

NSDI AS AN ENABLING PLATFORM FOR FACILITATION OF LAND ADMINISTRATION FUNCTIONS IN VIET NAM

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KEY WORDS: NSDI, Land Administration, Land Reform

ABSTRACT: The core functions of land administration systems include the management of information on land tenure, land value, land use and spatial development in a local public sector context. In Vietnam, the implementation of land administration functions has gradually moved towards information architecture as part of the National Spatial Data Infrastructures (NSDI). This paper evaluates the development of a NSDI in Vietnam. The approach of this paper is a structured comparison of both completed and on-going projects in Viet Nam that involves both the technical choices of data standards, systems and architectures and the specific links to land administration functions. From the evaluation we derive that currently the NSDI development allows for the improvement of land related services to public sector users as well as citizens in a secure manner. However, as the implementation of the NSDI has recently started and is still underway of construction, the evaluation also shows that despite a common view on NSDI objectives, the implementation approaches are not in sync among agencies. There are two main factors which cause this quandary: technical constraints and legal constraints. Both types of constraints are crucial bottlenecks to properly align the land administration functions with the NSDI objectives. We conclude therefore that once the implementation of the core functions of the Land administration can be technically aligned with the NSDI objectives, and once the NSDI coordination mechanism can be resolved in Vietnam, it opens the way forward to a spatially enabled society and more transparent access to land information.

1. INTRODUCTION

At present, many governments and private agencies are moving towards creating and updating their spatially related management and services in which state organizations act as key producers of spatial data and as coordinators for sharing of spatial data and services (Williamson 2010). That comes up with the need to establish a platform for sustainable management of natural resources and overall economic development. The development of NSDI provides an enabling platform for facilitation of spatial services and assists for decision making process.

The initiatives of NSDI at each country came along with different name but they are all considered to be the most crucial part of its national information systems that provide access mechanism for all who use spatial data. There is a wide agreement that consider NSDI as a center for a spatially enabled society. However, the lack of policy and planning framework is a common obstacle for the implementation of NSDI in many countries (Masser 2007). Each country, mostly in the public sector, state agencies had built spatial databases on their own. The lack of coordination and sharing of data lead to duplication of collection, provision of data, and lead to incomplete database and poor data quality or non-standardized database. The benefits that come along with NSDI are a sharing mechanism between ministries and agencies that overcome the monopoly status in handling spatial data and avoid duplication in surveying, data collection and updating. The construction and development of NSDI in Vietnam (VNSDI) becomes a key component in development plan of an e-government and will be a strategic tool in the development of spatially-based natural resource decision support system.

In Viet Nam, however, as the implementation of the NSDI has recently started and is still underway of construction. The evaluation also shows that despite a common view on NSDI objectives, the implementation approaches are not in sync among agencies. There are two main factors which cause this quandary: technical constraints and legal constraints. The technical constraints include the matching of heterogeneous data models and the handling of technical contingencies of local information systems, while the legal constraints involve the legislation of standards and assignment of authorities on the coordination between central and decentralized administrations. Both types of constraints are crucial bottlenecks to properly align the land administration functions with the NSDI objectives.

2. SDI DEVELOPMENT IN VIETNAM

2.1 SDI Initiatives

With the realization that SDIs are complex infrastructures, there are numbers of views on SDI that reflect the evolutions of spatial data provision services with specific legislative conditions. SDI evolved when and how its components are categorized, depending on their role within the framework (Rajabifard 2002). A SDI must be more than a single dataset or database (Williamson 2010), fundamentally, it hosts geospatial data, description of data, mean of data transportation, attached services and organizational commitments to administer the sharing at all level scales. The pro-technical aspects focused on improving technical infrastructure for maximizing production, supply and transmission data and services or more user-centered services. On the other hands, social views push towards a common understanding on the instructional construction and consider SDI in term of social issues, including access, work processes, responsibilities, social embedding, securities.... In facts, SDI development involve much more than neither technical aspect nor social (non-technical) aspect, it requires addressing those two at the same time and the integration need to be framed in the context of each nation (Williamson 2010).

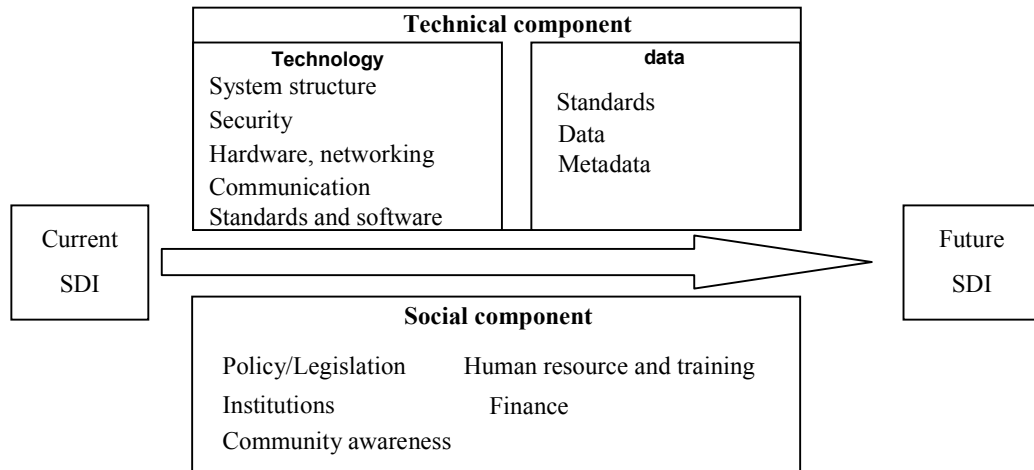


Figure 1: NSDI theoretical framework

Among numbers of SDI definitions that differ from each other, there are two views on SDI that are widely accepted and used. In SDI cookcook, Nebert defines SDI as “a relevant base collection of technologies, policies and institutional arrangements that facilitate the availability and access to spatial data” (Nebert 2004) . In the INSPIRE Directive Article 3, the European Parliament defines SDI as “metadata, spatial data sets and spatial data services; network services and technologies; agreements on sharing, access and use; and coordination and monitoring mechanisms, processes and procedures” (EU Parliament 2007). Balancing these elements facilitates both the intra and inter jurisdictional dynamics of spatial data sharing (Rajabifard 2002). The two above definitions that contain both technical and social components and processes, and develop through dynamic evolving processes with many distinct stakeholders. Common is however that the SDI institutions act as a platform where different actors can contribute and co-develop, even though the stakes and contributing stakeholders may be different. (Vries 2009)

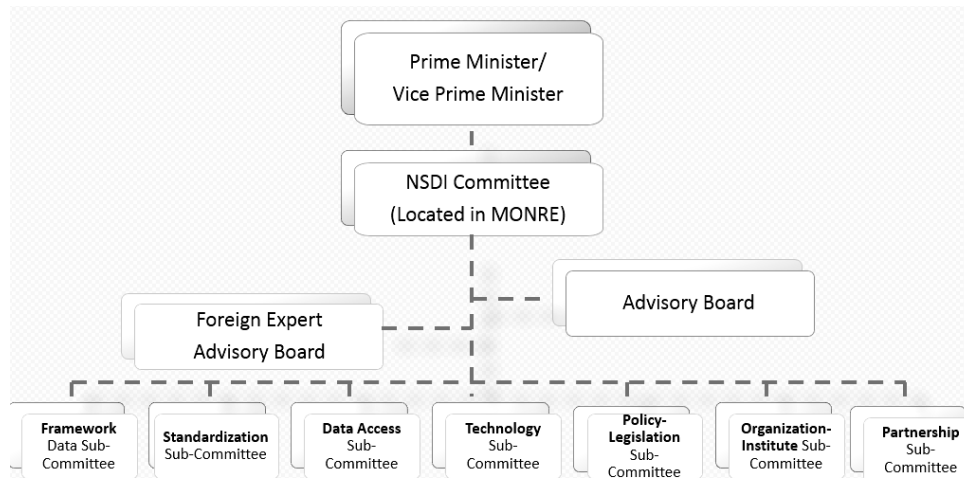


Figure 2: Prototype NSDI management system

The efficiency and benefits from a Viet Nam NSDI (VNSDI) is the sharing of geo-spatial data across the producers and users of geo-data and geo-information, avoiding silo-management of geodata and duplicated investments in

creating and updating data and information for correct and comprehensive decisions to be made. At present, when ministries are just developing their own specialized databases to serve the performance of their mandates, VNSDI is still something in the distance. Therefore, Ministry of Natural Resources and Environment (MoNRE) as the organization in charge of developing GIS infrastructures and standards, spatial, remote sensing and geodata techniques, will play an important coordinating role in designing, implementing and operating the VNSDI in the coming time (Tuan V.A 2009) (Figure 2). This is also the opportunity for recent Degrees by the Government regarding collecting, managing and using spatial data to be implemented with the best results. In fact, the Vietnamese government has recognized the severe lack of human capacity to transform the land sector and to realize the ambitious plans. This deficiency concerns both institutional and organizational aspects (land policy, land law, land administration and business administration) as well as appropriate technological systems (information management and technology, database management, geographical information systems and international standards).

2.2 SDI and Land Administration in Viet Nam

The designation of a land information system is aimed at providing tools for legal, administrative and economic decision-making and an aid for planning and development which consists one the one hand of a database containing spatially referenced land-related data for a defined area. On the other hand of procedures and techniques for the systematic collection, updating, processing and distribution of the data. The concept of ‘people-relevant data’ in the land administration field can provide richness to the implementation of SDI, which distinguishes it from the typically small-scale data in national, regional or global SDIs (Williamson 2003; Abdul Rashid Mohamed Shariff 2011). In another research, (Williamson 2010) also mentioned an efficient and effective Land administration system that support sustainable development requires an SDI to operate. A SDI provides platform for people – data connection that enables land administration services to function. (Figure 2)

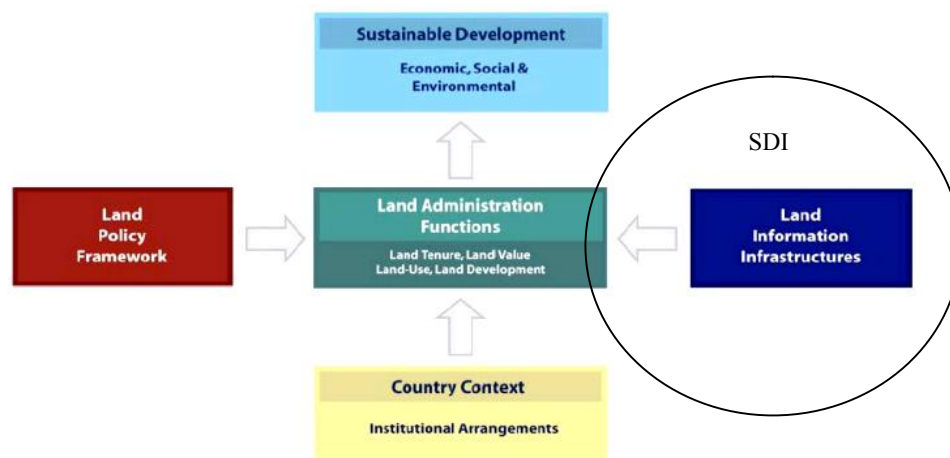


Figure 3: SDI and Land administration Arrangements in Land Management Model *Source:(Williamson 2010)*

As the Constitution of Vietnam specifies that all land is owned by all of the people of Vietnam and is uniformly administered by the State on behalf of the people. The State allocates land and leases land to various persons and entities, referred as “land users” in the 2003 land law, for stable and long-term use. The land administration structure is based on the hierarchical combination of levels of governments (state, province, district, and commune), in which land management operates in multi-level structure, a NSDI support a streamlined standard flow of data, which related to land administration activities, from national to commune level. Above all, MoNRE is mandated as the top organization for natural resources and environment management. It also became the top level of land administration in Vietnam, after the merge and restructure of the General Department of Land Administration and other organisations.

In reality, the Vietnamese economy experiences a very rapid economic growth. The absence of a proper and well-functioning land administration system turns out to obstruct investments to sustain this development. At the same time the deficiencies in land administration result in conflicts over land affecting in particular the poor in society. With a view to maintaining the pace of development and acknowledging the importance of a modern land administration system for national socio-economic development, the Vietnamese government had embarked on an ambitious programme of revising the land law in 2013 and developing a modern digital and automated land administration system and a VNSDI. Table 1 show how NDSI enables the implementation of the land administration core functions.

Table 1: VNSDI and Land administration activities

| Land Tenure | Land Use | Land Value |
|--|---|--|
| <p>Policy: Comprehensive land law, allocation of land use certificates in with the exception of a few protected areas</p> <p>Actors: Local authorities at provincial, district and commune level, officials at the village level (e.g. headman, party secretary), Land Administration Office</p> <p>NSDI supports LIS in all of its components: A complete land database, A software system and the functional operation processes, Human resources, Engineering infrastructure</p> | <p>An efficient and effective Land Information Infrastructure provides a consistent spatial database that overcome the current situation in Viet Nam, where land-use information is inconsistent in term of classification and construction methods (land-use information is produced by both ministry of natural resource and environment, and ministry of agriculture and rural development). Both acknowledge the need to create an integrated system.</p> | <p>The Government admits in finalizing land value identification procedure and in constructing national land value map and land value database for land governance and real estate development. Current LIS and future NSDI store land data and provides GIS functions to identify land value and to forecast the trend of property market and help the public decision on land investment. Technically and financially, a NSDI therefore provides well-coordinated platform for state agencies to handle land transaction</p> |

3. NSDI ANALYSIS

3.1 SWOT Analysis of NSDI in Viet Nam

In Vietnam, the most apparent driver of land information integration is land information transparency, hence SDI has been the information integration efforts that have been developed through land administration projects (Norval A. Young), all of which are mainly undertaken by MoNRE (Tuan V.A 2009). This research reviewed numbers of recent completed and on-going projects for identification of Strengths, Weaknesses, Opportunities and Threats (SWOT) to develop a NSDI. This paper focused on several completed and on-going projects, namely (1) Standardization of the basic national geodata system, (2) Building a national integrated Natural Resources and Environments (NRE) database” (3) Scientific and technological justifications for designing and developing SDI (4) Building geodatabase at 1:10.000 scale in combination with Digital Elevation Model for the whole country (5) Building geodatabase at 1:2.000 and 1:5.000 scales for urban, industrial and key economic areas (6) Building national marine database of baseline for the marine natural resource and environment of Vietnam (7) Vietnam Land Administration Project–VLAP. SWOT analysis is shown in Table 2.

Table 2: SWOT analysis of NSDI in Viet Nam

Adopted and edited from (Tuan V.A 2009)

| Strengths | Weaknesses |
|---|--|
| <ul style="list-style-type: none"> - Spatial databases are simultaneously updated at all level of administrative entities. - Latest Information, Communication and GIS technologies - Lessons learnt from countries which already developed NSDIs - Spatial data database is centrally stored and managed by Ministry of Natural Resources and Environment - Spatial data are frequently collected and updated - Supports from International organizations via projects and funds | <ul style="list-style-type: none"> - Unique strategies and policies for SDI development do not exist. And there limited coordination for overall SDI policies. - No strategies for NSDI - Lack of legislation for SDI - Weak information and communication infrastructures throughout nation - Technical standards are still under construction - Limited awareness of all stakeholders on NSDI development - Lack of human resources for NSDI - Limited investment on NSDI - Lack of strategic educational programme for SDI |
| Opportunities | Threats |
| <ul style="list-style-type: none"> - Increasing supports and funds from international organisations - Globalization that promote spatial data interoperability - State awareness of spatial data rises, and the Government starts allocating budget for NSDI - The Government is pushing administrative reforms to | <ul style="list-style-type: none"> - To some extent, spatial data are subject to social stability and security that are not fully available to all user access. - Limited fund for the implementation of SDI at the same time at all provinces and fund disbursement are interrupted - Mechanism for data sharing |

| | |
|---|--|
| facilitate spatially related services and improve transparency in public sectors - Innovations of Information, communication and GIS technology - Existing Geo-portals are centrally managed by the Ministry of Natural resources and Environment - Young human resources that have abilities to keep up with Information, Communication and GIS technologies. | - Limited budget for database updating - Policy regulating the access and sharing of spatial data - Lack of commitments between stakeholders |
|---|--|

After the SWOT matrix is constructed, components are compared in pair to underline the most suitable approach for a sustainable development of a NSDI. The analysis, usually associated with the externally-focused components (Opportunities, Threats) helps to shape options that SDI developer could pursue. By matching internal strengths and weaknesses, we can identify strategic alternatives that address the following additional questions:

- Strengths and Opportunities (SO) – How can VNSDI builder use strengths to take advantage of the opportunities?
- Weaknesses and Opportunities (WO) – How can VNSDI builder use opportunities to overcome the weaknesses you are experiencing?

A successful development of a SDI requires a good coordination to address two major technical and non-technical factors. Of all four components in the matrix, Threats can be minimized as SDI is a national infrastructure to facilitate other spatial built-on services and the drawbacks or limitations should be described as the weaknesses of the implementers rather than from external environments. By matching internal strengths, weaknesses to external opportunities, we can identify strategic alternatives that address the bottlenecks to properly align external and internal factors.

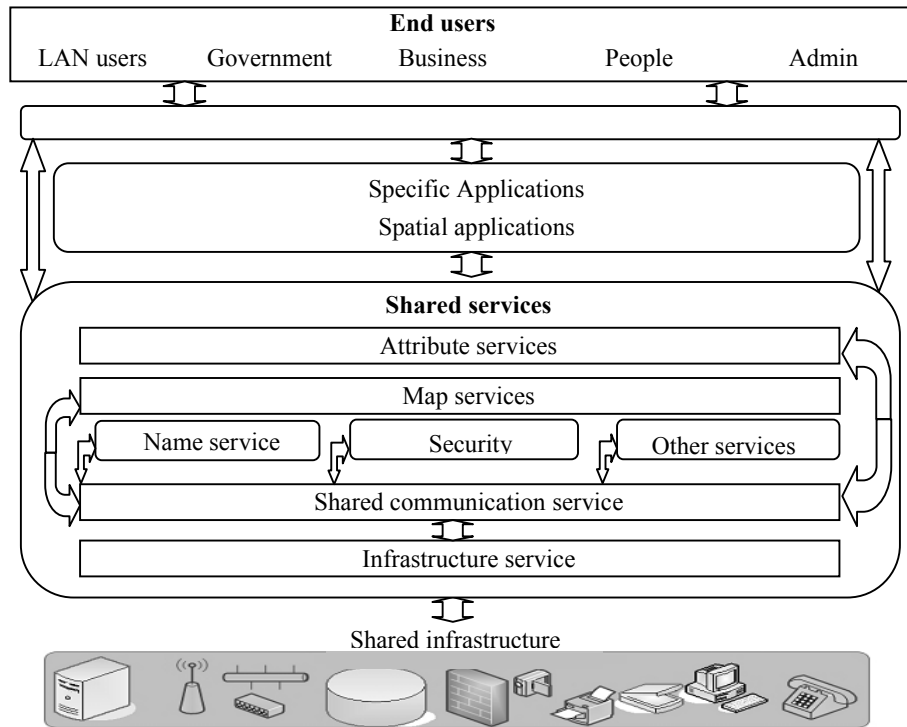


Figure 4: NSDI Application structure

3.2 Technical prototype of NDSI

Currently, an official technical guidelines for the development of NSDI has not been developed, and the alignment of Information communication technology (ICT) in the land administration systems is therefore a major challenge (Thanh B.Q 2012). At first glance Vietnam has a relatively complex institutional system of land administration, in which different levels of government and multiple institutional stakeholders need to interact. There exists a historical legacy of different type land administration systems, which in addition gradually adapted to new societal challenges

such as rapid industrialization, informatization and urbanization. Partly as a result of this situation land information products and services are the responsibility of various public agencies and government authorities in an interrelated system at national, provincial, district and commune level. Moreover, in some instances these institutional actors are part of the environmental administration, at other instances part of the physical infrastructure and construction administration. This implies, for example, that land use rights for individual citizens are processed at a different level and by different administrative columns than land use rights for companies for example. Information requirements reflect these differences as well. An efficient technical framework must address the data flow from national to local level and versus. Figure 3 shows a proposed NSDI technical structure that embarks an integrated platform for data sharing and management that supports the operation of E-Government, connection between state agencies and end users and connection to regional or global SDI.

4. CONCLUSIONS

From the reflective analysis of the weaknesses and opportunities, we assessed that SDI is still underway of construction, notwithstanding the thorough understandings of a SDI and approaches are not in sync among agencies. The success of SDI implementation is based on the government vision, commitments of state organizations and current implementation of spatially related policies. The findings pointed to the need to establish a national steering committee to revise current laws and regulations and coordinate inter-agency activities, technically and socially. We acknowledge that the implementation of a SDI is a mutually influencing and historically grown process and should adapt to the international standards. The development must evolve from several land administration projects and take advantages of the current spatial databases.

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