BRISEIDE: the case study on Indicators for Environmental Quality to reach Urban Welfare – IQ2U

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This paper presents the case study on Indicators for Environmental Quality to reach Urban Welfare – IQ2U , a prototype developed within the BRISEIDE International Project.

BRISEIDE is an ICT Policy Support Programme project BRISEIDE is supported by the CIP / ICT Policy Support Programme of the European Commission. It involves 15 EU partners and it aims to develop spatio-temporal web processes for geospatial application.

In order to promote and test and these spatio- temporal web processes, IGP is developing a case study based on building spatio-temporal indicators to monitor urban areas evolution within the Portuguese regulation framework context.

This case study evaluates the evolution of urban areas, according to land use planning regulation framework, and compares the urban extension planned areas with the urban areas evolution in order the understand if witch extension the evolution of land use accomplishes the planning assessments.

In a second stage, the project uses some simple socioeconomic and environmental indicators to understand the population needs within these areas, and relates them with land use in order to build evolution scenarios for landscape transformation and help decision makers and researcher understand in which extent the changes in landscape reflect population requirements and sustainable development for these areas.

The spatio-temporal web processes created for BRISEIDE will de used as collaborative tools within the planning process as well as tools for results dissemination.

PALAVRAS-CHAVE

Urban planning, indicators, BRISEIDE, Web, INSPIRE

1. BRISEIDE AND THE IQ2U PROTOTYPE

BRISEIDE is an ICT Policy Support Programme project within EU's. It involves 15 EU partners on the development of spatio-temporal web processes for geospatial application.

The spatial analysis developed tools will be accessible on the Web and will be available within compatible Web GIS applications.

Recent developments achieved within relevant INSPIRE related projects or Standard services will be analysed and explored in order to provide access to relevant existing geodatabases, restructured or enriched with additional data in order to accomplish the different user requirements.

The BRISEIDE relevant deliverables include:

1. Time aware extension for data models developed within relevant INSPIRE related projects;

2. Value added services for spatio-temporal authoring, analysing, processing and visualization of information;

3. Application prototypes based on the integration of existing user operational information in order to achieve specific research goals.

The case study on Indicators for Environmental Quality to reach Urban Welfare – IQ2U, presented in this paper is one of the BRISEIDE application prototypes that is being developed with IGP collaboration.

2. The IQ2U application project

2.1. IQ2U - main goal

The IQ2U project, Indicators for Environmental Quality to reach Urban Welfare, (Osmanagić A., Trigila, A. Et all (2010) – intends to evaluate urban growing and its impact in environmental quality in order to promoted more effective land use planning approaches.

It will contribute to better understand in which extent the planning process has been relevant in promoting quality of life and welfare in urban areas.

This project will also help understanding in what extent the INSPIRE Directive as been relevant for information dissemination and access, namely related to land use planning; and sustainable development achievements

Doing so IQ2U will allow a better understanding of fitness for purpose related to existing information. It will also clarify the knowledge about the cost of unbalanced urban growing, and will help building more sustainable and equity approaches in terms of management of land use and natural resources.

2.2. DETAILED DESCRIPTION

The purpose of this scenario is to evaluate urban growth and its impact on environmental quality in order to support a more effective land use and spatial planning.

Through a set of indicators, the scenario intends to better understand at what extent spatial planning has/is relevant in promoting quality life and welfare in urban areas.

The pilot project includes the following areas of interest:

1. The dam of Castelo do Bode surrounding area, a main rural area (Figure 1)

2. The Metropolitan Lisbon Area - one of its Municipalities (Figure.2).

Figure 1: Dam of Castelo do Bode surrounding area

Figure 2: Trancão River and its surrounding area

The project aim consists in the evaluation of the urban growing from 1990 to 2007, taking into account two areas with different landscape contexts: one more rural, presented as example in Figure 1, and another mainly urban, presented as example in Figure 2.

Evaluation of effective urban growing will be based on different available datasets, cartographic and alphanumerical, for these selected areas.

The cartographic information datasets should describe the urban landscape evolution, from 1990 to 2007. The alphanumeric will give an over view on some environmental quality indicators and demographic evolution.

The IQ2U project includes: the Portuguese land use maps from 1990 and from 2007 (Figure 3), and the orthophoto images taken for the same areas, covering the same time period (images similar to those presented at figure 1 and 2 above).

The user should be able to access these data sets and, based on the temporal information and study area delimitation, should be able to select the needed subset of information, land use maps and orthophoto images, and alphanumerical related data.

To evaluate urban land use evolution and build urban growing indicators, it is essential to have access to historical series of dataset and compare them.

The selected cartographical datasets will produce different delimitation of the urban areas and will allow users to evaluate their evolution in a different detailed approach, considering these different time periods and different datasets based approaches.
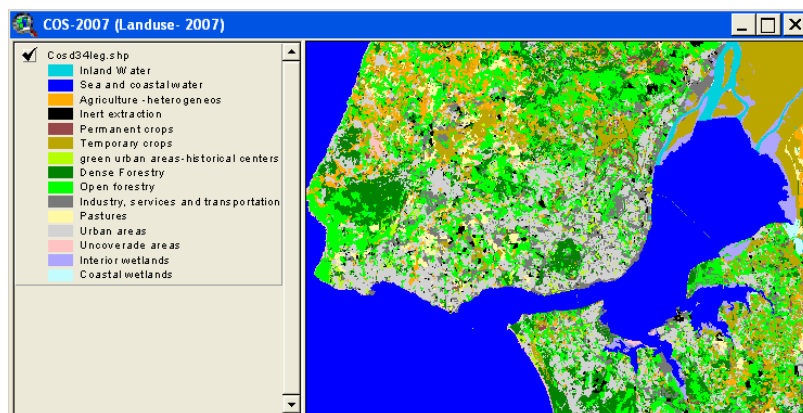

Figure 3: Extract of the Portuguese land use-map, Cos 2007.
The COS 2007 is IGP property is 1 ha detail. It allows, by comparison with the COS 1990, to evaluate the evolution of urban areas in Portugal

The quality of the final results for monitor urban evolution also differs. Once created the dataset which contain the urban growth the user should be able to perform some different analysis in order to understand how the urban growth relates to demographical evolution and environmental quality.

Two different kind of analysis will be able to be performed within IQ2U prototype application:

1. The first analysis explores the relation between the spatial planning and the urban growth. For this reasons the users should have access to the urban planning dataset and compare the data available with the created dataset. The user can be able to evaluate the overlap between the two identified areas.

2. The second analysis is related to the impact of urban growth in environmental quality. The user can access to the information related to the air or water quality also considering results coming from different EU funding projects approaches namely related to water quality framework directive implementation (Figure 4).
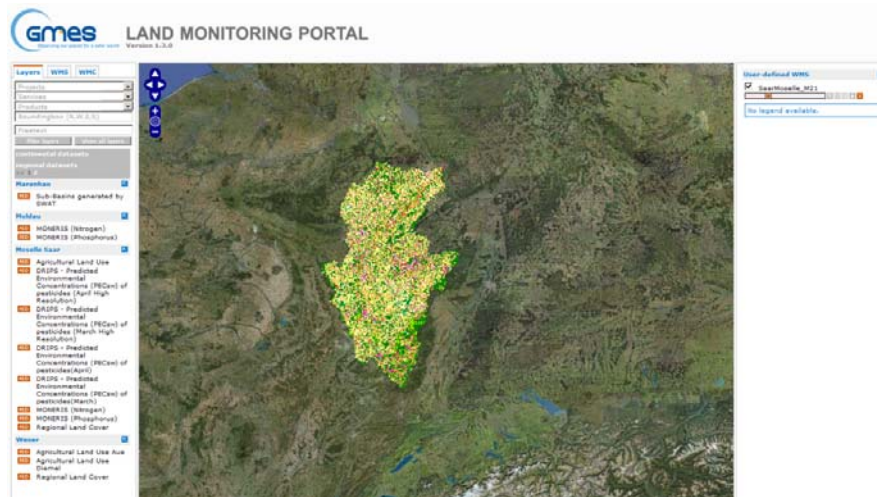

Figure 4: Water quality layer provided in GMES Land monitoring portal (não sei se podemos usar esta imagem

In addition to this analysis the operator will access statistical data produced by the Instituto Nacional de Estatistica –INE (National Statistical Institute)) and retrieve significant information, using adequate time series within different demographic datasets, as the example shown in Figure 5.

Local de residência	Densidade populacional (N.º/ km²) por Local de residência; Anual
	Período de referência dos dados
	2008
	N.º/ km²
Grande Lisboa	1 475,0
Amadora	7 237,2
Cascais	1 933,1
Lisboa	5 777,8
Loures	1 151,8
Mafra	243,0
Odivelas	5 828,0
Oeiras	3 758,1
Sintra	1 396,8
Vila Franca de Xira	447,5

Densidade populacional (N.º/ km²) por Local de residência; Anual - INE, Estimativas Anuais da População Residente

Última actualização destes dados: 07 de Setembro de 2009

Figure 5: Table of population density, accessed as services by INE portal

2.3. RELEVANCE OF THE ANALYSIS CONSIDERING IQ2U MAIN GOAL

The main results of this use case will be the assessment of the following features:

1.   Urban area growing within the last ten years.

2.   Population growing and its relation to urban soil classification.

3.   Air quality evolution towards urban growing.

4.   Water quality evolution towards land use planning - urban growing.

5.   Urban growing –demographic analysis.

The approach will consider relevant Local 21 Agenda approaches within International and National context described at ICLEI and at the Portugal Agenda 21 Local web Portal, (UCP,2010)

The analysis will produce a set of indicators using the approach described by Partidário, R. (2000), and by Vale, M.J. and Papudo, Rui , (2007).

The relevance of this analysis is to clarify the evaluation of fitness for purpose of different datasets produced and available to implement UE environmental directives framework, namely INSPIRE Directive and Water Framework Directive (Directive 2000/60/EC) and Air Quality Directive (Directive 2008/50/EC). The results are mainly relevant for the datasets included in the above description.

The analysis can be expanded for the datasets available for monitor the Portuguese reality evolution, taking into account mainly those related to the INSPIRE Directive- Annexes I and II (Directive 2007/2/EC).

3. CONCLUSION

The IQ2U project intends to explore developed BRISEIDE tools and use them to evaluate evolution of urban land use, in different landscape contexts.

It will allow evaluation of using different datasets approach to deal with urban landscape evolution and its impact in environmental quality, in order to promoted more effective land use planning approaches and evaluate information fitness for purpose.

Besides this goal IQ2U will also contribute to better understand in what extent the planning process has been relevant in promoting environmental quality in urban areas and their surroundings.

It will give a good contribution to INSPIRE Directive implementation namely within the Portuguese context and can propose relevant improvements dealing with geographical information.

Doing so it will contribute to understand the relevance of understanding information quality and its reliability for properly understand urban growing, in a more realistic approach.

4. REFERÊNCIAS

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