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Initial organizational studies on national Spatial Data Infrastructure at government level

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Abstract

A Spatial Data Infrastructure (SDI) is a coordinated series of agreements on technology standards, institutional arrangements and policies that enable the discovery and use of geospatial information by users for a range of purposes. While SDIs have economic, social and environmental benefits, they require inter-disciplinary organizational, coordinated studies to preserve the ecology and for sustainable development. Turkey is moving towards a spatially enabled society underpinned by a national geo-spatial data infrastructure, called TNSDI (Turkish National Spatial Data Infrastructure). In this article, the initial organizational studies and action plans in Turkey for TNSDI are described.

Keywords: NSDI; geospatial; government; organization; action plans.

1. Introduction

A Spatial Data Infrastructure (SDI) is a framework of spatial data, metadata, users and tools that are interactively connected in order to use spatial data in an efficient and flexible way. It is also technology, policies, standards, human resources and related activities necessary to acquire, process, distribute, use, maintain and preserve spatial data [9]. It is a part of e-government strategy. National Spatial Data Infrastructure (NSDI) is a national effort that

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has come to be seen as the technology, policies, standards and people necessary to promote geospatial data sharing throughout all levels of government, the private and non-profit sectors, and academia. It provides a base structure of practices among data producers and users. However the organization and coordination among all levels are the important ones.

In Europe, a major recent development has been the entering into force of the INSPIRE (Infrastructure for Spatial Information in Europe) Directive in May 2007, establishing an infrastructure for spatial information in Europe to support policies or activities which may have an impact on the environment. The Directive addresses 34 spatial data themes needed for environmental applications [4].

Turkey is moving towards a spatially enabled society underpinned by a national geo-spatial data infrastructure, called TNSDI (Turkish Spatial Data Infrastructure). Until now, initial studies about TNSDI concentrated on the INSPIRE directive. The General Directorate of Land Registry and Cadastre (GDLRC) under the abolished Ministry of Public Works and Settlement had been responsible for the initial NSDI studies and coordination.

2. Benefits of Spatial Data Infrastructures (SDIs)

SDIs have economic, social and environmental benefits. The most important economic benefit of SDIs is the promotion of economic growth as a result of an expanding market for geographic information products and services (such as navigation systems) both locally and internationally. The remarkable economic value in public-sector information comes directly from geographic information sources. Estimates of the growth of the commercial geographic information market are more readily available. Also, the impact of SDI on job creation is considerable. An SDI allows publishing and managing the spatial data online to link the data and services with the others. People have important roles to develop technology behind the web services and network facilities, standards and policies on SDI. Increased efficiency and lower operating costs for both public and private sector organizations due to wider access to geographic information and information-based services are other economic benefits of SDIs.

The most important social benefit of SDIs is the contribution to more efficient and more transparent government at all levels as a result of the increasing availability of authoritative data for policy and decision makers. SDI facilitates the access, use and distribution of spatial data. SDI development is a partnership between government organizations. The total amount of time is needed to search the spatial data and to transfer spatial datasets into a different format. Thus the data sets are made available to third parties. SDIs bring together data from many diverse sources. Also they lead to better arrangements for homeland security and more effective systems for emergency planning and response, and there are many operational benefits for social services, public health, education and public safety from more effective targeting of areas and groups with special needs.

SDIs have an important role to play in promoting sustainable development throughout the world and to bring many environmental benefits. At national and local levels, they provide the data required for effective management and monitoring of natural resources [6].

One example of the socio-economic impacts of SDI is the Catalonia SDI which is described in the JRC (Joint Research Center) Scientific and Technical Report. It outlines time and money saved, and provides details of the political and social outcomes [1]. This study was undertaken in 2007 and the major advantage of the methodology proposed is based on the expected benefits of the investments in three main categories of e-government: efficiency impacts, efficacy impact and democracy impacts. These categories include cashable financial gains, better empowered employees, better organizational and IT (Information Technologies) architectures, openness, transparency and accountability, participation, reduced administration burden, increased user value and satisfaction, and more inclusive public services [2].

3. Action plans at government level in Turkey for SDIs

The need for spatial data has also been increasing in Turkey as in the rest of the world. Spatial data is the basis of Geographic Information Systems (GIS). GIS is a kind of data processing in every field in society and a component for national data processing policies [16]. SDI is the infrastructure for GIS and its aim is to facilitate the exchange and sharing of spatial data and to provide coordination among users. At an administrative level, it provides the appropriate environment for decision making with technological support. Its role is to supply an active and effective

environment for achievement of organizational goals for producers and users [7]. The organizational component of SDI is assumed as the highest level of the policies of commissions at administrative level to decide the plans and programs. Organization is one of the most important components of the SDI among others such as legal, capacity building, data, technology, standards and specifications, human capital, will, and producer and user components [8]. Spatial data has an important role in sustainable development and also is a required component of e-government. Therefore daily more people want to access spatial data via the Internet [5].

To benefit from information technologies for sustainable development at a national level, SDI is needed. The studies on NSDI in Turkey have been going on since the early 2000's in the name of Action 47, Action 36 and Action 75 [10, 11, 13, 14].

3.1. Action 47 and organizational studies

In the concept of The Prime Minister's Office Notice dated as 04.12.2003 (No. 2003/48), the e_government Transformation Turkey Project Short Term Act Plan came into force. Action 47 was an "Initial Study for Turkish National Geographic Information System (TNGIS)" and had been executed with the responsibility and coordination of the General Directorate of Land Registry and Cadastre (GDLRC) with participation of 32 public institutions, 9 municipalities and 3 universities. In this report, the geographic information system studies in our country and abroad (such as in Finland, Canada, Belgium, France, Ireland, Germany, Australia, New Zealand) had been investigated and the detailed analysis for the existing situation had been made. Also, institutions/organizations on GIS facilities at international level were researched: EUROGI, GINIE, GSDI, INSPIRE, AGILE, EuroGeographics, PCGIAP, EuroSDR, and FIG-Commission3. Also, studies on development of standards for GIS and studies on building coordination among institutions/organizations were realized. Eleven sample GIS studies from institutions/organizations in Turkey were reported. In addition to these, the problems and the expectations had been determined.

The Action 47 Report was completed and sent to the T.R. Prime Ministry State Planning Organization (SPO) after application term. Because SPO has a duty to monitor the implementation of long-term plans, short-term plans and annual programs to evaluate the implementation of the plans and if required to advise proper amendments. Finally the report on Action 47 was prepared in January 2005 and the Application Plan for 2005 had been suggested [11]. Then the "e-Transformation Project in Turkey, Act Plan for 2005" came into force on 1st April, 2005 as an appendix to the High Planning Committee Decision dated on 24th March, 2005.

3.2. Action 36 and organizational studies

The Action 36 was another action article for the Action Plan for 2005. It was for "Initial Infrastructure Studies for National Geographic Information Systems in Turkey".

In the scope of Action 36, three commissions were constituted: Commission1-Standards Commission was to determine the TNGIS standards, and procedures and data scope. Commission2-Technical Infrastructure Commission was to determine TNGIS communication Infrastructure. Commission3-Administrative/Legal Infrastructure Commission was to determine TNGIS institutional organization principles, TNGIS institutional duty and responsibility principles and TNGIS legal arrangement requirements. Commission1 consisted of 51 people, Commission2 consisted of 22 people and Commission3 consisted of 20 people from different institutions/organizations, universities and the private sector. Finally, three reports were presented: Data and Standards Commission Report, Technical Infrastructure Commission Report and Examples from the World on Administrative and Legal Infrastructure [10].

3.3. Action 75 and organizational studies

After Action 36, the National Information Society Strategy and its appendix, which was "Action Plan for 2006-2010", came into force on 28th July 2006 to determine policies and steps for the information society. In "Action Plan for 2006-2010" there was an important title "Modernization in Public Management (MPM)" that aimed to develop cooperation and interoperability among public institutions, to decrease resource waste, to increase productivity

during work processes, and to develop policy and decision processes based on information and communication technology. In the same Action Plan, Action 75 was situated under the title MPM. Action 75 was projected as "Establishing Geographic Information Infrastructure". In the scope of the action, it was aimed to determine the concept of the geographic data and the standards of data exchange and to create a portal that provides sharing geographic information [3]. Action 75 was replaced in GDLRC budget as a Research Project.

When this action was under responsibility of GDLRC with T.R. Prime Minister's Office Note numbered 2003/48, "E-transformation Executive Council" was formed. According to Chief Executive Council Decision (dated as 21.02.2007), the Steering Committee was generated. Then Contact Units (Contact People) were determined in all spatial data related institutions/organizations. To coordinate the studies among all of them, the Project Execution Office was constituted under responsibility of GDLRC. The aim was to create a portal to serve the geographic information for which the institutions are responsible, and to determine the content and exchange standards [3].

In the concept of this action, the procurement document for consultancy services was completed by the Technical Committee and presented to the Steering Committee on 17-18.12.2008. On 16.12.2009 the Agreement for Service on Feasibility Research to Establish Turkish National Spatial Data Infrastructure (TNSDI) was signed by TURKSAT A.Ş [13, 14]. Before the official completion of the report of the Awareness Meeting of The Project for Steering Committee and Technical Committee and the workshops for the contact people from each related organization/institution were arranged. During this feasibility study, the Project Executive Office organized the meetings for TURKSAT A.Ş. to analyse the spatial data and GIS studies and it contributed to the meetings. In this respect, 11 ministries and 4 municipalities, including 51 institutions were visited. The members of the Technical Committee visited several European countries - Germany, Netherland, Finland, Norway, Italy, and Spain - to see the SDI samples.

After completion of the feasibility report, but before its presentation to SPO, it was introduced to all committee members in a one-week workshop to get the last comments, and then the final corrections were made.

During this action plan a geo-metadata portal was created [12, 15].

4. Results

SDIs improve national and local governance, and provide more opportunities to engage in the democratic process, more effective homeland security, and faster emergency responses. As initial reasons, SDIs have environmental benefits such as promoting sustainable development and better natural-resource monitoring and management. They require inter-disciplinary organizational studies to preserve the ecology and sustainable development, and to coordinate the commissions and institutions.

Turkey is on the way of SDI studies. In this paper, only the organizational environment for NSDI in Turkey in recent years is mentioned. Each institution creates its own data and dataset. However, one of the most important points is "organization and coordination" among institutions concerning how these data can be served. Until now organizational studies on NSDI at government level have been executed under coordination of the GDLRC.

5. Discussion

Turkey has executed the SDI studies by selecting INSPIRE as a guide for TNSDI. Also, the commission studies and the feasibility report studies have continued under GDLRC that has the main responsibility for cadastre and ownership until July, 2011. To develop the NSDI studies more rapidly and more productively, one organization/institution should have the mission and this organization/institution should have the main responsibility of geographic information systems and SDI. Also the legal arrangements for the spatial data infrastructure and geoportal should be made as soon as possible.

6. Conclusions

It is known that SDIs have social, economic and environmental benefits. Therefore the infrastructure should be established as soon as possible. This infrastructure has an interdisciplinary study with technology, standards, policy, organization, etc. After organizational studies on NSDI in Turkey have been executed under coordination of

GDLRC among institutions and commissions, General Directorate of Geographic Information Systems (GDGIS) is established under the Ministry of Environment and Urban Planning with the Decree numbered 644 that is published on the Official Gazette dated as 04.07.2011. The main duty of this general directorate is to establish, use and develop National Geographic Information Systems, and to make and to support the studies and processes for this aim. Hereafter GIS and SDI studies will continue under the control and leadership of GDGIS. It has been studying on preparation of the legal infrastructure and draft theme identification documents. The drafts for address, land cover, building, hydrography, administrative unit, geodetic establishments, orthophotos, land registry and cadastre, topography and transportation are completed and presented on web site [17].

References

[1] Almirall PG, Bergadà MM and Ros PQ. The socio-economic impact of the spatial data infrastructure of Catalonia. JRC Scientific and Technical Reports, Luxembourg, OPOCE; 2008. Available at http://inspire.jrc.ec.europa.eu/reports/Study_reports/catalonia_impact_study_report.pdf, accessed 01.03.2013.
[2] Craglia M and Campagna M. Advanced regional SDI in Europe: "Comparative cost-benefit evaluation and impact assessment perspectives. International Journal of Spatial Data Infrastructures Research, 2010; 5: 145-167.
[3] DPT (State Planning Organization). Bilgi Toplumu Stratejisi Eylem Planı. Ankara, Turkey: DPT; 2006.
[4] European Commission. INSPIRE website. Available at http://inspire.jrc.ec.europa.eu/, accessed 06.03.2011.
[5] Li P, Wui L and Xiao X. SDI in China: progress and issues. International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences, 2008; 37(B4): 7-10.
[6] Masser I. Building European spatial data infrastructures. USA: ESRI Press, Redlands, California; 2007.
[7] Paudyal DR and McDougall K. Building spatial data infrastructure to support sustainable catchment management. Queensland Spatial Conference, 17-19 July 2008, Gold Coast; 2008.
[8] Ramirez JO. The spatial data infrastructure of México "IDEMex". Proceedings of the FIG Working Week and GSDI-8, Cairo, Egypt; 2005.
[9] The White House. Office of management and budget. Circular No. A-16. Revised 19.08.2002. Available at http://www.whitehouse.gov/omb/circulars_a016_rev/ , accessed 27.02.2011.
[10] TKGM (General Directorate of Land Registry and Cadastre). Eylem36 Türkiye Ulusal Coğrafi Bilgi Sistemi (TUCBS) Oluşturmaya Yönelik Altyapı Hazırlık Çalışmaları Raporu. TUCBS politika ve strateji dokümanı (April). Ankara, Turkey: TKGM; 2006.
[11] TKGM (General Directorate of Land Registry and Cadastre). Eylem47 Türkiye Ulusal Coğrafi Bilgi Sistemi Oluşturulabilmesi İçin Ön Çalışma Raporu (January). Ankara, Turkey: TKGM; 2005.
[12] Yalcin G. Geo-metadata in spatial data infrastructure and e-governance. African Journal of Business Management. 2011, 5 (12): 4650-4656.
[13] Yalcin G, Erkek B and Bakici S. Spatial data infrastructure in Turkey and projects. FIG Working Week, Sydney, Australia; 2010.
[14] Yalcin G, Erkek B, Bakici S and Sahin N. Through spatial data infrastructure in Turkey. FIG Working Week, Eilat, Israel; 2009.
[15] Yalcin G and Bakici S. Metadata portal for maps in Turkey. International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences. 2008, 37(B4): 1605-1611.
[16] Yomralıoğlu T. Coğrafi bilgi sistemi politikası. TUJK CBS ve Jeodezik Ağlar Çalıştayı, Konya; 2003.
[17] http://www.csb.gov.tr/gm/cbs, 28.05.2013. Web site of General Directorate of Geographic Information Systems.