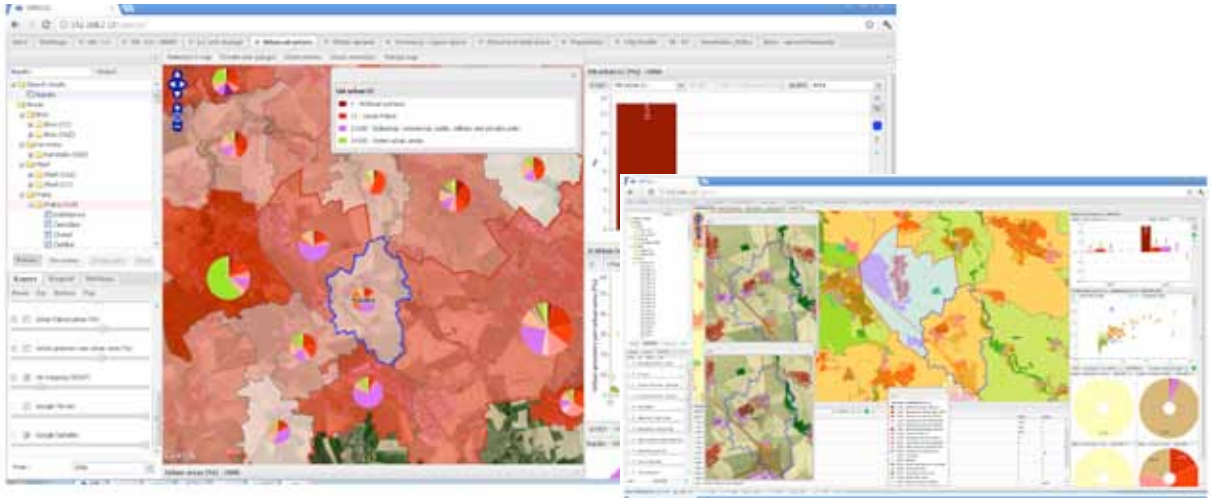
Inspired by the European Environmental Agency (EEA)'s the Land and Ecosystem Accounting framework (LEAC), the Pilot 2.1 is based on an interactive web-based approach, where both spatial and socio-economical statistical data are delivered in an organized way, together with tools, in a fast and flexible environment. This allows data to be easily viewed and analyzed in user-predefined themes (indicator views), as well as being further explored interactively.

The webtool, based strictly on Open Source frameworks, integrates main standard presentation modes - maps, tables and graphs in an interlinked manner i.e. user-defined changes in/via one presentation mode are instantly reflected in all the others. User is also free to choose the most appropriate level of granularity for his analysis or define his own analytical units. Analytical views on data can be stored (using OpenID authentification) and/or shared with other users using simple URL link. Finally, users can export of each webtool component (into PDF or images) to be used in user reports or assessments.

The web-based approach to this Pilot demonstrator shows not only potential of harmonised land cover / land use data, but also the power of new technological solutions to support the complex spatial information provision to the end-user. Intuitive, fast and user-friendly exploration and analysis webtool handling large spatial datasets integrated with traditional socio-economic statistical data can provide effective support to spatial planning on various administration levels and assure sharing the land knowledge on decision making level as well as further stimulate general public involvement.

Link to Pilot Webpage: http://hlandata.gisat.cz/appv2

Fig 2 and 3: Examples of the HLANDATA Pilots 2.1 – webtool interface



Pilot 2.2: Statistical land information system based on high resolution land cover data

The main purpose of HLanData Pilot 2.2 implemented by Institute of Aerial Geodesy (AGI) is development of on-line statistical analysis system for comparison of various land cover datasets within different administrative units and natural regions, which is open for testing at http://hlandata.agi.lt. The pilot area covers Mūša/Lielupe river basin stretching over northern Lithuania and central Latvia, but it should be extended over both countries during the follow-up phase of the project.

Web application based on open-source software is designed to be very simple, yet be efficient in interactive web mapping and statistical land cover analyses at different scales and thematics, such as national, regional (municipality) or local (commune) administrative units, NATURA2000 protected areas or WFD river basins. Land cover statistics and summary of land cover change is calculated automatically from CORINE Land Cover 2000 and 2006 datasets. Some users would like to see the whole range of historical change in land cover over the last 15 years, so we plan to include CLC 1995 dataset into the analysis as well. CLC 2009 and 2012 datasets will be perfect

Fig 1: Webtool Interface of Pilot 2.2

candidates to complete the information system as soon as their production is complete.

One of the most important aspects of Pilot 2.2 is development of an original technology and development of a large sample of so-called High Resolution Land Cover (HRLC) database, which was intended to become the first GMES downstream service in Lithuania and replace CORINE Land Cover in national surveys, reporting and applications. The technology of HRLC database is based on very high resolution satellite imagery and object-based classification method, currently used in some other EC-funded RTD projects (such as Geoland2). AGI team developed a completely new classification algorithm, which allows to extract dominating land cover classes from RapidEye imagery fuzzed with panchromatic ortho-photo coverage with quarter-hectare minimum mapping units. National users pointed out the following land cover classes as top-priority for the HRLC database: built-up areas (with roads), bare ground (with sand dunes, quarries, etc.), water bodies, agricultural areas, coniferous, deciduous and mixed forests, transitional woodland (with abandoned fields and forest re-cultivation), natural grassland and wetlands. Currently the HRLC database covers Lithuanian part of the pilot area.

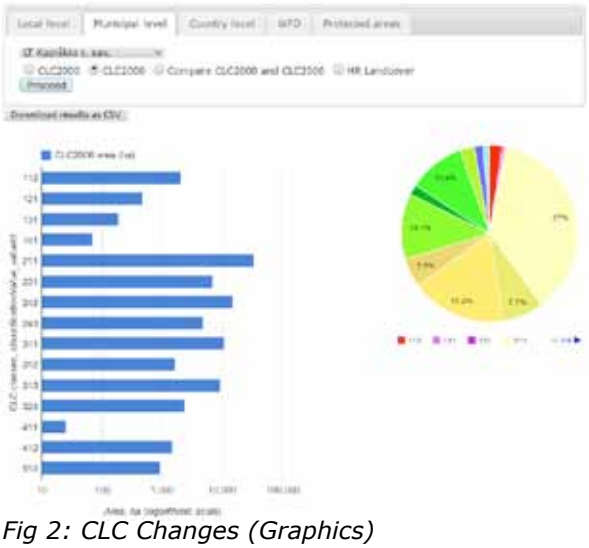


Fig 2: CLC Changes (Graphics)

Fig 3: Land Use changes (Table)

The long-term sustainability of the Statistical land information system developed by AGI requires not only efficient technologies and cost-effective production/maintenance services, but also active participation of institutional users and especially the major stakeholders responsible for land accounting and reporting on a national level.

The project team at AGI tries to promote the new service at the Ministries of Agriculture and Environment and their subordinate units, such as National Land Service, State Land Fund, Environment Protection Agency and State Protected Areas Service.

Link to Pilot Webpage: http://hlandata.agi.lt/

Fig 4: Land Use changes (Graphics)

Pilot 3: Stratification of waste dumps

The Pilot project in Slovakia aims to implement **specialized web based map application** focused on **Stratification of waste dumps in Slovakia** allowing selected operations as visualization, overlay and integration of different information from different sources adapted to the specific needs of LC/LU data users. Application integrates harmonized European data sets relevant to land cover and land use 'Themes', national waste management data and national sources of spatial data intended for the additional functionalities and analyses as protected areas, geological maps, urban atlas and vector map of Slovakia. Pilot project was developed fully in line with the INSPIRE principles. Harmonized data sets are stored in geodatabase and are shared via WMS. Thanks to the application the end users will be provided by concrete value added services that will allow support objective decision making process in the framework of waste management. The web based map application is mapping existing, forbidden and closed landfills and proposed zones for the new landfills.
Website dedicated to "Stratification of waste dumps", with all relevant public/ non public information, in both Slovak and English language is freely accessible through the web at: http://hlandata.sazp.sk. Authentication and access to the pilot application is available at: http://hlandata.sazp.sk/pilot. The pilot is fully operational and at this stage of development allows following functionalities: visualization of the layers to different scales, layers overlay, feature identify and feature edit. Future development will bring the implementation of multitemporal analysis (spatial, availability and cost/benefit analysis) on the basis of key layers like population, waste production, LC/LU, DTM, hydrology and environment protection.

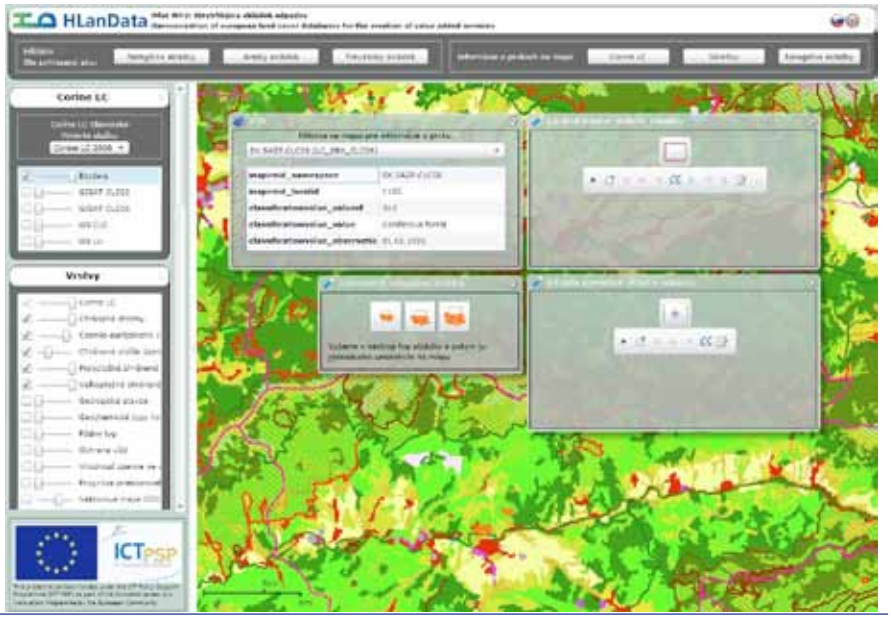


Fig 1: Stratification of waste dumps - Pilot project layout

www.hlandata.eu

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Report on Deliverable D3.3 published - Final Version of the implemented pilots including all value-added services and functionalities

The main objective of WP3 is the development and validation of the value-added services associated to the project. The starting point was the adaptation and optimization of the generic web services developed in WP2 to the concrete value-added services offered by the pilot projects. In each one of the pilot projects, these were extended with new web services and functionalities, allowing the validation of the proposed harmonization at a European level.

Task 3.1 was focused on the design of the pilot projects - to choose appropriate technologies, architecture and system concept. This choice was up to each stakeholder responsible for its pilot project - with respect to its needs and Pilot functionalities. This task was reported in Deliverable 3.1.

Task 3.2 comprises the development phase of the pilot projects to be implemented according to the previous design. During this task was produced Deliverable 3.2 report - describing the development phase of first partial version of the implemented Pilots. This Deliverable 3.3 report describes final version of the implemented pilots – including all value-added services and functionalities.

The report is available on the HlanData Website:

http:www.hlandata.eu/results.htm

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