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GRID Map of Household and Population data in Kosovo

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ABSTRACT

The increase of the need for statistical spatial data with a high accuracy encourages the use of GIS in the Statistical Office of Kosovo (SOK). GIS as an integrated database composed of a multi sections and hierarchical units facilitates a connection of statistical information with small territorial units, such a base easily can be analysed, compared and presented in different forms (tables, graphs, maps etc).
The approach used based in GIS for dissemination the statistical information also is encouraged by international recommendations with a purpose of data standardisation in line with GISCO and INSPIRE directives.

In this workshop we will present the method of collection of data for the creation of GRID Map of Household and Population Data in Kosovo as well as the content of WebGIS system in Statistical Office of Kosovo that is of key importance for dissemination of statistical information.

A new production method for grid statistics which is based on a relational database started adopted at Statistical Office of Kosovo. In the new production method the compilation of grid statistics is based on the location data of buildings. Various attribute data on number of persons, households, buildings and dwellings can, with the help of links between tables, be assigned to specific buildings.
Since the beginning of 2005, the GIS and Cartographical Unit is developing the cartographical database for preparations of census maps as part of digital spatial comprehensive infrastructure. The main objective was to establish a database system to support the planning and monitoring of census operations and dissemination of spatial census results including the smallest territorial units.

Key word: GISCO, INSPIRE, SOK, EA Enumeration areas, WebGIS

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1. **Introduction**

In this paper we shall make the description of geo-database for population census, implementation and management of this database, procedures for update of Enumeration Areas and dissemination of data through GRID model.

Until now the data at Statistical Office of Kosovo (SOK) have been published in aggregated form in the municipality and settlement level. Grid like a new method to be implemented at SOK shall help in dissemination of statistical data with a higher spatial accuracy.

In addition to data on the number of households and number of population that have been entered into grid form, we expect that in the near future we shall have other types of statistical data such as in social statistics, economic, agricultural and demographic data that shall be analyzed and disseminated through grid.

2. **New data products: Estimates data and the grid map**

Creation of the map representing the distribution of population using the Grid method and with the help of GIS for the whole territory of Kosovo it is of special importance not only for the field of statistics but also for the society of Kosovo in general.

This map would contribute in enrichment of the national geo-database and GIS.

In this paper we shall present the methods and the approach of creating the data and creation of dissemination of population based on the Grid 1km x 1 km.

After the digitalization of buildings from the orthophotos of 2004 and update of them based on the satellite images of 2008, Statistical Office of Kosovo has gathered data on the number of households, number of inhabitants and other statistical data for every single building in Kosovo. These gathered data / information shall serve as a base for conducting a successful population census in Kosovo.

Following the digitalization and data gathering processes, all the information have been entered into GIS and therefore on this base the thematic map has been created and presented in
1km x 1km Grid.

All these information have been gathered directly from the households using door to door method. Initially it was created the centroids with X, and Y values and the number of inhabitants for each centroid of the occupied buildings, followed by the creation of the link of them with each specific 1 km x 1 km grid and finally it was created the vectorial base (grid with data on the number of inhabitants).
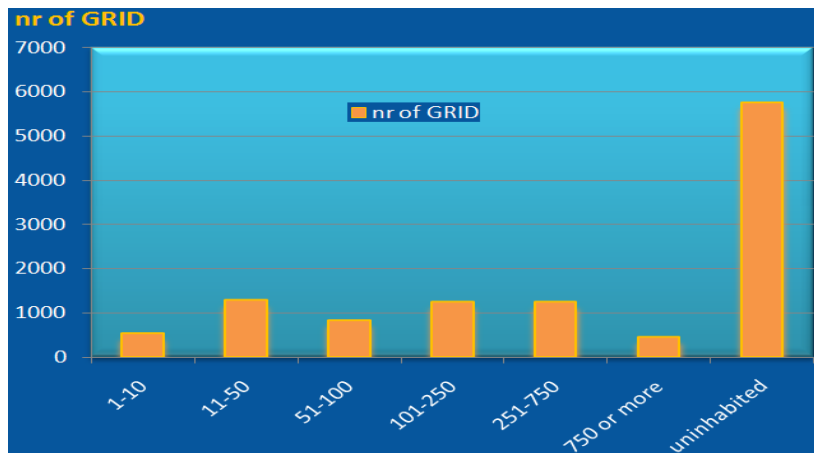
Fig.1 Data producing process - from points to grids

Grid map 1km x 1km is created using **WGS_1984_UTM_Zone_34 NH.**
File format MapInfo+dBase-format

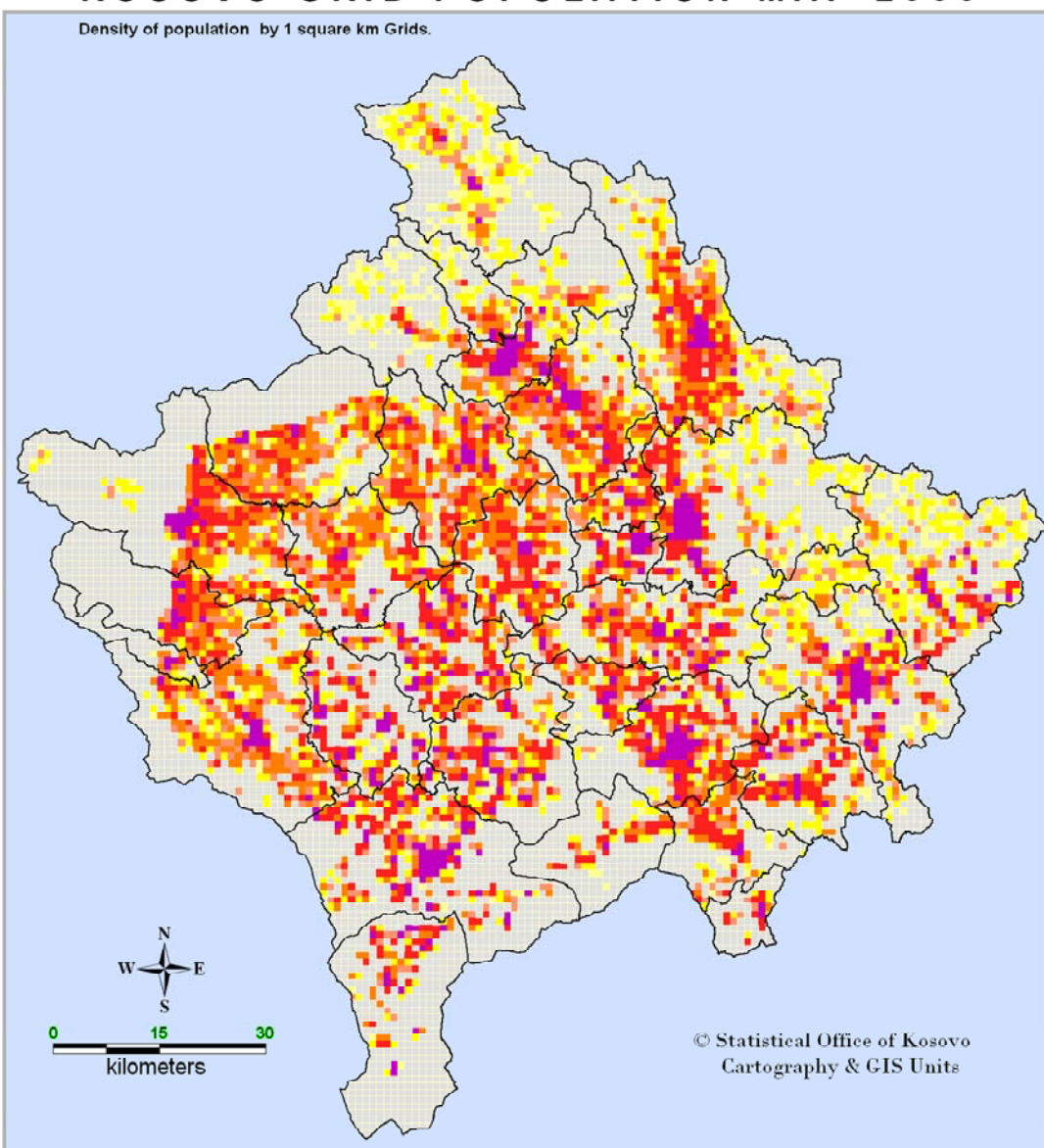| Inhabitans per individual square kilometre	No
1-10	523
11-50	1276
51-100	831
101-250	1248
251-750	1243
750 or more	447
Uninhabited	5774
Total	11342

Tab 1. No of Grids by number of Inhabitans

Graf 1. No of Grids by number of Inhabitans

KOSOVO GRID POPULATION MAP 2009

Density of population by 1 square km Grids.

N
W E
S

0   15   30
kilometers

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Cartography & GIS Units

LEGEND:
Inhabitants per individual square kilometres 1 km x 1 km

uninhabited	(5774)
1 - 10	(523)
11 - 50	(1276)
51 - 100	(831)
101 - 250	(1248)
251 - 750	(1243)
750 or more	(447)

Data source : Statistical Office of Kosovo
Estimate Data,
Data are collected from field listing every
present household, Informations are prepared
for population census and for other statistical
inquires.

3. Creation of WebGIS at Statistical Office of Kosovo

Statistical Office of Kosovo (SOK) for the first time in 2009 has created the Web GIS. The users of the Web GIS are meant to be SOK, other public institutions of Kosovo and the general public. Initially the Web GIS is designed in Albanian language only.

SOK through the Web GIS shall offer updated statistical data that shall be of a wide use. Web GIS in addition to offering various statistical data it also offers the possibility of analyzing the special statistical information based on the SQL and other methos of analysis such as creation of technical maps based on demographic and socio-economic structures, measure of lengths, creation of buffers, selections according to themes and grouping of information according to specific standards etc.

* Web GIS is based on the MapInfo and ESRI technology.
* All the layers presented in the Web GIS are in the coordinative system UTM-WGS 1984 Nh.
* Statistical Data that shall be presented in WebGIS are taken from the statistical data published by SOK.

Platform

* Web Application dedicated to SOK
* User friendly with .NET technology
* Queries features and view results in map view
* Results in tabular and map format
* Fast, good image/map quality
* Image size limited only by server capabilities
* User ESRI/MapInfo files

• **The map layers**
territorial division (Kosovo, counties, municipalities, settlements, Grid 1 km x 1km) .
• **The active information layers according to the map layers**
Alphanumeric information, data on the field of employment according to sectors, number of business, data from the field of education, judiciary, agriculture etc.

- **Activities**

Search by location of objects, by name, Query, Buffers, Distance, filters, select by polygon, by square by data, overview window printing options etc.
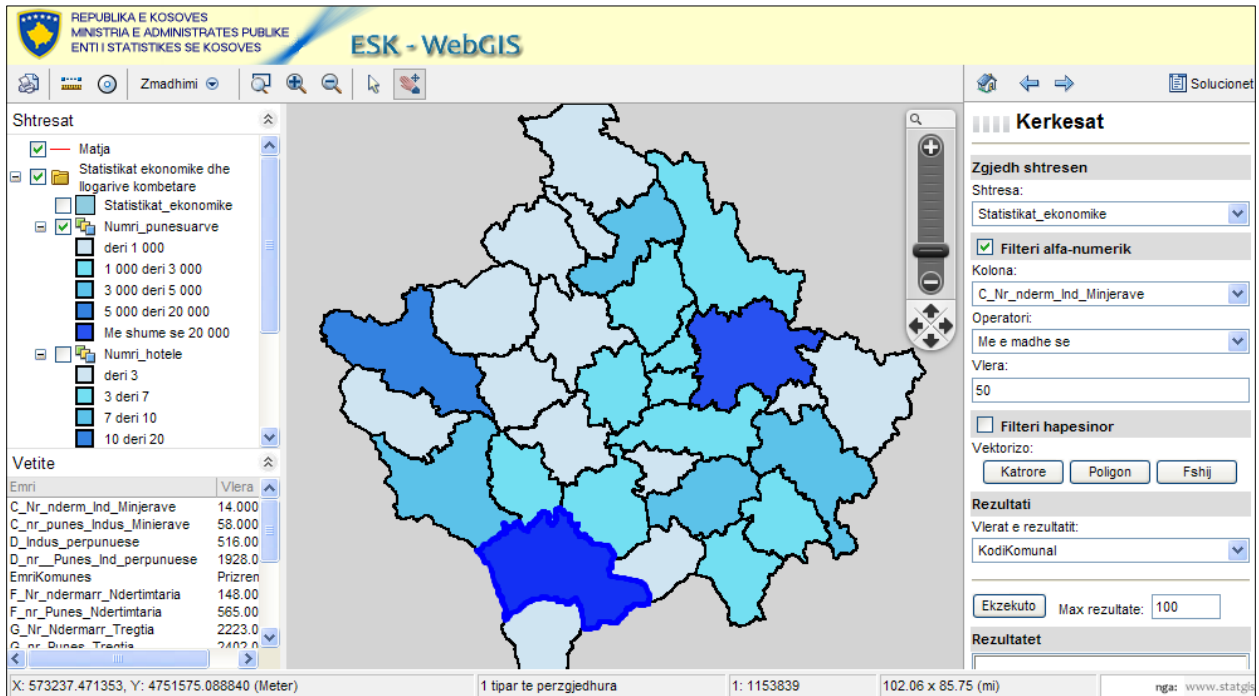

Fig 2.

Web GIS at SOK for the time being is in a pilot / experimental phase, however, it is planned that starting from the early November it shall be in use for a wider general public.

4. **Conclusion**

After the Census it shall be created the possibility for entering all the data (such as those from the social, economic, demographic, agricultural) in grid and also the dissemination of them through the system of WebGIS.

Planned future activities in Cartography and GIS Office are:

➢ Production of thematic mapping and spatial analysis, data dissemination and services
➢ Implementation of a grid system for all statistical data dissemination.
➢ Update of statistical data in GIS and dissemination of them through the Web GIS
➢ Cooperation with other Institutions for the definition and implementation of a NSDI
➢ Development of metadata information

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