



Spatial Data Infrastructures in Bulgaria: State of play 2010



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Report meta-information

Title	Spatial Data Infrastructures in Bulgaria: State of Play 2010
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Date Issued	2010-09-01
Subject	INSPIRE State of Play
Publisher	K.U.Leuven (SADL + ICRI)
Description	This report is summarizing the review of SDI in Bulgaria
Contributor	Danny Vandembroucke & Dimitrios Biliouris (SADL), Katleen Janssen (ICRI), Joep Crompvoets (OE)
Previous Contributor	Jos Van Orshoven (SADL), Danny Vandembroucke(SADL) and Ulrich Boes (URSIT Ltd)
Format	MS Word 97/2000
Audience	INSPIRE Stakeholders
Identifier	rcr09BGv91.doc
Language	EN
Coverage	Autumn 2009 – Spring 2010

Version number	Date	Modified by	Comments
1.0	2002-12-05	Danny Vandembroucke (SADL) & Peter Beusen (ICRI)	First version
2.0	2002-12-20	Jos Van Orshoven (SADL)	Completion & harmonization with 31 other country reports
3.0	2003-08-13	Jos Van Orshoven (SADL)	Integration of information from the GISEE-study; Addition of executive summary, abbreviations and acronyms; Harmonisation with 31 other country reports
4.0	2004-06-16	Katleen Janssen (ICRI)	General review, corrections and update of legal framework
5.0	2004-07-26	Danny Vandembroucke (SADL)	Update with information of final report GISEE study and info provided by Mr. Boes
6.0	2005-06-25	Ulrich Boes	Revisions for the 2005 update
6.1	2005-07-01	Danny Vandembroucke	Review, modification executive

			summary
6.2	2005-07-25	Katleen Janssen (ICRI)	General review, corrections and update of legal framework
7.0	2006-12-22	Katleen Janssen	Review of the legal and organizational aspects, update 2006
7.1	2006-12-27	Danny Vandenbroucke	Consolidation and modifications structure and content
8.0	2008-03-27	Katleen Janssen (ICRI)	Correction and update legal and organizational framework
8.1	2008-07-23	Danny Vandenbroucke (SADL)	Metadata and final changes
9.0	2010-06-18	Dimitrios Biliouris (SADL)	Review of the 2009 update
9.1	2010-07-22	Katleen Janssen (ICRI)	2009 review of the legal framework

Change matrix 2010 versus 2007

A concise graph is added to indicate changes of the various paragraphs compared to the previous report. Two colours are used: Green and Yellow indicating major and minimum changes respectively compared with the 2007 State of Play. This graph does not reflect the country situation. Merely it represents our findings/changes per section on our preparation of the desktop analysis



Executive summary

Since 2004, efforts have been made to structure the Bulgarian SDI activities. The work is coordinated by two agencies: the State Agency for Information Technology and Communications (SAITC) and the Agency for Sustainable Development and Eurointegration (ASDE). The objective is to coordinate activities from ministries, regional and local authorities, specific agencies, and organize collaboration with the private sector. Major efforts are made to develop new datasets which are basic components for the building the INSPIRE oriented Bulgarian SDI. Progress is however slow which is at least partly due to the very fragmented GI-sector which is illustrated by the non existence of a single national mapping agency. The major data producers and – in the absence of a user driven coordination body- also coordinators are the military topographic service on the one hand and the Ministries of Regional Development and Public Works and the Ministry of Environment on the other hand.

Complemented by the efforts of the Ministry of Environment to build environmental information systems to comply with EU-regulations and obligations, the recent and ongoing Cadastral infrastructure project constantly updates mapping data. A future parallel step seems to be the production, availability and accessibility of metadata. Harmonisation and standardization of data as produced by the multiple producers is another urgent issue.

The more recent developments (2004-2005) focus on the link with e-government and the development of portal(s) and services. At the end of 2004 and beginning of 2005, two independent associations were created in Bulgaria. October 2004 was the date of the creation of the Association for Geospatial Association in South-East Europe, AGISEE (www.agisee.org). This association aims at bringing players in all countries of South-East Europe together for a permanent information exchange and at serving their interests. The Bulgarian Association for Geospatial Information Systems, BAGIS (www.bagis.bg) was created in the beginning of 2005 and aims to foster the growth of a GIS society in Bulgaria and to promote the development and wider use of GIS in Bulgaria. It is expected that both associations will play an important role in the further development of the Bulgarian SDI.

In 2008, the Council of Ministers adopted a Resolution to approve the Action Plan for the implementation of the INSPIRE directive and a Resolution to nominate SAITC as the institution responsible for the implementation of INSPIRE (Philipov, 2009). At the end of 2009 due to administration restructuring, SAITS joined the Ministry of Transport, Information Technology and Communications (MTITC). By a decision of the Council of Ministers of 23 December 2009 a draft law on access to spatial data has been approved.

Some services exist but are only in Bulgarian.

Table of Contents

CHANGE MATRIX 2010 VERSUS 2007	3
EXECUTIVE SUMMARY	4
TABLE OF CONTENTS	5
ABBREVIATIONS AND ACRONYMS.....	6
1 GENERAL INFORMATION	8
1.1 METHOD	8
1.2 GENERAL OVERVIEW OF THE GI-SECTOR IN BULGARIA	8
1.3 OVERVIEW OF SPECIFIC SDI-INITIATIVES	13
2 DETAILS OF THE NSDI OF BULGARIA.....	15
2.1 GENERAL INFORMATION	15
2.2 COMPONENT 1: COORDINATION AND ORGANIZATIONAL ISSUES.....	17
2.3 COMPONENT 2: LEGAL FRAMEWORK AND FUNDING.....	20
2.4 COMPONENT 3: DATA FOR THEMES OF THE INSPIRE ANNEXES.....	23
2.5 COMPONENT 4: METADATA	27
2.6 COMPONENT 5: NETWORK SERVICES.....	28
2.7 COMPONENT 6: THEMATIC ENVIRONMENTAL DATA	31
2.8 STANDARDS	34
2.9 USE AND EFFICIENCY OF SDI	34
3 ANNEXES	36
3.1 LIST OF SDI ADDRESSES / CONTACTS FOR BULGARIA	36
3.2 LIST OF REFERENCES FOR BULGARIA	37

Abbreviations and acronyms

AGCC	Agency of Geodesy, Cartography and Cadastre
APIA	Access to Public Information Act
ASDE	Agency for Sustainable Development and Eurointegration
ABDS	Administrative Boundary Data Services
AGISEE	Association for Geospatial Association in South-East Europe
APIA	Access to Public Information Act
BAGIS	Bulgarian Association for Geospatial Information Systems
BASA	Bulgarian Aerospace Agency
BEEA	Bulgarian Executive Environment Agency
BSDI	Bulgarian Spatial Data Infrastructures
CA	Cadastral Agency
CDDA	Central Database of Designated Areas
DGCG	Department of Geodesy, Cartography and GIS
Digital-SEE	Spatial Data Warehouse of South East Europe
EEA	Executive Environment Agency
EIA	Environmental Impact Assessment
EIB	European Investment Bank
ExEA	Executive Environment Agency
FIR	Further Investigation Required
GEIXS	Geological information exchange system
GEOSS	Global Earth Observation System of Systems
GI	Geographical Information
GIS	Geographical Information System
GISEE	GIS Technology and Market in South East Europe
GISIG	Geographic Information Systems International Group
GML	Geographic Markup Language
GPD	Geo -spatial data
GPS	Global Positioning System
GSDI	Grid-enabled Spatial Data Infrastructure
IMWG	Inter-ministerial Working Group
INSPIRE	INfrastructure for SPatial InfoRmation in Europe
IPPC	Integrated Pollution and Prevention Control
IUCN	International Union of Conservation of Nature Categories
MAF	Ministry of Agriculture and Forestry
MoAF	Ministry of Agriculture and Forestry
MOCG	Main Office of Cadastre and Geodesy

MoEW	Ministry of Environment and Water
MOJ	Ministry of Justice
MTS	Municipal Technical Services
NIA	No Information Available
NIMH	National Institute of Meteorology and Hydrology
NSMB	National System for Monitoring of Biodiversity
NSDI	National Spatial Data Infrastructures
NSEM	National System for Environmental Monitoring
PANEL-GI	Pan-European Link for Geographical Information
PPP	Public-private partnerships
PSI	Policy and legislation on access to public sector information
ReSAC	Remote Sensing Application Center
RIEWs	Regional Inspectorates of Environment and Waters
RTD	Research & Technological Development
SAITC	State Agency for Information technology and Communications
SDI	Spatial Data Infrastructures
SQL	Structured Query Language
UML	Unified Modelling Language
UNSDI	United Nations Spatial Data Infrastructure
URISA	Urban and Regional Information Systems Association
WELL-GIS	West-Eastern Linked Laboratories
WFS	Web Feature Service
WMS	Web Mapping Service
XML	Extended MarkUp Language

1 GENERAL INFORMATION

1.1 Method

This report is summarizing the review of SDI in Bulgaria, and reflects the degree to which the SDI situation in Bulgaria is similar to the ideas set out in the INSPIRE position papers¹, in the INSPIRE scoping documents and in the INSPIRE Directive.

The 2002 report was based mainly on the analysis of web sites readily accessible and on documents presented on several workshops and conferences. A particular important source of information were the –at the time of reporting in 2003- unpublished extracts of the report of the GISEE-project, a study commissioned by the European Commission on the GIS Technology and Market in South East Europe (Contract N° IST-2001: 37994). The final report of this GISEE-study was used to update the report in spring 2004. Comments from Mr. U. Boes (URSIT Ltd.) regarding the spring 2003 version of the report were integrated as well. For the update of 2005, comments and modifications from Mr. U. Boes were again integrated. For the update of 2006, some web sites were re-visited and information obtained from presentations at the workshop “Preparing the National INSPIRE Information Days” (organized by JRC for the new and candidate Member States), was integrated. For the update of 2007, we received some input from SAITC on the set-up of an Inter-ministerial Working Group on INSPIRE. Neither the templates, nor the data questionnaire was answered, but they were distributed amongst different Ministries for further consideration. Some information on the transposition of relevant European legislation (PSI, c-right) was found through other channels.

For the 2009 update the information extracted from the survey questionnaire, the web and the available presentations/publications from workshops and conferences were used. In this version obsolete information was removed, while a conclusion paragraph regarding the status of each indicator was added for each component.

1.2 General overview of the GI-sector in Bulgaria

The use of geographical information is difficult due to the unclear technical and legislative rules. Between 2002 and 2004, there were some key-players on the GI and SDI scene.

The **state organizations** that assume a dominant role for spatial data infrastructures are:

- The Ministry of Regional Development and Public Works (www.mrrb.government.bg) together with the Agency of Geodesy, Cartography and Cadastre (AGCC) is responsible for the provision of large scale topographic maps (scale 1:10.000 and 1:5.000) and the cadastre. It

¹ INSPIRE position papers, final versions: RDM, ETC, DPLI, ASF, IST, IAS (latest version).

maintains the State Levelling Network. All corresponding activities are carried out within the Agency of Geodesy, Cartography and Cadastre.

- The Military Topographic Service; responsible for the survey of the country in scale 1:25.000 and producing topographic maps in scales 1:25.000, 1:50.000, 1:100.000, 1:200.000, 1:500.000 and 1:1.000.000. It also maintains the State Geodetic network;

Since 2004, Bulgaria is re-thinking how to develop the GI sector and Bulgarian SDI. Two agencies are playing an important role in this:

- The State Agency for Information Technology and Communications (SAITC) and,
- The Agency for Sustainable Development and Eurointegration (ASDE).
- The Ministry of Agriculture and Forestry maintains the agricultural cadastre after restitution of the agricultural lands and forests in Bulgaria was carried out.

A new approach was developed called the “Sustainable Development Concept related to National Spatial Data Infrastructure” which was approved by the Bulgarian government in 2004 (Decree of the Council of Ministers 761). Key topics in this concept are building partnerships, interoperability and integration. The approach is interdisciplinary and is focusing on the environmental sector. The above mentioned decision of the Council of Ministers aims reach unified national data for the territory, resources and population. A national plan is under development to reach this objective.

- The Ministry of Environment and Water, (www.moew.government.bg) with its Executive Environment Agency (EEA) (<http://nfp-bg.eionet.eu.int/ncsd/ncsd/eng/index.html>) which manages almost 80-90% of all environmental information. This Ministry also hosts the Bulgarian Geological Survey (called Division of Subsurface and Underground Resources). Part of this division is the department of Geology and Permits for Exploration which holds databases on geology and geomorphology (Geofund project);
- The Ministry of Environment and Waters, the Executive Environment Agency and their 15 regional bodies and municipalities administer environmental protection in descending levels of authority. For this purpose MoEW oversees the collection and dissemination of information concerning the state of the environment and the environmental impacts of various activities. The EEA, as an administration to the Minister of Environment and Waters, is responsible for the collection, processing, storage, and publication of environmental information.

The Ministry of Agriculture and Forestry (MAF) and the Ministry of Environment and Waters (MoEW) have their own departmental cadastres. The Ministry has accumulated a

big amount of geo data during the agrarian land reform in Bulgaria. A lot of norms were created by the same ministry for collecting the data.

Several other ministries or administrations also deal with spatial data, but their influence is less. However, this data is very important as classified in Annex 1 of Directive EC/2/2007. They create data to a lesser extent, which is driven by their application interests:

- Ministry of Finance (www.minfin.bg) - tax offices, custom offices, etc.;
- Ministry of Justice (<http://www.justice.government.bg/new/>) - courts of justice, notary's offices, National Property register;
- Ministry of Interior (www.mvr.bg) - passport control;
- National Statistical Institute (www.nsi.bg);
- Bulgarian Academy of Sciences (www.bas.bg) - Geographic Institute, etc.
- The National Institute of Meteorology and Hydrology (NIMH) (www.meteo.bg) collects processes and stores data on the weather and climate, as well as on quantitative characteristics of surface and ground water.
- The Ministry of Health (www.mh.government.bg) monitors impacts on the natural and working environments that affect human health; determines the state policy for preventive healthcare and the quality of drinking water;
- Ministry of Transport, Information Technology and Communications (www.mtict.government.bg): responsible for the transport network in Bulgaria; prepares norms for harmful emissions from vehicles and oversees their implementation;
- The Ministry of Economy, Energy and Tourism (<http://www.doe.bg/cgi-bin/i.pl>): elaborates programmes for development of the energy sector, and particularly for the reduction of environmental pollution by energy-related activities; develops and supports the implementation of policies for effective and rational use of energy and use of alternative energy sources; responsible for pipelines and electric cable lines network.
- Local administrations and municipal bodies play an important role in the implementation of environmental policy. In this respect their main functions include developing environmental protection programmes and action plans, primarily concerning air quality, urban waste, and water management; developing and implementing overall policy at a local level on the collection, transportation, and safe disposal of municipal waste; overseeing the disposal of waste and hazardous substances within their jurisdictions; overseeing the construction, maintenance and operation of urban wastewater treatment plants; informing the public about the state of the environment; overseeing the observance of environmental laws by small facilities of local importance.

Local administrations handle obsolete legacy cadastre, local transport, and local address grid.

Private Sector Companies

In the private sector, companies may be data providers, software or service providers. Some large private companies produce data for specific purposes, and they own therefore these data. It is especially valid for public service companies such as electricity and gas distribution, water and sewage network.

Users

Among the major users of spatial data are public (central/regional/local) organizations such as the Ministry of Environment and Waters, the Ministry of Transport, Information Technology and Communications, the Ministry of Regional Development and Public Works, the Ministry of Defence and the National Statistical Institute. Furthermore, local authorities in major cities, and the electrical distribution company are major users.

Several private companies use spatial data such as some Security firms, telecommunications companies (Mobitel, Vivacom, Globul), Water distribution companies, and others. Also, universities, the Bulgarian Academy of Sciences and Bulgarian Aerospace Agency (BASA) are users of spatial data.

Associations related to GIS

At the end of 2004 and beginning of 2005, two independent associations were created in Bulgaria. October 2004 was the date of the creation of the Association for Geospatial Association in South-East Europe, AGISEE (www.agisee.org). This association aims at bringing players in all countries of South-East Europe together for a permanent information exchange and at serving their interests. The Bulgarian association for Geospatial Information Systems, BAGIS (www.bagis.bg) was created in the beginning of 2005 and aims to foster the growth of a GIS society in Bulgaria and to promote the development and wider use of GIS in Bulgaria.

A Union of Surveyors and Land Managers of Bulgaria (no web site) and a Geodesy association (no web site) are active.

Projects

- Despite this fragmented GI-scene, a number of significant projects for the development and use of spatial data have been carried out in Bulgaria.

Recent projects include:

- CORINE Land Cover in which the private company Datecs works together with BAS;
- the Geofund project which aims at creating a geological database at scale 1:50.000;

- the ALIS project of the Ministry of Agriculture and
- the GIS-project of the City of Sofia.
- FAO/UN/ TCP/ BUL 8922 project for the purposes of the Ministry of Agriculture and Forestry - Land cover maps in scale 1: 50 000 and 1: 5000.

Apart from these governmental led projects, some SDI-related projects in the area of GIS and with Bulgarian participation are funded by the European Commission in its ESPRIT, COPERNICUS, IST or e-content programmes. Such projects are for example the projects Digital-SEE (The Spatial Data Warehouse of South East Europe), GEIXS (Geological information exchange system), WELL-GIS (West-Eastern Linked Laboratories), PANEL-GI (Pan-European Link for GI), or ABDS (Administrative Boundary Data Services).

The Agency of Geodesy, Cartography and Cadastre, the Ministry of Regional Development and Public Works and also the Ministry of Environment and Waters are in charge of several GI-based projects that are funded by the Phare, ISPA and SAPARD-programmes, partially also by other donors such as EIB and WB. One example relates to waste water treatment.

Education and Research on GI

A number of universities offer GIS courses, but it is not sufficient for the market demand. Several universities in Bulgaria have departments that deal with spatial data and offer courses on GIS. Such universities are:

- Technical University of Sofia, Sofia, (www.tu-sofia.bg) (Faculty Computer System and Control; Faculty of Communication);
- University of Mining and Geology “St. Ivan Rilski”, Sofia, (www.mgu.bg) (Department Geology and Research; Department Geodesy; Department Geography; Department Geology and Environment);
- University of Architecture, Civil Engineering and Geodesy, Sofia, (www.uacg.bg/UACEG_site/index_e.html) (Department of Surveying and Geo-informatics; Department of Applied Geodesy; Department of Photogrammetry and Cartography);
- Sofia University “St. Kliment Ohridski”, Sofia, (www.uni-sofia.bg) (Department of Geology and Geography);
- University of Forestry, Sofia;(www.ltu.bg);
- Technical University of Varna, Varna, (www.tu-varna.acad.bg) (Faculty of Computer Science and Technology);
- American University in Blagoevgrad; Blagoevgrad , (www.aubg.bg);
- Agricultural University of Plovdiv, Plovdiv, (www.au-plovdiv.bg) ;

- Shoumen University “Konstantin Preslavski”, Shoumen, (www.shu-bg.net) (Department of Geography);
- South-West University “Neofit Rilski”, Blagoewgrad , (www.swu.bg) (Department of Geography; Department of Computer Systems and Technologies);
- Bulgarian Academy of Science, with its Institute of Geography, and Geological Institute "Strashimir Dimitrov", (www.bas.bg).

1.3 Overview of specific SDI-initiatives

As a first non-governmental step towards the creation of a SDI, the GISIG (Geographic Information Systems International Group) secretariat has been established in 1998 at the Technical University of Sofia, creating a National Focal Point on GI, and even for Southeast Europe.

A very important event with respect to the raising of awareness for SDI in Bulgaria seems to have been the national workshop on “Geographic Information Infrastructure - 2000” held in June 2000 in Sofia. Its goal was to discuss the status of the Bulgarian SDI. The outcome of this workshop is however not clear.

An important SDI-like initiative from the private sector is taken by DOMINO SLTD (<http://www.Bulgaria.domino.bg>), a private Bulgarian company which was created in 1991. The activity is oriented towards development and implementation of multimedia products and technologies, web development, publishing of cartographic products, business catalogues, etc. DOMINO has made the official web sites of 75 Bulgarian Municipalities and maintains them. It prepared also the web presentation of many companies in Bulgaria. DOMINO has made maps of all cities of Bulgaria, also detailed road maps of Bulgaria and Europe, maps of all Bulgarian resorts. This information is made available on the company’s web site. The publishing company "DOMINO" supplies cartographic products for OMV, SHELL, METRO, and LUKOIL - with Bulgaria.

The site <http://www.bgmaps.com> of the company DATECS is the most visited site offering online maps, address, street search, positioning; hotel, restaurant, pub, store search in 19 BG cities, and 9 Winter and Summer resorts. It is possible to search mountains, peaks, monasteries, caves, lakes, etc., and it offers a possibility for route search. Everyone can free of charge add his own URL link to the web page www.bgmaps.com . The service “virtual server” is paid and it offers a map made by bgmaps.com appearing via a link in one’s web page and is showing the location of a company. Another paid service is the advertisement in bgmaps.com.

Although it is obvious that at present in Bulgaria there is no real central body for GI-related issues and that there is no state policy defining which organisations have mandates or rights for providing digital geographical data, in this report we consider the Ministry of Regional Development and Public Works and its Agency of Geodesy,

Cartography and Cadastre (AGCC) to be the potential central node of a future NSDI. The Ministry is responsible for most of the policies in which a spatial component is important: regional policy and planning, physical and urban planning, public works, water supply, sewage systems, housing, cadastre, etc. The current organization of the new Agency of Geodesy, Cartography and Cadastre is indeed a driving force for an NSDI and is a major project for integration of different types of spatial data in Bulgaria. In every municipality, offices for the territorial cadastre exist, but not all are using the new digital cadastre.

The Ministry of Regional Development and Public Works has become full member of EuroGeographics in 2003.

Since 2004, efforts have been made to structure the Bulgarian SDI activities. The work is coordinated by two agencies: the State Agency for Information Technology and Communications (SAITC) and the Agency for Sustainable Development and Eurointegration (ASDE). The objective is to coordinate activities from ministries, regional and local authorities, specific agencies, and organize collaboration with the private sector. Major efforts are made to develop new datasets which are basic components for the building the INSPIRE oriented Bulgarian SDI

2 Details of the NSDI of Bulgaria

2.1 General Information

Cadastral mapping in Bulgaria has not achieved full coverage of the national territory. The present cadastral mapping is fragmentary, since the administration of farmlands, forests and urbanized lands has never been in one single government institution. Likewise, the land registration function for private and public land has never been uniform and in one register. Land data are kept by different agencies, as well as with private surveying companies.

In the early 1990s Bulgaria launched extensive reforms. The principles of private real property rights and liberalized land markets were restored in the legislation. Several land restitution laws were passed, affecting farmlands, forests, nationalized immovable properties, and expropriated properties. Local self-governments were re-established and municipal and state property was regularized by law. Land tenure security for farmland leases was further improved by pertinent legislation. The institution of private notaries was introduced. New land market professions emerged: realtors, developers, land valuers.

The restitution program generated large numbers of private landowners. The farmland restitution, which was practically completed in the year 2000, produced nearly 8.3 million individual plots, belonging to approximately 1.9 million former owners. The forest restitution, 85% of which had been completed by April 2001, will generate a further 0.2 million individual plots. The ongoing restitution and privatization of state and municipal properties established a multitude of new owners and frequently new plots. Following the restitution process, further subdivisions are ongoing of nearly all the inherited real estate. The liberalized urban land markets, with leases and sales, brought about a boom in the number of transactions in land.

To respond to these issues, new integrated cadastre and property registration systems will be implemented following a gradual process. In order to avoid any disruptions to the rural land markets, the Land Commissions, so far involved in the restitution of rural land, will continue to keep a database for rural land property ownership until the regional cadastre offices are ready to receive this information. The Land Commissions databases will gradually decrease as the databases in the regional cadastre offices increase. Once the data on rural areas will have been completely transferred to the Agency of Geodesy, Cartography and Cadastre, the Land Commissions will keep the functions related to the maintenance of data on land use according to the requirements set by the Common Agricultural Policy and other programs of the European Union.

In the case of urban land, some of the existing municipal cadastres are large organizations providing a comprehensive service to local administrations. Others are smaller or less effective. The range of activities and the amount of work vary between offices like Sofia or Varna with sophisticated computerised systems and staff of over a hundred to small offices with a few people working in a paper environment. Each municipality must be looked at independently as they have different resources and capabilities. In general, the

municipal cadastres (within the Municipal Technical Services (MTS) which undertake building permitting, development control and cadastre services) will continue to operate as they now do, but will be given methodological guidance and will be monitored by the regional offices of the Agency of Geodesy, Cartography and Cadastre. The municipal cadastres will relinquish their data and part of the cadastre function to the regional cadastre offices, and maintain the function of providing a service to the clients (i.e. owners of real properties, Government departments and organizations, notaries, lawyers, courts, surveying companies, real estate agencies, banks, etc.). They will be linked to the database of the regional cadastre office and, in exchange for fees, they will provide a service to the citizens in terms of query results about properties, excerpts of plans of real property, query results about the property status of a person, certificates of cadastral status, copy of cadastre map, etc.

The legal rights part of the registration system is conducted by the 112 district courts under the oversight of the Ministry of Justice (MOJ). They record legal rights and the owners of those rights, to real property. Under the project, a new system of legal registration was introduced in 2009 that is based on real property units. It will eventually replace the existing so-called "entry book system," which is a transaction or person based system, that only operates when documents are transacted and registered in the courts.²

e-Government:

In view of the accession to the European Union, the Bulgarian government defined in 2002 its e-government strategy. Following the strategy, the plan for its realization from 2003 until 2005 was prepared and adopted by the Council of Ministers. Several related laws such as the one for electronic signature and electronic documents, the law on personal data protection and the law of classified information protection were adopted and put into implementation. In 2007 the Electronic Governance Act was passed.

The relation between e-government and the Bulgarian SDI has led to many discussions. On one side, several services require spatial data. On the other side, the organization of the cadastre and property registration in Bulgaria has been widely discussed by working groups in the context of the e-government strategy. This has been supported by the state government of Bavaria in Germany, and the proposal is to use the same model as in Bavaria. The [State Agency for Information Technology and Communications](#) (SAITC) organized - on the occasion of the implementation of the European Union's INSPIRE directive - online training courses for Municipal Administrations in the Republic of Bulgaria. 77 Bulgarian Municipalities have already received their certificates after having successfully completed a series of online courses on how to create the necessary infrastructure for geo-spatial data.

The Agency of Geodesy, Cartography and Cadastre:

The April 2000 *Law of United Cadastre and Property Register* established the Cadastre Agency. Next, the Geodesy and Cartography Act, which had already passed a first

² Source: World Bank

reading in Parliament in 2001, was adopted on 23 March 2006. Pursuant to that Act, the Cadastre Agency was transformed into the Agency of Geodesy, Cartography and Cadastre (AGCC). The Agency of Geodesy, Cartography and Cadastre is an executive agency with a seat in Sofia and 28 cadastre offices, placed in the administrative centres of the regions in Bulgaria. The Agency is an administration under the Minister of Regional Development and Public Works.

The activities the Agency should perform are the following:

- to perform the cadastral activities in compliance with the law;
- to maintain geodetic survey, cartographic and cadastral archive ("Geokartfond"), that shall - under routines established by the Law on State Archive Stock - accept, store and furnish for use geodetic, cartographic, cadastral and other materials and data;
- to ensure co-ordination of the cadastral activities with the other state geodetic/survey and cartographic activities;
- to develop and maintain a national standard for digital maps;
- jointly with the competent state body for metrology, to organize metrological control of the geodetic measurement equipment;
- to ensure maintenance of the qualification of employees;
- to keep register of the persons competent to exercise activity for the cadastre;
- to handle the co-ordination of international information exchange that involves cadastral information.

Geokartfond is a department of the AGCC responsible for the activities concerning maps and national coordinates - maintaining maps, digital data, disseminating and publishing data. It provides maps of scale 1:5000, geodetic coordinates for all control points of the National Geodetic Network and National Levelling Network.

2.2 Component 1: Coordination and organizational issues

The public GI-sector in Bulgaria is very fragmented. There are several government administrations that traditionally assume a dominant role as owners and users of spatial data. For example, the Agency of Geodesy, Cartography and Cadastre performs such functions with regards to cadastral databases.

The Agency of Geodesy, Cartography and Cadastre is responsible for the creation and maintenance of a National Integrated Collection of Geodetic, Cartographic, Cadastre and other data. The agency collects data from ministries and other organizations, such as the Border Police (administrative data of the country borders), the 28 administrative regions, the Ministry of Agriculture and Forestry (data of agriculture and forest lands), and others. However, Agency of Geodesy, Cartography and Cadastre has no obligations on producing administrative boundaries maps from such collected data.

In 2007, SAITC was assigned the coordinating role to build the Bulgarian SDI. Partners are the different ministries that produce and use spatial data, the specific state agencies, regional and local authorities, etc. The collaboration with the private sector is also seen as important. This whole process of restructuring is still going on.

One pilot project with satellite images with attached thematic maps and other information which covers the main Trans-European Transport Corridors passing through Bulgaria is implemented in the web site. It is an example of how different stakeholders collaborate currently in the joint effort to build the Bulgarian SDI. The Spatial Data Base is developed by the Agency for Sustainable Development and Eurointegration (ASDE), Remote Sensing Application Centre - ReSAC, The National Institute for Meteorology and Hydrology, The Institute for Biology, The Institute for Geology, the Sofia University – FMI, DataMAP Ltd. and other organizations. The Pilot project is open for cooperation with other bodies, working in the field of spatial information. The Pilot project Data Base will be transferred to State Agency for Information Technology and Communications, according to a Frame agreement with ASDE. Ministry of Transport, Information Technology and Communications will be involved in the process of thematic data collection, organization and updating. The final solution for data organization and service providing depends on the future cooperation between Bulgarian responsible bodies, EU structures and INSPIRE future development.

With a resolution of the Council of Ministers, form 31.01.2008, the implementation of INSPIRE requirements in Bulgaria is assigned to the State Agency for Information Technology and Communications (SAITC). An Inter-ministerial Working Group for the implementation of the INSPIRE directive has also been set up.

SAITC is the appointed institution at national level for transposing the Directive. A specialized legislative act which is in the process of approval will regulate the involvement of various national institutions in maintaining the respective registers and databases in the country. In implementation of this act, MoEW will have to bring the respective registers and environmental databases in compliance with the requirements of the Directive and to submit to EC and JRC the package of metadata for them. So are other Ministries and their GI databases.

Although an implementation plan does not exist (under preparation) yet several initiatives towards that have been undertaken: Specifically:

- The Decision of the Council of Ministers determines the responsibility of the President of SAITC authority (with the administrative changes in the new government, the responsibility is taken by the Ministry of Transport, Information Technologies and Communications) for the transposition and implementation of the INSPIRE Directive;
- The Decision N:19/ 31.01.2008, p.2 of the Council of Ministers accepted the program to provide integrated spatial data in Bulgaria;
- By order N: P-75/ 17.09.2007 of the Prime Minister an Expert Working Group was established to prepare a draft law on access to spatial data. The draft law

was approved by the Ministry Council in 23 December 2009 and shall enter in force in 2010.

2.2.1 Conclusions of Component 1

The Bulgarian SDI and INSPIRE approach is truly national. In 2007, SAITC was assigned the coordinating role to build the Bulgarian SDI. Partners are the different ministries that produce and use spatial data, the specific state agencies, regional and local authorities, etc. The collaboration with the private sector is also seen as important. This whole process of restructuring is still going on. The Agency of Geodesy, Cartography and Cadastre is responsible for the creation and maintenance of a National Integrated Collection of Geodetic, Cartographic, Cadastre and other data. Although there is now a clear direction by the Ministry of Transport, Information Technology and Communications and more specifically Executive Agency "Electronic Communications Networks and Information Systems", and other agencies are involved, as well as the stakeholders, it is not steered by the latter and the way they are involved in the coordination is not so clear. The public sector is clearly playing a dominant role but in the elaboration of the strategy (for example), universities and private sector are involved. However, this is still in an initial stage.

Based on these conclusions we score the indicators as follows:

- The approach and territorial coverage of the SDI is truly national
- One or more components of the SDI have reached a significant level of operability (Partially, 2)
- The officially recognised or de facto coordinating body of the SDI is a NDP, i.e. a NMA or a comparable organisation (Not so clear)
- The officially recognised or de facto coordinating body for the SDI is an organisation controlled by data users (No)
- An organisation of the type 'national GI-association' is involved in the coordination of the SDI (No)
- Producers and users of spatial data are participating in the SDI (Partially)
- Only public sector actors are participating in the SDI (Partially)

2.3 Component 2: Legal framework and funding

2.3.1 Legal framework

The April 2000 *Law of United Cadastre and Property Register* established the Cadastre Agency. Next, the Geodesy and Cartography Act, which had already passed a first reading in Parliament in 2001, was adopted on 23 March 2006. Pursuant to that Act, the Cadastre Agency was transformed into the Agency of Geodesy, Cartography and Cadastre (AGCC). The law deals with the organization, funding, administration and fulfilment of activities in the area of geodesy and cartography carried out by the executive state administration, local self-management and private and legal persons. The main activities, the role of the state, and the rules of use and standardization of documents are defined. Licensing principles for people carrying out activities in the area of geodesy and cartography and ways to approve and control licensing are further defined in this law.

In 2008, the Council of Ministers adopted a Resolution to approve the Action Plan for the implementation of the INSPIRE directive and a Resolution to nominate SAITC as the institution responsible for the implementation of INSPIRE (Philipov, 2009). By a decision of the Council of Ministers of 23 December 2009 a draft law on access to spatial data has been approved.

The draft Spatial Data Access Act was developed by a group of experts from leading scientific institutions (Bulgarian Academy of Sciences, Sofia University), the State Agency for Information Technology and Communications, companies producing and administering spatial data. The draft Act was agreed with all ministries and was submitted to the National Assembly. The Act is expected to be passed in the beginning of 2010.

In general, the future Spatial Data Access Act will stipulate the establishment and operation of an infrastructure for spatial information, the provision of access to spatial data and the provision of spatial data services. Major role regarding the state policy in the field of SDI, national contacts with the European Commission, regulation and control over the infrastructure for spatial information, will be played by the minister of transport, information technologies and communications. He will be assisted by the Executive Agency “Electronic Communication Networks and Information Systems” and the Inter-departmental Council on Spatial Data. One of the main responsibilities of the Executive Agency “Electronic Communication Networks and Information Systems” is the establishment and operation of the national portal for spatial data. The main function of the Inter-departmental Council on Spatial Data is to offer the minister methodological management for the establishment, implementation, operation and use of the infrastructure for spatial information.

[\(http://www.esmis.government.bg/\)](http://www.esmis.government.bg/)

2.3.2 Public-private partnerships (PPPs)

The regulations issued by the Ministry of Regional Development and Public Works convey rights to the municipalities to assign tasks to companies and other organizations for collecting geodata in their own areas. Local data could also be produced by private companies, schools and other organizations.

2.3.3 Policy and legislation on access to public sector information (PSI)

The Access to Public Information Act (APIA) was adopted on 22 June 2000. Secondary legislation was issued by the Prime Minister and the Minister of Public Administration in December 2000.

The Public Administration Act (2000), the Civil Servants Act (2001) and the Code of Conduct of Civil Servants (2001) all regulate public administration in conjunction with APIA, making clear the responsibility of the public administration and its servants to provide information to both private citizens and corporate bodies. This leaves room for the private sector to acquire public information and to process and repackage it in an electronic format.

Directive 2003/98 on the re-use of PSI was transposed by the Act amending the Access to Public Information Act of 7 June 2007. The Environment Protection Act 2002 was harmonized with the Aarhus Convention and directive 2003/4 on access to environmental information.

2.3.4 Legal protection of GI by intellectual property rights

The Bulgarian Copyright Act was adopted in June 1993 and entered into force on 1 August 1993. It was amended several times since. The cabinet approved amendments to the Copyright Act in line with Directive 96/9/EC on the legal protection of databases in 2000.

The law of copyright defines the ownership of geographical information and geodata. There are two important issues concerning spatial data:

- (1) the producers of the maps (topographical, geographical, cadastral or others) possess the copyrights for these maps, and
- (2) the owner of all results obtained from the fulfilment of tasks funded by the state is the state.

Creating a digital model of the territory by digitizing existing maps is, by law, a copy of these maps, and therefore, it is forbidden.

Bulgaria's preparation for accession to the EU included the transposition of Directive 2001/29 on copyright in the information society by the amendment of the Copyright Act in 2003.

2.3.5 Restricted access to GI further to the legal protection of privacy

Article 32 of the Bulgarian Constitution describes the inviolability of individual privacy, while Article 33 protects the home, and Article 34 protects communication.

In 1996 the government began developing data protection legislation in preparation for integration into the EU Internal Market under the Treaty for Association of Bulgaria to the EU. The Personal Data Protection Act was adopted by Parliament on 21 December 2001 and is in force since January 2002. Directive 2002/58 on privacy and electronic communications has been included in the data protection legislation.

2.3.6 Licensing framework

No information has been found.

2.3.7 Funding of AGCC and pricing policy

Funding

In general, state funding is the major source of funding, used mostly for the execution of projects, and supported by donor organizations such as the World Bank or the European Commission's Phare programme. No concrete recent information has been found.

Pricing

According to a survey carried out in 2003, most data providers charge for their data by licensing or by charging a price that corresponds to the market value. Some national administrations use a marginal cost model for selling data.

2.3.8 Conclusions of Component 2

In 2008, an Action Plan for the implementation of the INSPIRE directive and a Resolution to nominate SAITC as the institution responsible for the implementation of INSPIRE was drafted. It appoints responsibilities and gives direction. Beginning of 2010, a draft Spatial Data Access Act was ready. Directive 2003/98 on the re-use of PSI was transposed by the Act amending the Access to Public Information Act of 7 June 2007. However, it is not clear if it contains explicit reference to GI. There are laws that relate to privacy, but it is not clear if they also take into account the holders of GI. The framework for sharing will be based on INSPIRE legislation, but how this policy will look like is not

yet known. Moreover, it is confirmed in the survey that there is not yet specific funding for INSPIRE & NSDI but it is under discussion.

Based on these conclusions we score the indicators as follows:

- There is a legal instrument or framework determining the SDI-strategy or – development (In Preparation)
- There are true PPP's or other co-financing mechanisms between public and private sector bodies with respect to the development and operation of the SDI-related projects (Not so clear)
- There is a freedom of information (FOI) act which contains specific FOI legislation for the GI-sector (Not so clear)
- GI can specifically be protected by copyright (No)
- Privacy laws are actively being taken into account by the holders of GI (No Information found)
- There is a framework or policy for sharing GI between public institutions (No)
- There are simplified and standardised licences for personal use (No Information found)
- The long-term financial security of the SDI-initiative is secured (No)
- There is a pricing framework for trading, using and/or commercialising GI (No)

2.4 Component 3: Data for themes of the INSPIRE annexes

2.4.1 Scale and resolution: European, National, Regional, Local, Other

A vision of creating a National Strategy for cadastre and property register has been defined and discussed. The main point is the gradual creation of a United Information System for Cadastre and Property Register as a guarantee for privacy and a base for electronic management. The necessary steps for its creation would be the development of a national cadastral database - as a State guarantee and control on the property. This cadastral database would bring together the cadastral data of all departments. Local authorities, having access to the centralized cadastral database would have a common platform and source for legal information available.

In Bulgaria, a series of digital cadastral databases is available, most of which are the responsibility of the Agency of Geodesy, Cartography and Cadastre while some of the data are created by other agencies:

- Topographic maps are being digitized for the whole country. The series at scale 1:5.000 and 1:10.000 are the responsibility of the AGCC. The series at scale 1:25.000 and smaller are the responsibility of the Military Topographic Service of the Ministry of Defence (1:25.000, 1:50.000, 1:100.000, 1:200.000 and 1:500.000);
- The cadastre databases are developed by the AGCC: the agricultural and forest cadastre are digitized for the whole territory in scale 1:5.000 and 1:10.000. The urban cadastre for approximately 10%. This is a large scale database (between 1:1.000 and 1:500 the agriculture data currently held by the Land Commissions is of varying quality. Major problems occur where rural data and municipal data are combined. The cost of converting the Land Commission data and entering it into the new information system will be paid under the Registry and Cadastre project. The Agency of Geodesy, Cartography and Cadastre and the Ministry of Agriculture and Forestry (MAF) will be recipients of that data.
- Two types of Digital Elevation Models are available for the whole country: based on the topographic maps in scale 1:50.000, and using Shuttle Radar Topography Mission – SRTM
- In addition, a geological database is available as well in digital format for the whole country (created by MoEW): 1:500.000, 1:100.000 and 1:25.000 for areas with high geological potential. There are several other digital geological maps (uranium deposits, ground magnetic maps, ...);
- Data on Administrative units are provided by the Agency of Geodesy, Cartography and Cadastre, ;
- CORINE Land Cover data at scale 1:100.000 exists for the whole territory;
- City plans for some settlements are available in the Municipalities and in the regional offices of AGCC.

2.4.2 Data by resolution or scale range for the INSPIRE themes

GISEE project, a project financed by the European Commission in its fifth framework programme for RTD was making an inventory of the analogue and digital GI available for south-east Europe in general and Bulgaria in particular. In Bulgaria it was based on a questionnaire survey. Data from 28 questionnaires provided by research organisations, private companies and local and national authorities were processed. The final results of the survey are available but rather confusing with respect to the analogue or digital nature of the available GI and to the ownership. Therefore the overview of available digital data in the following table has an indicative value only.

The topographic maps are available, also partially in digital format. Most of the digital data are available as vector databases.

A lot of effort has been devoted to the building of the new spatial datasets. Regarding the three INSPIRE annexes addressing the 34 spatial data themes, a complete list will be presented in the updated report including the information provided by the country in 2010.

2.4.3 Geodetic reference systems and projections

Reference systems include: WGS84, System 1942, System 1950 and System 1970. The parameters of the local systems are considered to be military secret. This causes several practical problems as was the case for the MoEW preparing the NATURA 2000 programme for Bulgaria.

The Baltic coordinate system 1970 divides Bulgaria into four independent zones (k3, k5, k7, k9) without any spatial reference between them.

Within the New Cadastre and Property Register, a new GPS control grid will be developed. It will consist of 430 control stations spread over the country: one station per 250 km² or a control station within a range of 10 km from each location.

2.4.4 Quality of the data

Data quality is considered to be an important issue. However, no formal test procedures seem to be in use. In the Cadastral project, quality assessment will take place in the process of digitizing the urban cadastre and when matching it with the property data of the rural areas.

The GISEE study states that part of the topographic maps and orthophotos are not of recent date and that update is an important issue that has not been resolved yet.

The cadastre system uses unique real property identifiers which make the link between the parcels and buildings in the cadastre possible and consistent.

2.4.5 Interoperability

Different commercial GIS software is used throughout Bulgaria: ESRI-products mostly, followed by MapInfo and AutoCad software. SICAD and Geomedia are only very recently on the market but are not used often. Bulgarian software packages for the creation and processing of cadastral data on settlements and farmlands, CADIS and MCAD, respectively, are also widely used. For the cadastre system SQL server and ArcSDE is used as well.

For the New Cadastre and Property Register, data acquisition and digitization will use the national exchange standard for cadastral data. There are two Bulgarian standards for data exchange: CAD-format, published on the Web-page of the Agency of Geodesy, Cartography and Cadastre, and ZEM-format, published on the Web-page of the Ministry of Agriculture and Forestry.

2.4.6 Conclusions of Component 3

Although Bulgaria has several datasets, some described in the report, only few are described in the official INSPIRE MR, so it is proposed not to change the indicator. Reference systems include: WGS84, System 1942, System 1950 and System 1970. The parameters of the local systems are considered to be military secret. This causes several practical problems as was the case for the MoEW preparing the NATURA 2000 programme for Bulgaria. Data quality is considered to be an important issue. However, no formal test procedures seem to be in use. Focus of the interoperability is still a lot on data exchange formats.

Based on these conclusions we score the indicators as follows:

- Geodatasets exist which provide a basis for contributing to the coverage of pan-Europe for the INSPIRE-selected data themes and components (Partially)
- The geodetic reference system and projection systems are standardised, documented and interconvertible (Partially)
- There is a documented data quality control procedure applied at the level of the SDI (Partially)
- Concern for interoperability goes beyond conversion between different data formats (Partially)
- The national language is the operational language of the SDI (No Information found)
- English is used as secondary language (No Information found)

2.5 Component 4: Metadata

2.5.1 Availability

Metadata exists only for a very small part of the data that has been digitized.

2.5.2 Metadata catalogues availability + standard

The European pre-standard developed by the CEN TC 287 has been translated in Bulgarian and is accepted informally as the standard to be used. It is not clear however to what extent it is used in practice. According to the GISEE-study, metadata are available in one research organization only where they are stored in a 'private' format and used for internal purposes only.

A SmartSDI (<http://212.122.187.251/SmartSDI/index.action>) information system was developed in conjunction with a project of SAITC under the Operational Programme Administrative Capacity: 'Creating organizational and technological prerequisites for operational reconciliation (OS) of Geographic Information Systems (GIS) and geo - spatial data (GPD) in Public Administration of the Republic of Bulgaria, GA GIS'.

SmartSDI system allows for the collection of information (metadata) of available structures in public administration geo-spatial data and services and their administrators. The system provides an opportunity for intelligent search and review the set of entries in the metadata. System access is allowed only to registered users. (Only in Bulgarian)

2.5.3 Conclusions of Component 4

No new information became available to allow us to find metadata catalogues or metadata. Rather the current situation is confirmed by the INSPIRE MR where out of the 281 reported data sets 10% have metadata.

Based on these conclusions we score the indicators as follows:

- Metadata are produced for a significant fraction of geodatasets of the themes of the INSPIRE annexes (No)
- One or more standardised metadata catalogues are available covering more than one data producing agency (No)
- There is a coordinating authority for metadata implementation at the level of the SDI (No Information found)

2.6 Component 5: Network services

2.6.1 On-line access service for metadata: discovery services

Not available.

2.6.2 OpenSource software for access services

Most of the software used is based on a variety of proprietary formats and de facto standards. International standards are not yet used, but it is envisaged to go more to those in a new SDI initiatives (regional Atlas of south-east Europe); Web Services Modelling Language, semantic web (including Xlink), XML, GML, RDF and UML for system modelling.

2.6.3 Availability of viewing services

Within the EU funded project Nature-GIS, a node of a GIS portal has been established to visualize data from protected areas in Bulgaria (<http://gis.biodiversity.bg>). The portal is built using WMS and WFS software according to OGC specifications.

The website <http://www.bgmaps.com> which is mentioned in chapter 1 was created by the private company DOMINO SLTD. The activity is oriented towards the development and implementation of multimedia products and technologies, web development, publishing of cartographic products, business catalogues, etc. DOMINO has developed the official website of 75 Bulgarian municipalities and maintains them. DOMINO made maps of cities of Bulgaria, detailed road maps of Bulgaria, maps of the Bulgarian resorts, etc. Everything is accessible through their website. Currently the webpage is under the DATECS GIS Centre Company. In 1998 DATECS GIS Centre developed its own technology for presenting maps in Internet and for a long period of time www.sof-info.com and www.bul-info.com services were one of the most visited Bulgarian web pages. Both of them were suspended for some time, but this service is available since 2003 at www.bgmaps.com.

For some of the information, search functions are implemented (place names).

Everyone can add - free of charge – his own URL link to the web page www.bgmaps.com. The service “virtual server” is paid and it offers a map made by [bgmaps.com](http://www.bgmaps.com) appearing via a link in one’s webpage and is showing the location of one’s company. A get link capability is also available via the [bgmaps.com](http://www.bgmaps.com).

Moreover, a blog has been added to the website (<http://blog.bgmaps.com/>) in Bulgarian where the recent updates are mentioned.

The newly launched web site <http://www.Emaps.bg> is a web site for online geo services and maps. www.Emaps.bg provides online geo services, dynamic relief map for the territory of Bulgaria, detailed maps for the territory of more than 20 cities and resorts in Bulgaria as well as contacts and location of thousands of useful places for tourism, business and living. The site offers its users the tools to find addresses in the cities and the unique service to find routes in the cities.

A portal for spatial data on the Trans European Transport Corridors is developed as a joint action of SAITC and ASDE. Currently no information on its status is available, while some thematic maps are present at: <http://bsd.asde-bg.org/proj/lccs.php> (only in Bulgarian).

Moreover the cadastre provides a service to translate geographical names from Cyrillic to Latin and vice versa (<http://www.geomatics-bg.com/transliterate.php>).

Furthermore, an on-line service and information system of reference of land registers- (www.icadastre.bg) is available.

On the <http://smes.asde-bg.org/bedstvia.phtml> website a number of map services exist (only in Bulgarian) providing information of Floods, Earthquakes, Forest Fires, 3D models and Disasters and accidents. Specifically, a map service (<http://smes.asde-bg.org/index2.php>) offers relevant, continuously expanded thematic information for a variety of risks from natural disasters in GIS format, maintained by SAITC, ASDE and ReSAC.

2.6.4 Availability of catalogue services to regulate access

Not available.

2.6.5 Availability of catalogue services that perform payment operations

Not available.

2.6.6 Availability of catalogue services to extract and send data to a user application

Not available.

2.6.7 SDI user applications

The use of digital spatial data is mainly focused on land registry and cadastre applications. There exist several projects, many of them funded by the international donor community. This could be the basis for a wider future use of GI in the areas of agriculture, transport, tourism, etc. There are also several projects in the area of environment: projects to monitor the water quality of cross-country rivers like the Arda, Mesta and Struma (Bulgaria-Greece). In addition, there are some projects applying GI & GIS in utilities, construction and telecommunications.

In the study of Boes and Pavlova, there is an estimation of the GIS application areas. It is estimated that 20% of the applications deal with digital map production, 16% with controlling cadastre, 13% with control information systems (agricultural control LCCS), 10% with law cadastre, 9% with geodetic control, 7% for tools for mapping and 7% for air photography, 4% for the space triangle system and 14% for others (environment, ...). So, according to these figures, the applications are still focused a lot on GI/GIS management areas, and less on end-user applications.

The development of the Bulgarian SDI is project oriented and focuses on environmental applications.

2.6.8 Availability of geo-processing services

Not available.

2.6.9 Conclusions of Component 5

Bulgaria has not a discovery service to search for data through metadata. Although the GIS-Nature BG node has been build using WMS, it is not clear whether this operational, no evidence found.

Based on these conclusions we score the indicators as follows:

- There are one or more discovery services making it possible to search for data and services through metadata (No)
- There are one or more view services available for to visualise data from the themes of the INSPIRE annexes (Not so clear)
- There are one ore more on-line download services enabling (parts of) copies of datasets (No)
- There are one or more transformation services enabling spatial datasets to be transformed to achieve interoperability (No)
- There are middleware services allowing data services to be invoked (No)

2.7 Component 6: Thematic environmental data

2.7.1 Application of the legal framework and funding principles (for reference & core thematic data) to thematic environmental data

There are some other laws with importance for spatial data, such as the Environmental Protection Act (State Gazette No. 86/1991; amended in April 2000). The environmental framework law will transpose the provisions related to environmental impact assessments (EIAs), integrated pollution and prevention control (IPPC), the Seveso II Directives, and will ensure the basis for implementation of the eco-labelling and EMAS Regulations. It also contains provisions with respect to access to environmental information. However, distribution of information related to the environment is mostly done via reports and bulletins.

2.7.2 Application of reference data & core thematic data characteristics to thematic environmental data

The Environmental Executive Agency has created a national information system on the different aspects of the environment. It has a hierarchical structure and includes the creation of local databases in the RIEWs (Regional Inspectorates of Environment and Waters) and a national database in the EEA. The system's aim is to create an overall environmental information network which is organised, has applied software and databases, is compatible with other networks and is centralised. Almost 80-90 percent of environmental information is kept by the MoEW and its various branches; the RIEWs and EEA in particular. The information system is under development, but the data that is available is stored in electronic form (60 percent) and on hard copy. Three types of database software are operated: MS Access, dBase and Oracle. Since the different databases are not compatible, it is envisaged that in the future, the available information will be processed entirely by Oracle.

In addition there is a National System for Environmental Monitoring (NSEM) which is also administrated by the Environmental Executive Agency. It covers the whole country and supports a database on both national and regional levels. The system provides timely and reliable information on environmental matters. On this basis, analyses, assessments, and prognoses for activities relating to preservation and conservation of the environment are prepared. The primary data from the local networks of the NSEM is obtained through automated stations and conventional sampling sites. After reliability assessment, this information is submitted to local databases via manual or automated input. Following the necessary processing, the information is transferred via telex to the BEEA. At present, real-time data is valid only for the automatic stations for gamma-background radiation and for two of the air quality stations. Monitoring data is centralised in the National Database of EEA which is not currently integrated by components.

EUROAIRNET incorporated Bulgaria into the EU Environmental Monitoring and Information Network of the EU (concerning air pollution) in 1997. Forty-two measuring points from NSEM are included in the European network. This information is collected, processed and reported on by the BEEA in terms set out by the European Environment Agency.

The MoEW has already prepared the NATURA2000 framework. Therefore it uses intensively the CORINE Land Cover database which forms, together with the field inventories the basis for the definition of the NATURA 2000 network (Bird and Habitat Directive). A database on biotopes was developed as well.

The Nature-GIS project, a project also funded by the European Commission within its fifth framework program, aims at making spatial data regarding protected areas at pan-European scale available. Bulgaria and the whole south-east of Europe are included in the project.

While the leading responsibility for implementing the INSPIRE Directive in Bulgaria is at present with the State Agency for Information Technology and Communications (2009), the Ministry of Environment and Water is responsible for assuring adequate implementation the environment-related themes under the Directive, and has already reported all spatial data held in relation to the INSPIRE Directive.

The Executive Environment Agency (ExEA) is the administration reporting to the Minister of environment and water which is responsible for performing leading, coordinative and informative functions regarding the control and protection of environment in Bulgaria. The Agency designs and manages the “National System for Environment Monitoring and Information on the State of the Environment’s Factors and Components”, for the country’s whole territory. The ExEA organizes and maintains the National System for Monitoring of Biodiversity (NSMB), respectively database and information system for biodiversity and register of the protected areas (<http://eea.government.bg/zpo/index.jsp>). Within the range of NSMB are established specialized schemes for monitoring of the protected areas. ExEA reports annually to the European Environment Agency (EEA) for the Central Database of Designated Areas (CDDA, http://www.eionet.europa.eu/dataflows/pdf2008/flow_summary?flow=CDDA1), which contains information about the protected areas by IUCN codes, boundaries, surfaces, etc. (from TWINNING LIGHT PROJECT FICHE paper)

The TWINNING LIGHT PROJECT: Title: Preparing to implement the environment-related themes of Directive 2007/2/EC “INSPIRE” with focus on Annex I.9 “Protected Areas has a wider objective to assure adequate and timely implementation of the INSPIRE Directive 2007/2/EC in the environment sector in Bulgaria.

The Specific objectives are:

- Elaborate and agree between the responsible institutions a realistic work-plan for implementing the Inspire Directive for Annex I “Protected Areas” and the further environment-related themes in Bulgaria
- Assure a good-quality and timely metadata inventory for the first relevant environment-related theme Annex I “Protected Areas” for Bulgaria
- Assure good technical co-operation on the environment-related Inspire themes between the Bulgarian Environment administration and the Joint Research Centre of the European Commission

2.7.3 Application of metadata issues identified for reference data and core thematic data to thematic environmental data

A National Catalogue of Data Sources was developed and added to the MoEW’s web page in December 2001. The Catalogue is a Meta database, containing information on who holds environmental information in Bulgaria, what kind of information is available and how users may access it.

2.7.4 Conclusions of Component 6

While the leading responsibility for implementing the INSPIRE Directive in Bulgaria is at present with the State Agency for Information Technology and Communications (2009), the Ministry of Environment and Water is responsible for assuring adequate implementation the environment-related themes under the Directive, and has already reported all spatial data held in relation to the INSPIRE Directive. The data reported under INSPIRE MR are mainly environmental geodata.

Based on the information provided on the previous paragraph we score the indicator as follows:

- Thematic environmental data are covered by the described SDI-initiative or there is an independent thematic environmental SDI

2.8 Standards

No information was found.

2.8.1 Conclusions of Component 7

No information was found. However, the 2007 score was in agreement and we keep it as is although no evidence has been found for the current situation (data spec development, application of OGC standards ...)

Based on these conclusions we score the indicator as follows:

- The SDI-initiative is devoting significant attention to standardisation issues

2.9 Use and efficiency of SDI

Bulgaria is involved in a number of international projects:

One of the results of the Bulgarian-French project BulgaRisk related to the application of satellite imageries for risk management for natural disasters like floods and forest fires, is the creating and commissioning of Internet based system of satellite imageries over the territory of Bulgaria, with spatial resolution of 2,5 m. The service is available on: www.spotmapsbulgaria.com.

Bulgaria is part of the EnviroGRIDS @ Black Sea Catchment project. The project has a 4 year duration starting from April 2009 and is funded under the FP7. EnviroGRIDS aims

at building capacities in the Black Sea region to use new international standards to gather, store, distribute, analyze, visualize and disseminate crucial information on past, present and future states of this region, in order to assess its sustainability and vulnerability. To achieve its objectives, EnviroGRIDS will build a Grid-enabled Spatial Data Infrastructure (GSDI) becoming one of the integral systems in the Global Earth Observation System of Systems (GEOSS), and compatible with the new EU directive on establishment of an Infrastructure for Spatial Information in the European Community (INSPIRE), as well as UNSDI developments (<http://www.envirogrids.net/>).

ReSAC (Remote Sensing Application Centre) offers services in the area of earth observation applications, GIS, orthophoto mapping as well as consultancy for projects and tasks within this scope. It is involved in a number of FP7-EU and other international projects such as Geoland2, SAFER, COSMOS, etc (<http://www.resac-bg.org/en/projects.html>).

3 Annexes

3.1 List of SDI addresses / contacts for Bulgaria

Table: SDI contact list			
SDI Name	Web address	Organisational mailing address	Over-all contact person: tel./fax/e-mail
National			
Inter-ministerial Working Group (IMWG) INSPIRE Directive			Mr. Petar Iliev – Secretary IMWG piliev@daitsgovernment.bg Kristian Milenov - k.milenov@stalkerkm.com Mr. Ivan Filipov - ivan_filipov@mail.bg
SAITC	http://bsdi.government.bg	6, Gourko Str., Sofia 1000	Mr. Petar Iliev - director of IDN Department in SAITC, - piliev@daitsgovernment.bg Ms. Lilyana Turnalieva –Head of Department “Spatial databases” in SAITC lturnalieva@daitsgovernment.bg
ASDE	http://asde-bg.org http://bsdi.asde-bg.org/	9, Kokiche str. Sofia 1164	Mr. Kristian Milenov, Executive Director, asde@online.bg ;
Agency of Geodesy, Cartography and Cadastre	http://www.cadastr.bg	1 Musala Str, BG-1618 Sofia	Mr. Tzveten Boev, acad@cadastr.bg
URSIT Ltd (GI-consulting company)	http://www.ursit.com	Vishneva Street 22 1164 Sofia, Bulgaria	Mr. Ulrich Boes office@ursit.com Tel./Fax +359 2 8702878 GSM +359 (0)98 536 750
Ministry of Environment and Waters (MoEW)	http://www.moew.government.bg	22 Kniaginia Maria Luiza Blvd, BG-1000 Sofia	info@moew.government.bg

Ministry of Agriculture and Forestry (MoAF)	http://www.mzgar.government.bg	55 Hristo Botev Blvd., BG-1040 Sofia	press@mzgar.government.bg
Executive Agency Electronic communications networks and information systems	www.esmis.government.bg		Tel./Fax: +359 949 21 15 + 359 981 87 87 Lilyana Turnalieva lturnalieva@esmis.government.bg Todor Dragostinov tdragostinov@esmis.government.bg

3.2 List of references for Bulgaria

Table: list of references used to compile the Country Report	
Web sites:	
	http://www.mrrb.government.bg/inbrief.php.htm
	http://www.urisa.org/Journal/Vol14No2/craglia/geographic_information_policies_in_central_and_eastern.htm
	http://www.eurogeographics.org/AboutUs/index.htm
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	http://www.aidaa.org/aidaa/tp/phare/bg.htm
	http://195.228.254.144/program.html
	http://egeols222.egeo.sai.jrc.it/Workshops/6ec-gis/papers/boes.doc
	http://egeols222.egeo.sai.jrc.it/Workshops/7ec-gis/presentations/dallemand.pdf
	http://www.bgmaps.com
	http://www.datecs.bg
	http://www.datamap-bg.com
	http://www.meteo.bg
	http://www.soils-bg.org
	http://www.resac-bg.org
	http://www.geology.bas.bg
	http://www.md.government.bg
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	http://www.ursit.com/all/nasdi/presfirstday.html
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	Karadjova, E., Impact of the EU directives in the national practices –

	towards INSPIRE implementation in Bulgaria. Available at: http://www.cadastre.bg/presentations_files/ . Accessed in April 2010.
	Philipov, I., and Milenov, K., 2009. Directive INSPIRE transposition in Bulgaria. INSPIRE Conference. June 2009 Rotterdam.
	Boes, U., 2008. Spatial Data Infrastructure Development in EU. National PSI Meeting 2008, Sofia Bulgaria.
	Carlo Travaglia et al., 2001. Preparation of Land Cover Database of Bulgaria through Remote Sensing and GIS, 2001, FAO.