

INSPIRE Impact in Urban Engineering and Regional Development

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Abstract

The paper presents a project coordinated by the Urban Engineering and Regional Development Department within the Technical University of Civil Engineering Bucharest dedicated to the implementation of INSPIRE directive in Romania for two particular, but yet inter-related, fields of activity: urban engineering and regional development, on one hand, and urban cadastre on the other hand. The project was completed in July 2006 and resulted in a proposal for a law that defined the way INSPIRE will be implemented in these two fields of activity. Taking into account the present stage of the INSPIRE implementation Romania, the result of the project is still actual and is currently taken into account by the national central authorities.

Keywords: INSPIRE, SDI, NSDI, GIS, urban engineering, regional development, urban planning, regional planning, spatial data, spatial database, disaster management, waste management, construction and demolition waste management, spatial planning

1. INTRODUCTION

The present paper represents a report that describes a research project and its implications in the actual context of INSPIRE framework directive transposition in Romanian legislation. Also, the impact of INSPIRE in urban engineering and regional development is considered.

In Romania, there are several on-going activities, relevant to the creation of the national spatial data infrastructure that include but are not limited to: INSPIRE Working Group, which is a registered LMO for Romania, National Biodiversity Project, Water Framework Directive Implementation, IACS/LPIS implementation project.

The deadline for INSPIRE transposition into Romanian legislation is dated in mid May 2009 and the INSPIRE Working Group already made a proposal for a Government Decision that is currently under analysis.

Throughout the paper the term urban engineering and regional development will be encountered having a meaning close to urban and regional planning. Nevertheless, it is important to make the distinction between them. Thus, urban engineering and regional development may be considered as one of the operational components of urban and regional planning. It should be mentioned that from the point of view of the national spatial data infrastructure the two terms are comparable because they require the same information infrastructure.

The paper emphasizes urban engineering and regional development because all of the authors are members of the Urban Engineering and Regional Development of the Technical University of Civil Engineering Bucharest and, therefore, are more familiar to the issues of this field of activity. This is also the reason why two special application domains are treated in distinct subsections of the paper: disaster management and, on the other hand, construction and demolition waste management.

The paper is structured in 5 sections as follows.

Section 2 is dedicated to SICUAT - The National Program for GIS Implementation in Urban Cadastre, Urban and Regional Planning. SICUAT was intended to be the main instrument for INSPIRE transposition in urban cadastre and urban and regional planning. Thus, many provisions within the proposed legal act are in close connection with the INSPIRE framework directive and, of course, its transposition in the Romanian legislation.

Section 3 deals with INSPIRE Impact in Urban Engineering and Regional Development. It mentions specifically the thematic layers that are to be considered within the framework of urban engineering and regional development. The section includes three subsections: 3.1. INSPIRE Transposition for Urban Engineering and Regional Development, 3.2. Impact of INSPIRE for Disaster Management in Romania, 3.3. Impact of INSPIRE in Construction and Demolition Waste Management in Romania.

Section 4 presents the conclusions of the paper, while Section 5 includes the main references used within the paper.

2. SICUAT – THE NATIONAL PROGRAM FOR GIS IMPLEMENTATION IN URBAN CADASTRE, URBAN AND REGIONAL PLANNING

SICUAT was initiated in October 2004, a few months after the date INSPIRE proposal was presented. SICUAT is the acronym for the National Program for GIS Implementation in Urban Cadastre, Urban and Regional Planning.

The project was one of the priority research projects, co-financed by the Ministry of Research and Education. The project was subordinated to INSPIRE objectives. The beneficiary, Ministry of Transportation, Constructions and Tourism (MTCT), defined the Terms of Reference of the project. It is worth mentioning that the Ministry has changed its name, structure and competence after the general election in 2008. Nevertheless, for the sake of legibility the acronym MTCT will still be used.

The Technical University of Civil Engineering Bucharest won the competition with a project oriented to designing and building a national spatial data infrastructure for urban cadastre and urban and regional planning. The Urban Engineering and Regional Development Department of the university was charged with the project implementation.

The project ended in July 2006, almost a year before the date when INSPIRE became a framework directive.

The main partners of the project consortium were:

- Technical University of Civil Engineering Bucharest (coordinator)
- Faculty of Civil Engineering
- Faculty of Geodesy
- INTELIGIS Ramnicu Valcea

Also, there were three mandatory partners:

- National Centre for Geodesy, Cartography, Photogrammetry and Remote Sensing
- National Institute for Statistics
- National Institute for Urban and Regional Planning – URBANPROIECT

General objectives of the project were:

- To ensure logistic support for EDIS (Extended Decentralisation Implementation System);
- To develop advanced techniques and tools for spatial planning in Romania, in accordance with European Union sustainable development requirements;

- To implement the strategies and policies for the development and improvement of monitoring the national level of development.

Specific objective of the project consisted in drawing up a:

- Proposal for a legal framework in order to promote the National Program for GIS implementation in urban cadastre and urban and regional planning

Project had four phases:

- Phase 1: Analysis of the current situation (2004)
- Phase 2: The strategy and priorities of SICUAT (2005)
- Phase 3: Ex-ante evaluation of SICUAT (2005)
- Phase 4: Proposal of the legal framework that promotes SICUAT (2006)

Feedback and control was ensured during the project as follows:

- Project web page, <http://sicuat.utcb.ro>. (The web page will be re-activated at the beginning of May 2009.)
- Project web page maintenance
- Workshop „The strategy and priorities of SICUAT ” (phase 2)
- Workshop „Actual status of SICUAT” (phase 3)
- Workshop „SICUAT – current status and future developments” (phase 4)
- Internet public consultation

Two important activities dedicated to creation and maintenance of spatial data sets were included within the project:

- Dataset for urban cadastre
- Updating of the RURBAN spatial database (Petrescu et al, 2002)

3. INSPIRE IMPACT IN URBAN ENGINEERING AND REGIONAL DEVELOPMENT

The impact of the INSPIRE framework directive in UERD is closely related to its transposition in Romanian legislation. The main impact will take place in clarifying all the aspects of implementing the spatial data infrastructure.

In particular, for urban engineering and regional development there are several thematic layers mentioned within the three annexes of the directive, which will be considered by the competent public bodies as follows:

- Annex I
 - Protected areas
- Annex III
 - Buildings

- Utility and governmental services
- Area management / restriction / regulation zones and reporting units

The transposition of the INSPIRE directive will enable a series of clarification processes related to important issues such as:

- What are the national datasets that have to be created?
- Who is in charge for the creation and maintenance of each dataset?
- When will be available the datasets?
- Who will be responsible for the national geo-portal and who is responsible for departmental geo-portals?
- What will be the national data exchange format standards?
- How will be distributed the responsibilities between the main stakeholders of the national spatial data infrastructure?

Finally, it should be mentioned that a certain role for sharing best practices and success stories in urban engineering and regional development could be represented by EUKN – European Urban Knowledge Network (www.eukn.org).

3.1. INSPIRE Transposition for Urban Engineering and Regional Development

INSPIRE transposition for urban engineering and regional development is part of general INSPIRE transposition process. SICUAT provides important instruments for assisting this process. The main tool is represented by the proposal of the legal framework. To illustrate this, its contents is presented in the following:

- Need for a national spatial data infrastructure in urban cadastre
- Need for a national spatial data infrastructure in urban engineering and regional development
- Romanian legislative framework related to urban cadastre
- European legislative framework related to urban cadastre
- MTCT tasks in urban cadastre
- Romanian legislative framework related to urban engineering and regional development
- European legislative framework related to urban engineering and regional development
- MTCT tasks in urban engineering and regional development
- NACLR – National Agency for Cadastre and Land Registration tasks
- SWOT analysis
- Structure of a generic GIS for urban cadastre in Romania
- Structure of a generic GIS for urban engineering and regional development in Romania

- SICUAT implementing measures
- Annex: feasibility study

A special mention deserves SWOT analysis for urban engineering and regional development that is presented in the following:

- Strengths
 - The national legislative framework for urban engineering and regional development
 - The documentations dedicated to urban and regional planning in accordance to national legislation
 - There are master plans for about 99.9% of the administrative units of the country; these plans represent an important data source for the information systems, and particularly, for the geographic information systems dedicated to urban and regional planning.
 - The use of graphic software for final results presentation.
 - Local initiatives for the use of GIS technology in public administration.
- Weaknesses
 - Lack of qualified personnel in using of GIS technology in local and central public administration bodies.
 - Lack of qualified personnel in using of GIS technology within the organizations that design and achieves the documentations for urban and regional planning
 - There is not enough qualified personnel for GIS education and training
 - Lack of up-to-date topographic support
 - Lack of GIS software both within local and central public administration bodies and within the organizations that design and achieve the documentations for urban and regional planning
 - Lack of the IT/GIS component from the methodology dedicated to the design of documentations for urban and regional planning
 - Difficult access to data
 - Lack of comparable and compatible data formats
- Opportunities
 - SICUAT national program implementation
 - Implementation of Law 7/1996 for Cadastre and Land Registration
 - European Union integration
 - INSPIRE framework directive transposition
 - GMES/Kopernikus program
- Threats
 - Frequent changes of legal provisions

- Different software systems that provide outcomes, which cannot be shared and compared
- Disfunctionalities in public administration

Finally, an important component of SICUAT is represented by the implementing measures recommended to the beneficiary, as follows:

- General implementation measures for SICUAT
 - Adoption of data exchange formats for (digital) geo-spatial data at national level
 - Adoption of strategies for data security for the geographic information systems used within public administration
 - Metadata creation and maintenance
 - Building of a national system for raising awareness, training and professional skills improvement in using IT and GIS for urban engineering and regional development.
 - Correlation between national spatial data infrastructure in urban engineering and regional development and implementation information technologies in public administration
 - Inter-institutional cooperation
 - Building of official datasets having national coverage
 - Systematic allocation of financial resources
 - Constant support from public administration decision makers
 - Cooperation between the owners/managers of urban/regional/national network utilities
 - Stability of personnel
- Specific implementation measures that rest with MTCT
 - Coordination of national spatial data infrastructure in urban engineering and regional development
 - Cooperation with NACLR for building a digital topographic support at national level
 - Permanent communication with all stakeholders involved in building the national spatial data infrastructure for urban engineering and regional development.

3.2. Impact of INSPIRE for Disaster Management in Romania

In recent years, natural and human activity generated disasters became a more and more important issues all over the world. Floods, tsunami, earthquakes, hurricanes, explosions, land slides, accidental polluting emissions in atmosphere,

and so many other critical events are present in the mass-media almost every day. The governments have taken important measures for disaster management.

Urban engineering and regional development is closely related to disaster management because it deals with all the structures that are vulnerable at different types of disasters. In this respect, INSPIRE has an extremely important role as any human intervention after the disaster must be based on accurate and updated geo-spatial data.

In Romania, this fact is recognized as a core factor for any sub-system or component included within the national disaster management system. In order to give a general idea about the main issues related to disaster management in Romania we include in the following a few paragraphs from (Gaman et al, 2003).

Disaster management includes:

- Prevent and attenuate the effects of potential disasters
- Anticipated preparedness
- Real-time response and urgent intervention
- Re-establishment of vital functions
- Reconstruction and insurance against potential damages

Main obstacles related to the use of geo-spatial data:

- Existing data are not enough, do not have the requested quality and often are incomparable
- Lack of common/exchange data format
- Data are not aggregated on the same type of territorial units
- Data collection very slow

Unfortunately, the issues identified in 2003 are still actual. INSPIRE transposition may give a new impulse for providing effective solutions, at least at organizational level.

3.3. Impact of INSPIRE in Construction and Demolition Waste Management in Romania

Waste management is one of the most important issues of the contemporary civilization. For urban engineering and regional development, a special interest field of activity is construction and demolition waste management. This is due mainly to the increasing construction activity in Romania in the context of European structural funding.

Thus, by means of structural instruments, various infrastructure works are under current development all over the country. As a natural consequence, the volume of construction and demolition waste is increasing. The construction and demolition waste management became an important problem for the public administration and, in recognition of its importance, a specific Government decision is under current preparation.

At the same time, the integration within European Union means also to transpose the European legislation and, of course to apply it. For the time being, the legal provisions have been assimilated within the Romanian legislation and, consequently, the organizational framework is under current development.

The role of INSPIRE framework directive is critical regarding the construction and demolition waste management because of the importance of the geo-spatial data for this activity. Taking into account the complexity of the problem, the geo-spatial data infrastructure is need in almost its every component as waste management has an important spatial characterization. Thus, from identifying the optimum placements for the ecological landfills till the monitoring of dangerous/contaminated waste transportation the role of spatial data infrastructure is crucial.

To present the main elements characterizing the construction and demolition waste management, we include a few paragraphs from (Iacoboaia et al, 2009).

Thus, the options for waste management, according to The National Strategy for Waste Management, show the following decreasing order of priorities:

- prevention of occurrence - by applying "clean technologies" in waste generating activities;
- quantity reduction – by applying the best practices in each waste generating activity domain;
- recovery – by re-using, material recycling and energy recovery;
- elimination – through incineration and disposal in a safe manner.

National strategic objectives specific to construction and demolition waste are:

- Support the re-use and recycling of uncontaminated construction and demolition waste
- Treat contaminated construction and demolition waste in order to recover or eliminate
- Develop the facilities system for proper elimination

The National Strategy for Waste Management and the National Plan for Waste Management describe in detail the construction waste management as follows:

- Construction and demolition waste (contaminated and not-contaminated)
- Waste from soil excavation (contaminated or not)
- Road construction waste

4. CONCLUSIONS

INSPIRE impact in urban engineering and regional development includes mainly two elements:

- Improve the decision processes
- Increase the structural funds absorption

Improvement of the decision processes relies on main INSPIRE components. Of course, this will happen not directly but by means of national legal provisions that will transpose the directive. A special mention has to be made in connection to data and to metadata. The deadlines for achievement of the themes included within the three annexes will create a clear objective to main public data providers at national level. Following the celebrated sentence "better data for better decisions" it results that the main qualitative impact of INSPIRE will be accomplished in this way.

European integration by using the structural instruments is one of the major priorities of the Romanian society at large. Urban engineering and regional development plays an important role in this process as it deals intrinsically with the infrastructure works. Having a national spatial data infrastructure will enable the applicants to draw up relevant projects aiming at national development by using structural funds. In this way, the absorption rate of structural funds will increase constantly.

Finally, at present the SICUAT outcomes are re-considered by the actual central authorities in order to adapt them to the actual context of the process of INSPIRE transposition in Romanian legislation.

5. REFERENCES

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