

Information systems for monitoring land use planning in the Finnish Environmental Administration. GISALU (Land Use GIS) and KATSE (the Information System for Monitoring Land Use Planning).

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1 Abstract

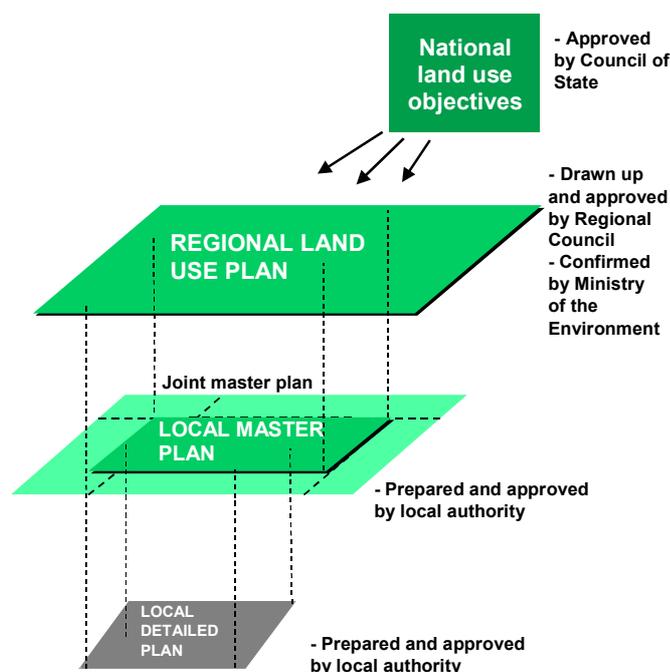
The primary aim of the monitoring of land use planning is to obtain information about the state and development of land use planning. The new Land Use and Building Act of Finland has obliged the authorities to monitor land use since the beginning of the year 2000. Two information systems help to fulfil this task in the Finnish Environmental Administration. GISALU (Land Use GIS) is a collection of data sets containing geographical data on land use plans, deviation decisions and the cultural environment. KATSE (the Information System for Monitoring Land Use Planning) mainly contains statistical data on the state of planning as a whole and changes in it. GISALU is an important information source for KATSE. Both information systems form part of ALUTJ (the information systems for land use), and they are also subsystems of HERTTA (the Finnish Environmental Information System).

2 Reform in FINLAND'S land use planning system

2.1 The new Land Use and Building Act

The spatial consequences of the changes that have taken place in Finland since the Second World War were managed by planning and building legislation dating from the late 1950's. This legislation was created as a framework for post-war reconstruction and new development. There are several reasons why this legislation had become outdated. Since the mid-1980's, new development has been planned mainly within the existing urban structure. The protection of nature has become an integral part of spatial planning and there was a need to improve public participation. (Rautsi 1999)

The new Land Use and Building Act came into force on 1 January 2000. The main aims of the new act are to create a sustainable basis for the development of communities, to improve public participation in area development, to delegate decision-making to local authorities, and to improve building quality. The Finnish land use planning system includes the municipal and regional levels - which are the local detailed plan, the local master plan, the joint municipal master plan, the regional land use plan - and the national land use objectives have been set by the Council of State (Graph 1). The overall guidance of land use and the siting of various activities take place locally by means of master plans. Municipalities may also decide on joint municipal master plans. National and regional goals will be expressed in regional plans prepared by 19 regional councils (alliances of municipalities). Municipal plans will no longer be approved by higher authorities, except for joint municipal master plans, which require the approval of the Ministry of the Environment. The government administration will safeguard the achievement of national goals and provide assistance to local authorities. Appeals against local land use decisions are directed to administrative courts. The regional plans are also to be submitted for the approval of the Ministry of the Environment. (Ministry of the Environment 15 April 2002)



Graph 1: The new system of land use plans (Ministry of the Environment 1999 B)

2.2 Monitoring land use planning

The Ministry of the Environment has been publishing annual reports on land use planning since the latter part of the 1970's. In the reform of land use planning the legislation included - for the first time - regulations concerning land use monitoring. Section 2 in the Land Use and Building Decree contains provisions on the duties of the government administration and local authorities:

“The Ministry of the Environment shall organize the monitoring of the state and development of land use and the built environment, and the maintenance of the necessary database.

“Within its territory, the regional environment centre promotes and steers the organization of monitoring the state and development of land use and the built environment and also contributes to organizing the necessary monitoring.

“Within their territories, regional councils shall see to monitoring of the state and development of land use, the regional and community structure, the built environment and the cultural and natural environment as required for regional planning and building.

“Within their territories, local authorities shall see to monitoring of the state and development of land use, building and the built environment and the cultural and natural environment as required for planning and building.”

The authorities' right to receive information is based on the Land Use and Building Act, Section 205: “The Ministry of the Environment and the regional environment centres are entitled to receive without charge from local authorities, regional councils and other authorities any information they possess that is needed for monitoring land use and the built environment, and any documents needed for the supervision and other duties of authorities laid down in this Act”. The information which the Environmental Administration is entitled to is provided in more detail by decree: “...includes information on land use and the state and development of the built environment, the status of planning and permits, and the organization of administration and administrative action that are needed for monitoring land use and the built environment, and any documents needed for supervision or other official functions under consideration” (Land Use and Building Decree, Section 96).

The main aim of the monitoring of land use planning is to obtain information about the state and development of land use planning. The information about land use planning, realisation and procedures helps to develop the steering of land use. The functions of the Ministry of the Environment include the general development and guidance of land use planning (Land Use and Building Act, Section 17). In order to carry out this task the Ministry needs to be able to monitor the implementation of the aims of the Land Use and Building Act and the changes taking place in land use in different areas. In addition, the other parties in land use planning, such as the regional environment centres and the municipalities, also need feedback about whether the land use planning system is functioning correctly. (KATSE project group 2002, p. 3)

3 DATA MANAGEMENT OF LAND USE in the finnish environmental administration

3.1 ALUTJ (the information systems for land use)

The monitoring of land use planning forms part of ALUTJ, the information systems for land use being created as a joint effort of the Ministry of the Environment, the Finnish Environment Institute (SYKE) and the regional environment centres. In 1999, the ALUTJ working group set up by the Ministry of the Environment dealt with the development of the information systems, one of the central motives and guiding principles for the development being the land use planning reform (Ministry of the Environment 1999 A). The present situation concerning the development projects dealing with the information systems is described below (Table 1). These systems form a basis for methods for land use monitoring, which is, according to the new law, an important task from the Environmental Administration's point of view.

<u>Information system</u>	<u>Unit of information</u>	<u>Data content and sources</u>	<u>User interface</u>	
			<u>ArcView extension</u>	<u>HERTTA</u>
Subject: Plans and decisions				
GISALU (Land Use GIS)	single plan or decision	land use plans, deviation decisions, cultural environment	GISALU	map service
KATSE (the Information System for Monitoring Land Use Planning)	municipality	GISALU, completed forms for monitoring local detailed plans	(some functions combined to the GISALU extension)	completed in 2003
VASEPA (the Nationwide Regional Plan Geographical Database)	single plan	combination of planning information from regional councils on regional plans	GRIS2000	map service
Local master plan raster database	single plan	scanned master plans, which were ratified according to the old Land Use Act	completed in 2003 (GISALU/GRIS2000)	completed in 2003 (map service)

Subject: Built environment				
ELYSE (the Information System for Monitoring Living Environment)	municipality and the functional divisions within them	residential areas (both low-rise and high-rise), densely populated areas Population Register Centre, Statistics Finland, YKR data	-	completed in 2003
YKR (the Monitoring System for Spatial Structure of Urban Regions)	250 m x 250 m grid	different functional divisions (e.g. densely populated areas), YKR data, land and water areas	YKR	planned to be completed in 2004

Table 1: The subsystems of ALUTJ under construction (Malmi 29 October 2002 and The Ministry of the Environment 2002, p. 24)

3.2 HERTTA (THE FINNISH ENVIRONMENTAL INFORMATION SYSTEM)

Technically ALUTJ, the information systems for land use, are also subsystems of HERTTA (the Finnish Environmental Information System). In 1997, a proposal was prepared by the Finnish Environmental Administration on the development of a new environmental information system (The Ministry of the Environment 2002, p. 21).

HERTTA contains environmental data collected or produced by the Finnish Environmental Administration. The present version 3.1 includes subsystems concerning the water resources, the quality of surface water, ground water, species, environmental load and the map service.

HERTTA is implemented by Internet application techniques, and the browser-based user interface is used with a WWW browser (HERTTA 11 December 2002). The intranet serves the Finnish Environmental Administration, and the extranet use is possible on line for data producers and other co-operation authorities. HERTTA was built by the Finnish Environment Institute (SYKE), and the development of the HERTTA themes and technology still continues.

4 GISALU (Land use gis)

GISALU is a geographical information system created for the regional environment centres. The starting point was to build a system for operative use and to make a land use planning instrument to be utilised in land use planning, building and care of the cultural environment. The tasks of the regional environment centres were changing because of the reform in the land use planning system, and the government administration needed an advance in the guidance of land use planning and building. The aims of the GISALU project were (Repo 15 January 2002)

- Investigation of the need for harmonised geographical information system (GIS) data specifically for land use planning
- Planning of the information contents in the data
- Instructions for the compilation of compatible databases
- Promotion of the compilation and utilisation of land use information data at the regional environment centres
- The envisaged result: a system and instructions for the compilation, and taking into use, of land use information data at the regional environment centres

Most of the data contained by GISALU is produced by the regional environment centres. In addition, there is also material collected nationwide by the Finnish Environment Institute (SYKE), e.g. regional plans. The GISALU data model contains the following (Repo 15 January 2002):

Land use planning, area vector data

- Regional land use plans
- Joint municipal master plans
- Local master plans
- Local detailed plans
- Areas requiring planning

Decisions, point data

- Deviation decisions
- Decisions on planning needs
- Land extraction permits (Motto register)

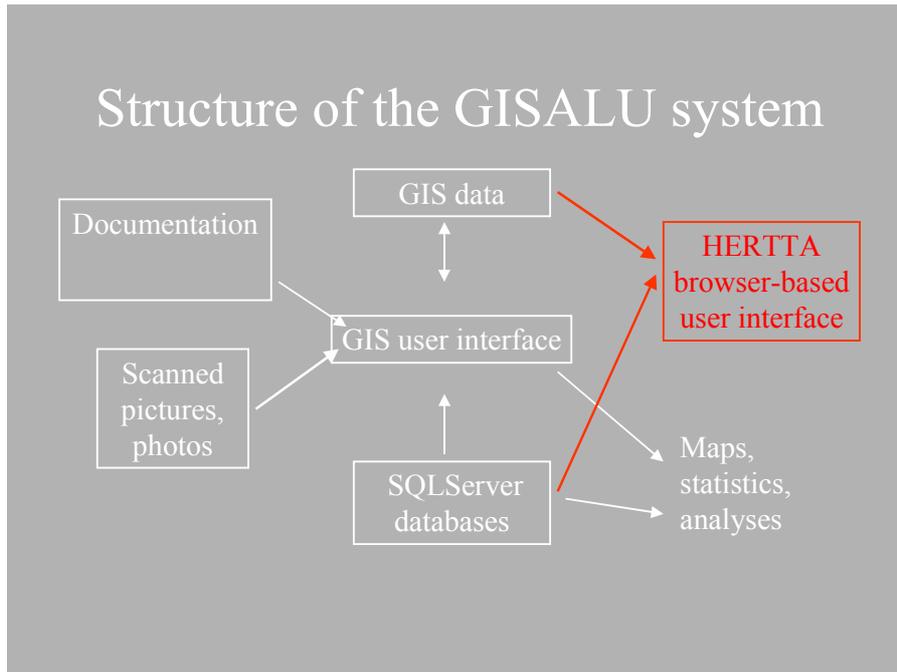
Cultural environment, both area vector and point data

- Cultural historic sites having national importance
- Areas and sites where the building stock has been inventoried
- Sites protected under the Building Conservation Act

- Landscapes, views and sites of national importance
- Cultural biotopes
- Applications for grants and aid for the care of the built heritage
- Antiquities

GISALU's pilot project started in 1996. The compilation of information and the utilisation of the data continue at the regional environment centres. The data situation varies from one regional centre to another. (GISALU working group 2001)

The GIS user interface, the data model and the databases of the GISALU information system are built by the Finnish Environment Institute (SYKE) and SYKE also gives guidance to the regional environment centres (Graph 2). The GIS user interface is an extension of the ArcView programme. The information is fed into the SQLServer databases over Access forms, which also include enquiries and summaries. In addition, data can also be viewed in the map service of the HERTTA browser-based user interface, both on the intranet and the extranet.



Graph 2: Structure of GISALU, Land Use GIS (Repo 15 January 2002)

The utilisation of the GISALU data consists of (Repo 15 January 2002)

- Monitoring and follow-up (analyses, statistics, reports)
- Operative tasks (discussions, decisions, opinions, issues dealt with by the authorities, projects)
- Thematic maps and printouts (discussions on planning and similar matters, information, publications)

GISALU is at the moment the most important information source for KATSE, the Information System for Monitoring Land Use Planning.

5 KATSE (the Information System For Monitoring Land Use Planning)

The reform of the Finnish land use and building legislation also brought about a need to renew the monitoring system. The Environmental Administration has monitored land use planning and building since the beginning of the 1970's. The collected data set is unique, because no other quarter maintains statistics about land use planning in Finland. But these established yearly reports do not fulfil the needs of the data users any more. (KATSE working group 2001, p. 4)

The monitoring of land use planning has been developed by the Finnish Environment Institute (SYKE), under the guidance of the Ministry of the Environment, since 1999. The renewed contents of the monitoring of land use planning cover the whole land use planning system as described in the Land Use and Building Act. Realisation to that extent is not initially possible because of the lack of information sources and difficulties in data formats and transmission. Today most of the original information concerning land use planning is produced outside the government's Environmental Administration - by municipalities, regional councils and administrative courts. In the creation of the information system KATSE, the municipal land use planning themes using GISALU or forms for monitoring local detailed plans as sources are prioritised. The first version of the information system will contain statistical data on these monitoring themes from the year of 2002 according to the three main parts of KATSE (KATSE project group 2002, p. 6):

I Land use plans and land use planning

- Joint municipal master plans
- Local master plans
- Local detailed plans
- Areas requiring planning

II Realisation of land use planning

- Deviation decisions
- Decisions on planning needs

III Procedures of land use planning

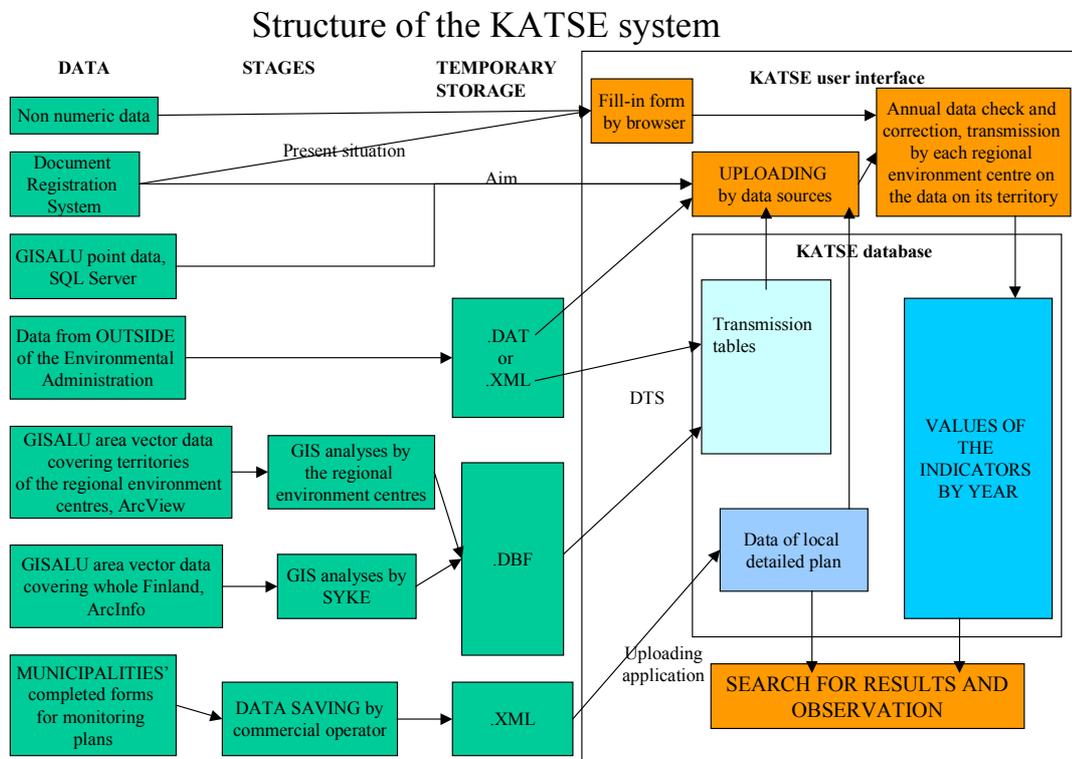
- Rectification reminders and appeals known by the Environmental Administration

These monitoring themes are broken down into more precise monitoring indicators. The most accurate unit of information is at the municipality level, and the other monitoring areas are larger administrative areas, which are counted as multiples of the municipality value. The aim is to obtain comparable data on changes taking place over time and from one area to another. The time unit used is a year. The regional environment centres can also, if they wish, use the system for monitoring land use planning on their territory for shorter periods.

The KATSE system, as well as the other parts of the HERTTA system, are built by the Finnish Environment Institute (SYKE). At the first phase of the project the main menu of the KATSE system includes

- Search for results, i.e. indicator values
- Annual reports from 2002 onwards
- Completed forms for monitoring local detailed plans
- System update (only the main users)
- Data update yearly (only the regional environment centres and the Ministry of the Environment)
- Code lists

When the data has been gathered from the different sources by the system, the regional environment centres check if the data concerning their territory is correct (Graph 3). If they consider some indicator value to be incorrect, they can correct the value directly or make the correction in GISALU, the original source of the data. After all the regional environment centres have checked the data it can be published in KATSE.



Graph 3: Structure of KATSE, the Information System for Monitoring Land Use Planning (Sipilä 3 June 2002)

Because the monitoring is based on a calendar year, it is important to make the data collection functions first. The forms for monitoring local detailed plans, which municipalities and land use planning consultants complete, are now in the form of spreadsheet

calculations. The forms will be renewed and the data collection will be taken care of by a commercial operator. All the data is saved onto the KATSE database, where it can be browsed by the users.

The intention is to have all the parts of the first version of the KATSE information system functional on both the intranet and the extranet by 15 May 2003. The contents and the functions of the information system KATSE (e.g. the utilisation of the map service) will be completed during 2003-2004.

6 References

- GISALU working group: GISALU-paikkatietoprojekti, Projektiraportti (GISALU, the geographical information project, Project report); 12 December 2001
- HERTTA, the Finnish Environmental Information System, version 3.1; Finnish Environmental Administration's Internet <https://www.ymparisto.fi/> and intranet <http://hertta.vyh.fi/scripts/hearts/welcome.asp>; Internet pages updated 30 January 2001, 11 December 2002
- KATSE project group: Kaavoituksen seurannan tietojärjestelmä KATSE, Projektisuunnitelma (KATSE, the Information System For Monitoring Land Use Planning, Project plan); Unpublished, 24 January 2002
- KATSE working group: Kaavoituksen seuranta (KATSE), Työryhmän loppuraportti KATSE-tietojärjestelmän kehittämisestä (KATSE, the Information System for Monitoring Land Use Planning, Final Report of the Working Group); Unpublished, 17 December 2001
- Land Use and Building Act; No. 132; Issued in Helsinki on February 5, 1999
- Land Use and Building Decree; No. 895; Issued in Helsinki on September 10, 1999
- Malmi, Päivi: ALUTJ, the information systems for land use; Unpublished, 29 October 2002
- Ministry of the Environment: Alueidenkäytön tiedon hallinta (Data management of land use), Esiselvitys alueidenkäytön tietojärjestelmien kehittämisestä; Ympäristöministeriön moniste 54; Helsinki 1999 A
- Ministry of the Environment: Land use and building legislation in general; <http://www.ymparisto.fi/eng/environ/legis/landuse.htm> Land Use and Building Act; Internet pages updated 15 April 2002, 28 November 2002
- Ministry of the Environment: Monitoring the living environment, Shortened version of the working group report; The Finnish Environment 579, Land use; Helsinki 2002
- Ministry of the Environment: The New Land Use and Building Act of Finland, The new system of land use plans; presentation slides; Unpublished, 1999 B
- Rautsi, J.: Reform in the Land Use Planning System, The New Land Use and Building Act of Finland; Ministry of the Environment, Land Use Department; Concept 1999
- Repo, Riikka: GISALU-project; presentation slides; Unpublished, 15 January 2002
- Sipilä, Jorma: Structure of KATSE, the Information System for Monitoring Land Use Planning; Unpublished, 3 June 2002