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Ghana's Right To Information Bill: Opportunity For SDI As A Technical Infrastructure *

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Abstract

Information is an important resource in the 21st century knowledge-based society. Access to public sector information is being viewed as an important path to strengthening democracy, good governance, public service and sustainable development. Ghana is about to enact a right to information law (now *The Right to Information Bill*) to provide a legal framework for making public sector information accessible to the public. However, while the legal framework is necessary, it is not sufficient to ensure real access to public sector information by the public. This paper highlights the need for designing policy and institutional frameworks in general and a technical infrastructure in particular for actuating the provisions of the anticipated law. With specific focus on access to public sector spatial information, the paper assesses the conditions, opportunities and imperatives for building SDI, at least, as part of the technical infrastructure for making public sector information discoverable, retrievable and usable to the public. The paper argues that the passage of the Right to Information Bill into law carries with significant opportunity for the development of SDI. Steps are then proposed for creating the SDI in a three phase approach: initiation, evolution and building, and integration, institutionalization and scaling up. The significance of the paper lies in its pioneering contribution to the emergent discourse on the design of policy, institutional framework and technical infrastructure for making PSI (especially public sector spatial information) easily accessible to the Ghanaian public in anticipation of the right to information law.

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1. INTRODUCTION

The 21st century knowledge-based society essentially thrives on information. Economists and policy scientists have recently begun to recognize the huge potential of public sector information (PSI) as an enabler of socio-economic development (Eckardt, 2008). The discourse that has emanated from the recognition of the far-reaching effects of information policy on socio-economic development is both stimulating and interesting, growing organically to encompass an epistemic community of experts. PSI is a valuable national resource and the economic benefits accruable to the state from such information are maximized by increasing the distribution and use of the information through inexpensive mechanisms (Eckardt, 2008; Talero, 1997; OECD, 2001; Rhind, 1991). More so, both governments and citizens in countries that practice representative democracy have been actively searching for better avenues for engagements. The need to keep citizens well informed and to enhance their democratic participation in the formulation of public policy and governance keep growing in scope and complexity. Access to PSI improves the democratic participation of citizens in the formulation of policy, which in turn improves governance and makes government transparent and accountable. It also contributes to building public trust in government, improves the quality of public policy and strengthens democracy and civic capacity (OECD, 2001). Improved access to PSI also creates information industry and market which improve business, create new enterprises and contribute substantially to socio-economic development. It is within this context that President Barack Obama of the United States, within a day into his administration, presented a memorandum entitled *Transparency and Open Government* to the heads of executive departments and agencies. The memorandum states:

My Administration is committed to creating an unprecedented level of openness in Government. We will work together to ensure the public trust and establish a system of transparency, public participation, and collaboration. Openness will strengthen our democracy and promote efficiency and effectiveness in Government (President Obama, 2009).

Legal, policy and institutional frameworks are required to make public sector information accessible to citizens. Different nations, particularly in the developed world, have adopted various shades of legal, policy and institutional frameworks to ease access to PSI. Basically, these frameworks set out the conditions and rules for accessing and exploiting PSI, define the extent of public participation in

governance and policy formulation and gives direction to the building of the technical infrastructure required for managing the integrity and demands of information from citizens. The legal framework is fundamental in that it provides the boundaries within which policy and institutional frameworks are designed. The legal framework takes the form of *freedom of information* or *right to information* law. In 1980, only 20 per cent of the OECD Member countries had legislation on access to information; in 1990 this figure had risen to just over 40 per cent and by the end of 2000 it had reached 80 per cent (or 24 out of the 30 member countries); and the scope, quantity and quality of PSI provided to the public has also increased significantly (OECD, 2001). This contrasts sharply with the situation prevailing in Africa where governments are now beginning to realize the utility of PSI in democratic governance, policy formulation and sustainable development.

In Ghana, substantial pressure from civil society (a kind of bottom-up initiative) has compelled government to take steps towards creating a legal framework that allows access to PSI by citizens. As a consequence of intensive engagements between civil society and government, the Right to Information Bill (hereinafter referred to as the Bill) was drafted in 2007 and Cabinet finally endorsed the Bill in 2009, after a number of modifications, for onward submission to Parliament. This paper is based on the state of the Bill endorsed by Cabinet. It was expected that the Bill would pass by the end of 2010 and civil society organizations have kept up the pressure. The Bill has had its first reading in parliament but has not yet passed due to calls for further modifications. Some of the interesting modifications proposed by the coalition of civil society organizations on the Bill are:

- Changing the title to *Freedom of Information Bill*; since freedom is greater than a right which may be taken by government at any time.
- Enhancing accountability by specifying penalties for information officers and/or officials who, without just cause, delay a request for information or refuse application on unwarranted grounds; and that a reasonable time limit should be specified for response to requests for information.
- Fees should be limited to the document search, duplication, and review by the information officer (i.e. marginal cost approach) and must provide for waiver of fees in certain circumstances.
- The establishment of a central executive agency designated to oversee the implementation and functioning of the law and ministers should have no business in the review of applications and compilation of list of publicly accessible information.

- Positive obligation for setting up, upgrading and/or scaling up specific systems for storing and disseminating information, taking into consideration both traditional and modern means and tools of communication. To this end, there should be a clear provision on funding the implementation of the law; and priority for funding the development of information systems in particularly public institutions affected by the law.
- Tight and clear provisions that bear positive obligation for *suo motto* disclosures by Government (i.e. government proactively informing citizens without being asked) in order to give substance and effect to the constitutional provision of right to information.
- Further relaxation and clarification in the restrictions and exemptions clauses as these are too wide and vague in their current form.
- The extension of the coverage of the Bill to all agencies and entities of public interest or in which Ghana has an interest.

The rest of the proposed modifications are arguments largely on points of legal technicalities which are beyond the scope of this paper. Parliament is still engaging stakeholders to fine-tune the Bill before passing it into law. However, there are strong signals, according to the coalition of civil society organizations for the Bill, that the Bill is likely to be passed into law before the end of 2010. The Right to Information Law, if enacted, will make Ghana join the ranks of the very few African states to have passed such a law; and the first West African nation to have done so.

However, while the legal framework is necessary, it is not sufficient for ensuring that citizens actually are able to exercise this right to effectively access and use (certain types of) PSI. For instance, spatial information forms a substantial component of PSI since a greater proportion of the decisions regarding resource management and the provision of public services are spatial in nature (Giff *et al*, 2008). Spatial Data Infrastructure (SDI) has been an integral part of the technical infrastructure used for particularly spatial information discovery and distribution in many nations that have enacted freedom of information laws (Yawson *et al*, 2009; Williamson *et al*, 2003; Masser, 1998; Rhind, 1999). This is because a greater chunk of spatial data is digital, or is currently of higher utility in a digital format. Therefore, a logical sequel to the enactment of the law is to create the appropriate policy and institutional frameworks and to build the technical infrastructure required to give life to the law. The technical infrastructure is critical in that it serves as the physical vehicle that makes the information accessible. *Accessibility* in this context comprises discoverability, retrievability, affordability and usability of information to a prospective user.

In the light of the provisions of the Bill, this paper offers an appraisal of the conditions and potential for implementing SDI, at least, as part of the technical infrastructure for actuating the promise of the Bill, when it becomes a law, with particular regard to making public sector spatial information accessible. The paper also offers suggestions of steps towards SDI implementation as elements for consideration in the design of policy and institutional frameworks as a consequence of the law. The paper contributes to the emergent discourse on making PSI (especially public sector spatial information) easily accessible to citizens in anticipation of the right to information law.

2. AN OVERVIEW OF THE RIGHT TO INFORMATION BILL

Chapter 5 of the 1992 Constitution of Ghana is devoted to the fundamental human rights which shall be upheld by all arms of government and all citizens as inviolable and inalienable. Under the same chapter, *Article 21, clause 1, paragraph f* provides that all persons shall have the right to “information subject to such qualifications and laws as are necessary in a democratic society”. The purpose of the Right to Information Bill is to give substance to that constitutional provision by providing for:

- (a) access to official information held by government agencies, and
- (b) the qualifications and conditions under which the access should be obtained.

Broadly, the Bill addresses two issues: (a) access to information held by government agencies and (b) general and miscellaneous matters. The Bill provides that, with the exception of information exempted from public access, a person has a right of access to information or part of an information in the custody or under the control of a government agency; and that a person need not specify the reason for the request except that the applicant requires an urgent response to the request. The Bill also guarantees maximum disclosure and enjoins government to actively provide information on governance to the public without the need for application from a citizen. The Bill enjoins every Minister, in consultation with the Public Services Commission and the Head of Civil Service, to compile and publish an up-to-date manual on official information in custody of agencies under his/her ministry. In addition, the manual should specify which information is accessible freely, at a fee, or may be purchased; and provide the contact details of the person to whom an application may be made and the procedures by which the information can be accessed.

Clauses 5 to 18 deal with matters related to exempt information; and specifies a tall list of information that may be exempted from public access and the reasons for the exemptions. These generally include information from the office of the president and/or vice-president; information relating to cabinet decisions, law

enforcement, public safety and national security, defence, international relations, and other privacy issues. Clauses 19 to 30 deal with the conditions and procedures for access to information. Interestingly, the Bill empowers agencies to charge application fees and, where necessary, charge extra fees if the agency feels the cost of making the information available exceeds the application fee. In the same breath, agencies have to appoint information officers to handle applications for information. The information officer is empowered by the Bill to determine whether an application should receive a positive response or be refused or the processing period be extended; and the manner in which this should be handled. The information officer of an agency is empowered to reject an application for access to information where:

(a) the application is frivolous or vexatious, or

(b) the processing of the application would require an unreasonable diversion of the agency's resources and the applicant has not paid in advance the cost of the processing as determined by the agency.

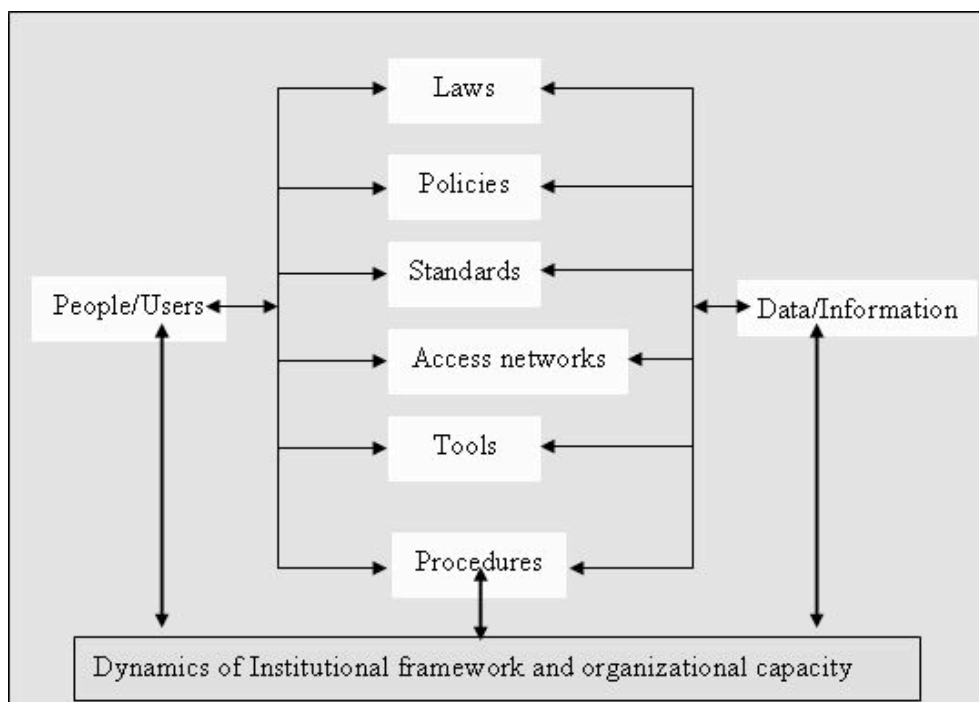
The rest of the Bill deals with privacy issues, enforcement or implementation of the act, interpretation and other miscellaneous matters. Since the Bill is also aimed at mitigating corruption, *clause 64* empowers the Attorney-General to extend the application of the law to the private sector.

3. CONCEPT OF SPATIAL DATA INFRASTRUCTURE (SDI)

SDI provides a framework for sharing spatial data or information. It consists of an ICT technical infrastructure for sharing spatial data or information within, between or among organizations based on specified legal, policy, and institutional frameworks and standards (Yawson *et al*, 2009). Thus, SDI embodies the essential requirements for giving life to the Bill. It enables the organization and integration of data or information across disciplines and organizations. Various definitions of SDI have been given by different authors (e.g. Tuchyna, 2006; Strain *et al*. 2006; Scholten *et al*. 2006; Masser, 2000; Groot and McLaughlin, 2000; Chan and Williamson, 1999; Rajabifard *et al*, 1999, 2002; Williamson, 2000). Nebert (2004) explains SDI to mean the relevant base collection of technologies, standards, laws, policies, and institutional arrangements that facilitate the availability of, and access to spatial data. Thus, SDI provides a basis for spatial data discovery, evaluation, and application for users and providers within all levels of government, business and industry, the non-profit sector, academia and even by citizens in general. SDI is based on a networked infrastructure that allows the integration of heterogeneous datasets from various sources based on a particular web ontology which makes access to data possible either directly or indirectly (Lacasta *et al*, 2007). SDI has the potential to expand the utility of geo-information, and to foster and enhance cross-jurisdictional, trans-

disciplinary, multi-stakeholder, and multi-criteria decision-making (Groot, 1997). SDI provides the platform that supports both active and passive provision of information by governments. It also has the capacity to integrate online analytical or web mapping services that are becoming increasingly beneficial to citizens. SDI has a huge potential to ensure standardization, harmonization and integration of information across agencies and reduce doubling of efforts and cost in data collection, processing, management and access (Groot, 1997; Williamson *et al*, 2003; Crompvoets *et al*, 2008). This is important as, conventionally, government agencies often conduct their management activities in an environment where authority is split up, information and actions overlap, and it is objectively impossible for the many actors involved to reach consensus on the proper measures to take, resulting in a chain of inactions and dysfunctions (Ting and Williamson, 2000). Figure 1 shows the general structure and components of SDI.

Figure 1: Structure and Components of SDI



3.1. SDI in Ghana: Past and Present

Ghana came close to establishing a functional SDI in the early 90s. This was called the National Framework for Geospatial Information Management

(NAFGIM). In the late 80s to early 90s, African Governments implemented a continent-wide National Environmental Action Plans (NEAPs) aimed at addressing the imbalance between economic growth and environmental sustainability. To this end, Environmental Information Systems in Sub-Saharan Africa (EIS-SSA) were to be developed to provide timely and readily accessible information not only to support the implementation of the plans, but also to assist resource planners in their work. An overview of this continent-wide project is provided by Ezigbalike (2004). As part of the NEAP (and for that matter EIS) implementation efforts in Ghana, the Natural Resources Management Project (NRMP) was implemented; and the environmental resources management component was GERMP (Ghana Environmental Resources Management Project). Soon after the initiation of the NRMP, it became obvious that availability and access to the requisite spatial data posed a great threat to the project. Consequently, five institutions (Survey Department, Lands Commission, Soil Research Institute, Meteorological Services Department, and the Remote Sensing Applications Unit of the University of Ghana) were brought together to produce and collate the relevant land-related datasets for the project. This was funded by the Ghana Government, World Bank and DANIDA. However, a framework for sharing data and/or information among the participating institutions in the project was visibly absent in the Plan. A quote from the Country Paper (EPA, 2005) will vouch for this claim: *“it was perhaps taken for granted that information and data generated by and/or needed for effective functioning of the relevant agencies would be accessible or available to one another. Information and data that originated from the agencies remained in their respective custodies, often in original state and may be guarded rather jealously. The absence of a clear-cut policy and financial commitment to facilitate environmental information and data harmonization, access, sharing, etc. among resource management agencies and other users was an unfortunate oversight in the NEAP initiative.”*

The data producing institutions felt the need for and initiated the creation of a framework for sharing data. This initiative led to the birth of the National Framework for Geospatial Information Management (NAFGIM). NAFGIM presented an unprecedented opportunity for SDI in Ghana, and it grew rapidly to include over thirty institutions within a short time. Important datasets like land cover/land use maps, soil and land suitability maps, meteorological map (rainfall), and topographic map of Ghana were produced. Unfortunately, the termination of GERMP in 1998 marked the beginning of attrition of interest in NAFGIM. Investigations at EPA show that NAFGIM is no longer functional (Karikari, 2006).

The evolution of NAFGIM was conceived to have two phases: the establishment phase and the development phase. The establishment phase consisted of creating awareness and shared interest, identifying datasets fundamental to the NRMP/GERMP and NAFGIM and mapping synergistic strategies to fill data gaps.

It also included the identification of policy, legal, institutional and standards requirements to make NAFGIM successful. With the exception of policy and legal frameworks, the tasks of this phase were essentially achieved and was aimed at building consensus and creating a forum for particularly data producers. This establishment phase ended with the creation of a website (www.nafgimghana.org) to create a communication platform for stakeholders and to host metadata information pending the creation of a clearinghouse. The Environmental Protection Agency (EPA) was chosen to host NAFGIM and the clearinghouse; and an organogram was designed and a framework for data sharing was also established. The development phase included largely the creation of a clearinghouse for the data and the growing of the SDI in scale, content, use and participants. Technical training was provided for this phase by experts from the United Nations Environment Program (UNEP). However, this phase coincided with the completion of the NRMP/GERMP and therefore was not completed. This means NAFGIM was established but was not developed. It should be pointed out that the development of NAFGIM was not originally part of the project. It rather developed as a matter of necessity and shared interest. The collapse of NAFGIM is a greatly missed opportunity for Ghana; and currently Ghana has no SDI in operation at any administrative scale.

3.2. Organizational Capacity for SDI in Ghana

The legacies of the NRMP and NAFGIM constitute a strong capacity base for SDI in Ghana. During the implementation of NAFGIM, spatial data and metadata standards were identified and broadly agreed upon by the participating institutions. Standards are part of the core components of any SDI. With these standards, metadata catalogue and a clearinghouse were to be implemented in the development phase. EPA still has relevant information regarding the NAFGIM implementation and this can serve as a guide in implementing SDI. More so, the capacity of the participating institutions on data and metadata standards was strengthened and those institutions were preparing to make their data holdings available for sharing within the framework of NAFGIM. The personnel that received training are still available in their respective institutions. Awareness is also fundamental to the successful implementation of SDI. Awareness is the precursor of shared interest and consensus-building (Thellufsen et al, 2009). NAFGIM created awareness, consensus and shared interest in SDI. Any attempt to re-initiate SDI can take advantage of this legacy of NAFGIM.

The implementation of the Land Administration Project has also increased significantly the capacity of the land sector agencies which were at the forefront of NAFGIM. This includes retraining of personnel for data capture and management, technical supplies (tools and equipment including computers) as well as orientation towards SDI (as LAP is expected to provide a foundation for SDI). Finally, public sector agencies have been asked by government to generate

revenue to complement public funding. As a result, a number of public institutions have started selling data to the public, a situation that has increased interest in data capture, processing and management in a manner that is responsive to consumer requirements. This situation also creates a positive imperative for SDI. Access networks have also improved. Particularly, computer density and access to broadband internet connection, as well as the capacity to incorporate ICT in business and/or institutional procedures, have improved significantly. The use of ICT and broadband internet is expected to improve further in the public sector when the ECOWAS wide area network becomes operational. These, in total, signify the availability of minimal capacity requirement for SDI. What is lacking at the moment are legal and policy frameworks (which will be addressed, hopefully, by the Right to Information Law and consequent policies).

One significant requirement for successful SDI is the capacity of organizations to produce and/or consume spatial data. According to the country paper on environmental statistics (EPA, 2005), there are a number of organizations in Ghana that have the capacity to produce quality spatial data and there is existing organizational capacity and market for spatial data consumption. The NAFGIM implementation report (EPA, 2001) showed that at the time NAFGIM was folding up, about 25 organizations had the capacity to produce spatial data and these same organizations held significant datasets in their custody. For spatial data consumption, the greatest demand has been from government, private corporate bodies and institutions of higher education and research. The Right to Information Law is likely to increase the consumption of spatial data provided appropriate policies are adopted consequent to the passage of the Bill. Thus, there is capacity for data production and consumption; and the EPA still has the capacity to coordinate the implementation of SDI as a sequel to the enactment of the Right to Information Law. More importantly, even though NAFGIM was only accessory to GERMP, it has created an epistemic community of stakeholders that can serve as a fulcrum for restarting SDI. Thus, the case of NAFGIM demonstrates institutional willingness and capacity to cooperate in actuating SDI if the appropriate legal, policy and institutional frameworks are provided; and points to a core stakeholders that can re-initiate SDI. Thus, there is a base organizational capacity on which SDI can evolve and develop to facilitate access to public sector spatial information, taking advantage of the enactment of the Right to Information Law.

4. THE RIGHT TO INFORMATION LAW AS A DRIVER OF SDI

The Bill has implications for access to both spatial and non-spatial data held by public sector bodies. The Right to Information Law (RIL) will most certainly increase demand for public sector spatial information. The RIL can influence SDI development either directly or indirectly. In the direct sense, public sector bodies can take the initiative to develop internal information infrastructure amenable to

serving spatial information to clients. This evolution of information systems at the institutional level can grow independently or with some direction from a coordinating body to become a networked infrastructure for SDI. In this case, standards and laws evolve with time as convergence is approached. Indirectly, the RIL is likely to bring to the fore the need for a national geospatial information policy to guide the development of infrastructure, technical tools and financing for the production, dissemination and responsible use of spatial information (Kufoniyi, 2004), as well as the interaction among institutions and human actors. The primacy of such a policy for sustainable production and use of spatial information, development of SDI and ultimately for sustainable development has been emphasized in UNECA (2000). Through its Committee on Development Information (CODI) and the Geo-Information Sub-committee (CODI-Geo), the United Nations Economic Commission for Africa (UNECA) is focusing substantial effort on geospatial information policy and SDI development in Africa. An Executive Working Group (EWG) has been established to this effect under the Development Information Services Division. The EWG functions like the Permanent Committees of other regions. Through this structure, UNECA searches for opportunities to propel the development of geospatial information policies which will provide the fundamental forward thrust for SDI development. The passage of the RIL will constitute a significant opportunity for UNECA and other bodies with similar interest, both locally and internationally, to push for geospatial information policy development and, consequently, SDI in Ghana. Thus, the RIL will function as a driver for the development of SDI mainly through its indirect influence on the development of geospatial information policy. Therefore, the passage of the RIL will provide a backdrop for the principles and goals of geospatial information policy as indicated by UNECA (2000) and Kufoniyi (2004) and their relationship with SDI components as summarized in table 1.

Table 1: Relationships between geospatial information policy components and SDI components

Policy level element	Policy Principles	Policy Objectives	SDI Components
Geo-information as a resource	<ul style="list-style-type: none"> -geo-information is part of national resources, -has socioeconomic value like other natural resources, -has relevance for security 	<ul style="list-style-type: none"> -create a national vision for spatial information infrastructure -articulate the utility of spatial information as a resource in development -generate political support 	<ul style="list-style-type: none"> -technical tools for data capture, processing and management -financing -political support and institutional

	<p>requires infrastructure (as part of the national infrastructure) for its management</p> <p>-requires the level of political and financial support accorded to other resources and infrastructural development</p>	<p>and security</p> <p>-ensure adequate financing</p>	<p>engineering</p>
<p>Institutional coordination of multiple actors at multiple spatial and temporal scales</p>	<p>-network of producers and users (public, private and other organizations)</p> <p>-multiplicity of actors and human agency</p> <p>-minimization of conflict and tensions, and harmonization of interests, values and expectations of actors</p> <p>-shared ownership and distribution of inventory risks</p> <p>-standardization</p>	<p>-facilitate sustainable investment in coordinated production, access and responsible use of spatial information</p> <p>-minimization of doubling of efforts and wastage of scarce resources</p> <p>-provide legal framework and guidance for institutional engineering</p> <p>-facilitate the use of multi-stakeholder processes</p>	<p>-standards, laws, procedures, socio-cultural factors and institutional frameworks</p> <p>-requirement of networked systems</p> <p>-people (producers and users)</p> <p>-datasets: types, quality and security</p>
<p>Citizens rightful claim on public sector spatial information</p>	<p>-public sector data producers are custodians and not owners</p> <p>-citizens pay for collection and maintenance of data</p> <p>-delivery of spatial information as part of public/social service</p>	<p>provide framework for:</p> <ul style="list-style-type: none"> - access and restrictions to access - awareness creation -data security, quality and privacy - responsible use - responsibility of data custodians 	<p>-access networks</p> <p>-information pricing issues</p> <p>-legal issues on right of access and restrictions</p>

<p>Linkage with other sectors and overall benefits</p>	<ul style="list-style-type: none"> -generation of socio-economic benefits -leveraging multi-level linkages and partnerships -enhancement of national image with regard to commitment to international treaties and conventions. 	<ul style="list-style-type: none"> -enhance support to business, citizens' welfare, public services and others -facilitate the creation of mechanisms for monitoring of use, assessment and evaluation of benefits of spatial information - promote research, education and capacity building 	<ul style="list-style-type: none"> -development of services and applications for wide use of spatial information and related services -continuous improvement in capacity to produce, manage and use spatial information, as well as develop and deliver applications and services.
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Indeed, in many countries, freedom of information or right to information law has facilitated the development of SDI. According to Longhorn (2002), it is not surprising that many of the strongest and most successful SDI initiatives today have developed in countries with strong freedom of information cultures, such as USA, Australia and New Zealand, Finland, and many others. He argues further that if one accepts the often quoted figures as to what percentage of spatial data is in the public domain, regardless of the accuracy, then any society that offers and encourages free access to public sector information should automatically be well placed to develop its spatial information industries, both public and private, as well. What is important is the articulation and recognition of the utility of spatial information for socio-economic development, governance and quality of citizens' lives. In line with this, the Australian Spatial Data Infrastructure (ASDI) was developed in the context of a legal framework that encouraged wide access to public sector information (AUSLIG, 1998; Longhorn, 2002). Therefore, the passage of the RIL can provide a seminal drive for the development of SDI in Ghana; and it is within this context that SDI finds space as a technical infrastructure for actuating the Right to Information Law. Following the first reading of the bill in parliament, some key stakeholders in NAFGIM have started discussions on reviving SDI taking advantage of the anticipated right to information law. The discussions revolve around issues regarding the initiation, development and scaling up, as well as issues related to standards, funding, institutional/organizational matters, and stakeholder participation.

4.1. Towards SDI: Proposed Steps

Implementation of SDI is essentially a multi-stakeholder process, where stakeholders refer to the diversity in institutions and their human actors and agency. This brings into sharp focus the dialectic of evolution and construction of information infrastructure as expressed by Nielsen (2006). Based on this dialectic of evolution and construction concept, we suggest a three phase approach to building SDI in Ghana, in the context of the RIL, to serve the spatial information needs of citizens. The propositions hold some relevance for situations in which geospatial information policy becomes existent or non-existent. However, these propositions are made bearing in mind the non-existence of geospatial information policy in Ghana, with the hope that the SDI initiative can help with the build-up of pressure for the appropriate geospatial information policy. These steps are only suggestive and not definitive. Thus, the actual process will be heuristic and participants in the SDI development should prepare for shocks, unintended results and modifications of methods and strategies throughout the process.

a. Initiation (Phase I): The discussion already initiated by some members in NAFGIM is laudable and should be continued as the starting point for re-starting SDI. This is the phase for recreating a shared interest and vision, a framework for cooperation, a plan of action, and, more importantly, articulating a strong relationship between the anticipated law and SDI, as well as the identification of opportunities and constraints. It is important that this phase is limited to a few key NAFGIM members (called initiators) in order to make the process manageable, avoid chaos and attrition of interest. Institutions suggested include the Environmental Protection Agency (EPA), Lands Commission (Survey Department, Land Title Registry, and Town and Country Planning), Centre for Remote Sensing and Geographical Information Systems (CERSGIS), Soil Research Institute, Ministry of Roads and Transport and its key departments (Highways, Urban and Feeder roads), Ministry of Finance and Economic Planning, Ministry of Environment, Science and Technology, Ministry of Lands and Forestry, Ministry of Information, and Ministry of Communications. The ministries are necessary for reasons of financing and political support; and it is important to identify GIS champions in these ministries. One of the key activities at this phase is the appraisal of NAFGIM and taking inventory of the remnants of NAFGIM to ascertain which structures, materials, tools and opportunities still exist and are usable with or without modifications. Also, an appraisal of the existing internal capacities of the initiating organizations is necessary to have an overview of existing data-holdings, the human, technical and financial capacity as well as the gaps and the implications of these for the intended SDI. The core group should engage in open discussions about the structure and components, the trajectory of the evolution and development and the envisaged future of the SDI; establish and commit themselves to some ground-rules regarding, for

example, roles and responsibilities, performance indicators and expectations. It is recommended that EPA is appointed to coordinate the evolutionary process due to its experience with NAFGIM. In addition to the existing spatial and other relevant non-spatial datasets in the custody of the core group, relevant datasets in other global and local databases should be surveyed. However, it is important that this is restricted to foundation and framework data as the matrix of the SDI (Mapping Sciences Committee, 1995; Groot, 1997), such as geodetic points, administrative boundaries, major soils, roads, geology, land cover/land use, hydrographic data, climatic data and topography. The participating institutions should agree to publish online (in their respective websites) a list of spatial and related non-spatial datasets accessible to the public and the procedure for access as contained in the information manual required by the Right to Information Law. EPA can then create links on its website pointing to the list of datasets in the other institutions, as well as links to other global databases such as the United Nations Environment Program (UNEP), Global Biodiversity Information Facility (GBIF), the International Union for Nature Conservation (IUCN), and the United States Geological Survey (USGS). Finally, metadata preparation for datasets in the participating institutions should commence at this stage and the related ministries should be convinced to have the SDI in mind when designing policies and financing plans in response to the Right to Information Law. The core group should devise a strategy and engage in advocacy for an appropriate spatial information policy to enhance the evolution and development of SDI.

b. Building and Evolution (Phase II): At this stage, the core group should have an overview of the information infrastructure and processes required to serve the Right to Information Law. The core institutions should then commence building their own information systems bearing in mind the requirements of the SDI such as interoperability. The building process consists of bringing together technical and social components with the view to modifying and/or reshaping existing structures, systems and procedures in the institutional context. Thus, internal information systems and processes in the respective institutions are upgraded by modifying and/or installing new components or applications that are compatible with spatial data services and filling data gaps. Cheaper but robust tools (such as open-source software) should be preferred for their flexibility and high utility. Standards regarding data formats and quality should also be incorporated into this process; and the institutions begin restructuring their datasets appropriately and improving the related metadata. The information systems can then be consummated by developing the content (e.g. uploading data, building and testing applications) and providing services. The core group should have scheduled meetings to check the progress towards SDI by peer-reviewing their respective activities, providing guidance and support and modifying plans and strategies if necessary. A national survey of data producers and users, as well as data requests and use patterns should be undertaken at this stage. The

coordinating organization should begin discussions with other potential participants with the view to roping them in; and issues bordering on the protection of the rights, data and other intellectual properties of especially data providers should be clarified. Intra- and inter-institutional sharing of knowledge, skills, experience and tools could keep alive the interest of the participants. Both the tangible and intangible benefits of the spatial information services should be monitored and documented to form the basis for a business case for up-scaling. It is also important to align and harmonize this process with the anticipated land-sector information system from the Land Administration Project (LAP), which is expected to serve as the cornerstone for a national SDI. Thus, this phase is about building the spatial databases and related applications and services in the respective institutions to serve as the installed base that will provide a momentum for the SDI (Hanseth, 2000); an approach essential to minimizing inter-institutional conflicts over autonomy and control.

c. Integration, Institutionalization and Scaling up (Phase III): at this stage, preparations are made to connect the information systems in the respective institutions, in a federated manner, to a central server that serves as a clearing house. A user interface is developed to ease data identification and access, showing a well structured metadata and access protocols. A request from the central server is communicated to the relevant institutional server and a response is generated to the user via the central server. Other datasets from global databases can also be extracted and made available. More applications and services can be developed on the central server to transform it into a National Spatial Data Service Center. At this stage, a mandated management committee (comprising representatives from all the institutions) is formed and tasked with ensuring the continued running of the SDI, continued generation of benefits to stakeholders and attraction of more participants to the SDI. The committee continues to develop the SDI and promote the development of novel applications and services to expand the scope and functionality of the SDI. Ultimately, this committee should bring onboard other competent staff to ensure the successful delivery of its responsibilities; and appropriate organizational structure, rules and regulations can be developed to steer the SDI. Awareness creation is critical to the success of this phase, especially to bring onboard other participants and stakeholders. Awareness can be created through lectures and fora, conferences, seminars, workshops, publications, and development of appropriate projects aimed at increasing the data contents, updating and improving the quality of the datasets, developing and documenting standards. The awareness campaign should aim at demonstrating the performance and discussing the status of the SDI; and to show how prospective institutions can participate in and generate benefits from the SDI. The current and potential applications of the SDI should be highlighted and best practices articulated.

5. CONCLUSIONS AND RECOMMENDATIONS

Ghana is in the process of becoming the first West African nation to pass a right to information law which provides the legal framework for accessing and using PSI. This paper has offered a preliminary appraisal of the potential conditions for implementing SDI as part of the technical infrastructure to give life to the law. In the context of the provisions of the Right to Information Bill, this paper has argued that the legal framework is a necessary condition but not sufficient in itself to guarantee actual access to information. Based on the review of the organizational capacity for SDI, the paper argues that the Bill presents a considerable opportunity for SDI and carries with it consequential imperatives for considering SDI as part of the technical infrastructure for delivering especially spatial information to the public; and that certain provisions in the Bill, or their implications thereof, can better be delivered using ICT tools and SDI as the vehicle to minimize the transaction cost and frustration related to the discovery, evaluation, retrieval and use of data/information (with particular emphasis on spatial data). This will also minimize bureaucratic bottlenecks and corrupt tendencies that bedevil totally manual, offline systems. It is shown that the passage of the Right to Information Law can influence the development of SDI either directly (through independent institutional initiatives) or indirectly (through the development of geospatial information policy).

The paper then proposed steps, comprising broadly of three phases, for consideration in an attempt to actualize SDI, taking advantage of the anticipated law. The first phase is the initiation and consensus building phase limited to a few key institutions that prepare the framework of cooperation and action plan for the SDI, and appoint a coordinating organization. The second phase is devoted to building and evolution of the SDI, consisting of building internal information systems and processes amenable to delivering spatial data and related services in the respective institutions. The last phase is devoted to federating the respective information systems of the participating institutions to a central server which grows in scope and functionality to become a national spatial data hub, the formation of a mandated management committee and scaling up of the SDI by bringing onboard other participants, users, applications and services. The federated approach is favoured to minimize inter-institutional conflicts which can result in attrition in interest. It is also important to reduce the cost of implementing a functional SDI that integrates multi-scale and multi-source data/information. The institutionalization is essential for the sustainability of the SDI.

However, these propositions are not exhaustive and definitive; they are suggestive and meant to set the tone for a scholarly discourse on developing the requisite technical infrastructure for actuating the promise of the Bill. They, nonetheless, have value as inputs in the design of information policy and institutional frameworks aimed at actuating a technical infrastructure to serve the

objects of the anticipated law. It is important that further work is done to examine the contexts and requirements of policy and institutional frameworks for the anticipated law and the possibilities of integrating ICT tools and information infrastructure that enhance access to spatial information and related services.

REFERENCES

- AUSLIG (1998). Commonwealth Position Paper on the Australian Spatial Data Infrastructure (ASDI).
- Chan, T.O. and I.P. Williamson (1999). "Spatial Data Infrastructure Management: Lessons from Corporate GIS Development", *Presented at the AURISA Annual Conference, November 1999, Blue Mountains, Australia*.
- Crompvoets, J., A. Rajabifard, B. van Loenen and T.D. Fernandes (Eds.) (2008). *A Multi-View Framework to Assess Spatial Data Infrastructures*, Melbourne: Melbourne University Press.
- Eckardt, S. (2008). Public Accountability, Fiscal Conditions and Local Government Performance – Cross Sectional Evidence From Indonesia, *Public Admin. Develop.*, 28: 1-17.
- EPA. (2001). "Report on NAFGIM Implementation – Establishment Phase". Environmental Protection Agency, Information Office, Accra, Ghana.
- EPA. (2005). "Environmental Statistics in Perspective: Country Paper (Ghana)", *presented at the Workshop on Environmental Statistics for the ECOWAS Region, 28th Feb. – 4th March, 2005, Dakar, Senegal*.
- Ezighalike, D. (2004). "Advances in SDI Development in Africa", GISDECO Pr. Development Information Services Division, United Nations Economic Commission for Africa, Addis Ababa, Ethiopia. www.gisdevelopment.net/proceedings/gisdeco/2004/keynote/ezi.htm (accessed on 28/2/2010).
- Giff, G., B. Van Loenen, and J. Zevenbergen (2008). PSGI Policies in Norway and England: Are They Within the Spirit of Recent EU Directives? *International Journal of Spatial Data Infrastructure Research*, 3: 118-145.
- Groot, R. (1997). Spatial Data Infrastructure for Sustainable Land Management, *ITC Journal*, 3(4): 287-294.
- Groot, R. and J. McLaughlin (Eds.) (2000). *Geospatial Data Infrastructure: Concepts, Cases and Good Practice*, London: Oxford University Press.

- Hanseth, O. (2000). "The Economics of Standards." In Ciborra, C. (ed.). *From Control to Drift: The Dynamics of Corporate Information Infrastructures*, Oxford University Press, Oxford, Pp. 56-70.
- Karikari, I. B. (2006). Ghana's Land Administration Project (LAP) and Land Information Systems (LIS) Implementation: The Issues. Article of the month, International Federation of Surveyors. www.fig.net/pub/monthly_articles/february_2006/karikari_february_2006.htm (accessed: 14/10/2009).
- Kufoniya, O. (2004). Geospatial Information Policy Development, an Essential Backbone for SDI Implementation in Africa. *7th Conference of GSDI on Geospatial Information Policy Development, February 2-6, 2004, Bangalore, India.* <http://www.gsdidocs.org/gsdiconf/GSDI-7/papers/TSIpOK.pdf> (accessed: 29/07/2010)
- Lacasta, J., J. Nogueras-Iso, R. Bejar, P.R. Muro-Medrano and F.J. Zarazaga-Soria (2007). A Web Ontology Service to Facilitate Interoperability Within a Spatial Data Infrastructure: Applicability to Discovery, *Data Knowl. Eng.*, 63: 947-971.
- Longhorn, R. A. (2002). Spatial Data Infrastructure and Access to Public Sector Information: The European Scorecard at 2002. *5th AGILE Conference on Geographic Information Science, April 25-27, 2002. Palma (Balearic Islands), Spain.* http://plone.itc.nl/agile_old/Conference/mallorca2002/proceedings/dia26/Session_9/s9_Longhorn.pdf (accessed: 29/07/2010)
- Mapping Sciences Committee (1995). A Data Foundation for the National Spatial Data Infrastructure, National Research Council, National Acad. Pr., Washington DC, USA.
- Masser, I. (1998). *Governments and Geographic Information*, London: Taylor and Francis.
- Masser, I. (2000). "What is a Spatial Data Infrastructure Management?", *Proceedings of the 4th Global Spatial Data Infrastructure Conference, March 13-15, 2000, Cape Town, South Africa,* at www.gsd.org/capetown/masser [accessed 9 November, 2009].
- Nebert, D. (Ed) (2004). Developing Spatial Data Infrastructure: The SDI Cookbook v.2, *Global Spatial Data Infrastructure (GSDI)*, at <http://www.gsd.org> [accessed 29 October 2009].
- Nielsen, P. (2006). A Conceptual Framework of Information Infrastructure Building: a Case Study of the Development of a Content Service Platform for Mobile Phones in Norway. A thesis submitted in partial fulfillment of the requirements for the degree of Doctor Scientiarum, Faculty of

- Mathematics and Natural Sciences, University of Oslo, Norway, January 2006. <http://heim.ifi.uio.no/~pnielsen/PHD/NielsenPetterThesis.pdf> (accessed: 29/07/2010)
- OECD (2001). *Citizens as Partners: Information, Consultation and Public Participation in Policy-Making*, Paris: OECD Publications (No. 52159).
- Obama, B. (2009). Transparency and Open Government. *Office of the President, United States of America*, at <http://www.whitehouse.gov> [accessed 29 November 2009].
- Rajabifard, A., T.O. Chan and I.P. Williamson (1999). "The Nature of Regional Spatial Data Infrastructures", *Presented at the AURISA Annual Conference, November 1999, Blue Mountains, Australia*.
- Rajabifard, A., M. F. Feeney and I.P. Williamson (2002). Future Directions for SDI Development, *Int. J. Applied Earth Observation and Geo-Information*, 4: 11-22.
- Rhind, D. (1999). *Key Economic Characteristics of Information*, Southampton: Ordnance Survey, UK.
- Scholten, M., R. Klamma and C. Kiehle (2006). Evaluating Performance for Spatial Data Infrastructures for Geoprocessing, *IEEE Internet Computing*, 34-41.
- Strain, L., A. Rajabifard and I. Williamson (2006). Marine Administration and Spatial Data Infrastructure, *Marine Policy*, 30: 431-441.
- Talero, E. (1997). "National Information Infrastructure in Developing Economies", in Brian, K. and E. Wilson (Eds). *National Information Infrastructure Initiatives: Vision and Policy Design*. Harvard Information Infrastructure Project, Harvard: Harvard University Press, pp. 287–306.
- Thellufsen, C., A. Rajabifard, S. Enemark, and I.P. Williamson. (2009). Awareness as a Foundation for Developing Effective Spatial Data Infrastructures. *Land Use Policy*, 26: 254-261.
- Ting, L. and I.P. Williamson (2000). "Spatial Data Infrastructures and Good Governance: Frameworks for Land Administration Reform to Support Sustainable Development", *Proceedings of the 4th Global Spatial Data Infrastructure Conference, March 13-15, 2000, Cape Town, South Africa*, at www.gsdi.org/capetown/masser [accessed 9 November, 2009].
- Tuchyna, M. (2006). Establishment of Spatial Data Infrastructure Within the Environmental Sector in Slovak Republic, *Environ. Model. Softw*, 21: 1572-1578.
- UNECA (2000). The Future Orientation of Geoinformation Activities in Africa. Committee on Development Information (Geo-Information Subcommittee),

United Nations Economic Commission for Africa (UNECA), Addis Ababa, 37p.

Williamson, I.P. (2000). "Land Administration Systems in Developing Countries", *Proceedings of the International Conference on Land Policy Reform, July, 2000, Jakarta, Indonesia*, at www.landpolicy.org [accessed 3 July, 2007].

Williamson, I.P., A. Rajabifard and M.E.F. Feeney (Eds) (2003). *Developing Spatial Data Infrastructures: From Concepts to Reality*, London: Taylor and Francis.

Yawson, D.O., F.A. Armah and A.N.M. Pappoe (2009). Enabling Sustainability: Hierarchical Need-based Framework for Promoting Sustainable Data Infrastructure in Developing Countries, *Sustainability*, 1: 946-959.