

# **Towards an Appropriate Framework for the Effective Utilization/Management of Geoinformation: A Case Study of Ghana**

**Benjamin Armah QUAYE, Ghana**

**Key words:** Geoinformation management, concurrence, land registration, inter-organisational collaboration, Ghana.

## **SUMMARY**

Access to reliable and affordable spatial information is a critical component of a country's economic, environmental and social development. Unfortunately this information which is mainly about tenure, values, use and condition of land, is normally collected and kept in separate databases (if any at all) and controlled by separate agencies. Overcoming the challenges of difficult inter-organisational relationships is not easily resolved. In Ghana, where there appears to be lack of cooperation among the various agencies and organisations involved in the management of land the impact on land administration/management leaves much to be desired. The paper presents the results of a research carried out to investigate inter-organisational collaboration efforts in the management of geoinformation in Ghana. It examines the institutional setting for land management in the country with a view to pointing to a more appropriate framework that defines the roles and responsibilities of the stakeholders as well as the rules and regulations to facilitate effective collection, storage, analysis and exchange of geoinformation. The inter-organisational difficulties are outlined and examined critically. A case study of the Concurrence (certification of customary land transactions) and Land Registration processes (which are part of the land management/administration system) was adopted. The main purpose of these processes is to ensure security of tenure for socio-economic development of the country. The key stakeholders in the processes are identified and their various roles and interactions examined with a view to identifying any hindrances in the sharing of information which are mostly spatially linked. The findings from the research are presented and discussed having in mind best practices around the world. In addition, the regulatory framework within which the activities of the organizations and the processes they are involved in is critically reviewed to ascertain their impact on the utilization of geoinformation. Based on the analysis of the findings from the research, pragmatic recommendations are made. These recommendations are aimed at ensuring that the land management system of the country takes full advantage of the potential of geoinformation.

# Towards an Appropriate Framework for the Effective Utilization/Management of Geoinformation: A Case Study of Ghana

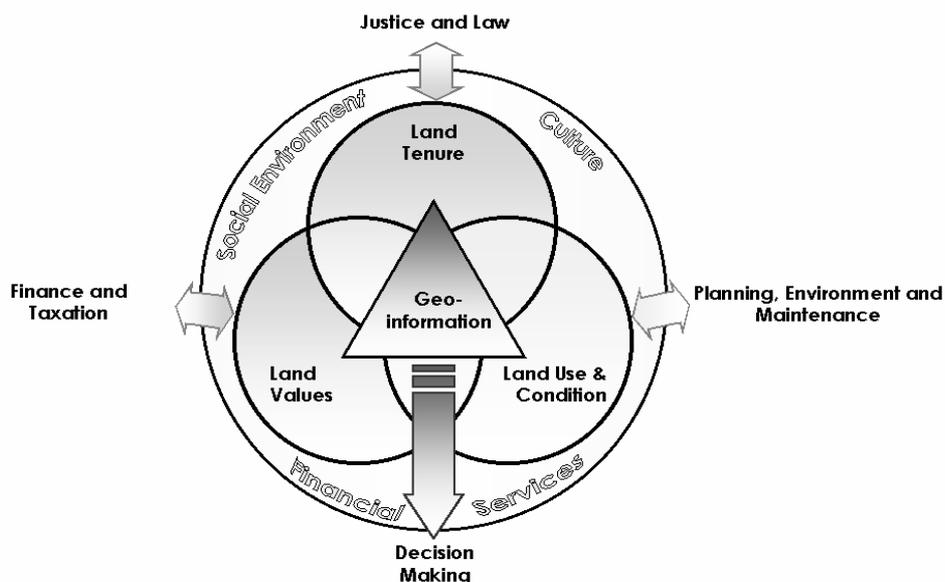
Benjamin Armah QUAYE, Ghana

## 1 INTRODUCTION<sup>1</sup>

Access to reliable and affordable spatial information is a critical component of a country's future economic, environmental and social development (Warnest, McDougall et al. 2003, p. 1). It has been established that to undertake effective and efficient land management, information about the land is needed (Fourie and Gysen 1996). This information is mainly about the tenure, values, use and condition of land, which are normally collected and kept in separate databases and controlled by separate agencies.

Geo-information - any information with location component - has the potential of being a central link with which disparate spatial datasets could be brought together and put to use through a common reference (Mansberger 2003, p. 4). This is depicted in Fig 1.

**Figure 1** Central Role of Geoinformation in Decision-making



Source: (Dale and McLaughlin John 1999) and (FIG 2002)

The mere availability of information is not sufficient; where it is stored and the ease and speed with which it can be retrieved are equally important. The success of any mechanism

<sup>1</sup> This paper has been written based on a dissertation by the author submitted as a partial requirement for a Master of Science Degree in Land Management and Land Tenure at the Centre of Land Management and Land Tenure of the Technical University of Munich, Germany (Quaye, 2005).

that aims at harnessing data from different sources for decision making would to a large extent depend on how effective members within the group responsible for the management of such data relate to each other.

### **1.1 Statement of the Problem**

In most developing countries, land related data are mostly kept manually and usually in analogue format. This has been a hindrance to the successful integration of such data and in Ghana, a developing country on the West Coast of Africa there appears to be lack of cooperation among the various agencies and organisations with responsibility to dealing with land management and land information. These agencies are enabled by different mandates, set of objectives and legislation which are often unclear and contradictory. It is therefore not uncommon to find different agencies collecting the same data at the same or different times for the same purpose leading to redundancy and waste of resources (human, financial and technical), which can be put to alternative uses or other development activities.

More than ever before, there is real need for the sharing of geoinformation in order to improve efficiency and effectiveness in the land administration/management system. This would mean that institutions/agencies will have to focus more on their main objectives and obtain their geospatial information needs from other agencies without need for initiating an independent data collection exercise. In this way duplication of data collection efforts would be minimized as far as possible.

### **1.2 Objectives**

This paper, presents the result of a study carried out to examine the institutional/organisational setting of land management with a view to pointing to a framework for effective and efficient use of geoinformation for land management.

## **2 THE INSTITUTIONAL/ORGANISATIONAL SETTING**

The 1992 Republican Constitution of Ghana recognises a dual system as far as the ownership of land is concerned. These are enacted legislation (formal system) and customary practices and usage (informal system). Whilst the former is written, the latter is mainly in oral form handed down from generation to generation. Kasanga & Kotey (2001, p 20) have acknowledged that whilst the two systems appear to operate together, the customary system is often weakened by the operation of the legal system.

There are numerous laws and associated subsidiary legislation that govern the land management and administration practice in Ghana. The National Land Policy has outlined 166 of such legislation (and this is by no means exhaustive). Most of these laws which are scattered are unclear and often contradict each other.

Several organisations/agencies have also been established to implement aspects of these laws, thus, the land administration/management function is spread among several agencies which have separate mandate and focus. Six (6) of the agencies involved in this study are;

- The Lands Commission (LC)
- The Survey Department (SD)
- Land Valuation Board (LVB)
- Land Title Registry (LTR)
- Office of the administrator of Stool Lands (OASL)
- Town and Country Planning Department (TCPD).

Whilst the functions of the various agencies may appear to be well spelt out, there appears to be certain grey areas such as unclear roles and responsibilities which have the potential of contributing to inaction on the part of the agencies.

The land administration/management system in Ghana has been described variously as inefficient, chaotic and fragmented and the National Land Policy (1999) has identified the following fundamental problems;

- general indiscipline in the land market, characterised by land encroachments, multiple land sales,
- use of unapproved development schemes, haphazard development,
- indeterminate boundaries of customary-owned lands, resulting from the lack of reliable maps and plans,
- conflicting land uses etc.

## **2.1 Organizational Arrangement**

Out of the six agencies, the Lands Commission, Land Title Registry, Survey Department, the Office of the Administrator of Stool Lands and the Land Valuation Board are administratively under the Ministry of Lands, Forestry and Mines. Even though this arrangement has the potential of ensuring effective linkages, this appears not to be the situation in practice.

Until recently the Town and Country Planning Department was administratively under the Ministry of Environment, Science and Technology and politically under the Ministry of Local Government and Rural Development. However, in a recent realignment of Ministries, the two Ministries were to a large extent merged.

It is also observed that none of the agencies have district offices in all the 138 districts in the country.

### 3 THE CASE STUDY

The concurrence and registration process, a conduit through which the customary/informal system is brought into the formal system is used as a case study to assess the effectiveness of the use of land related information. The activities involved in the process of concurrence and registration are not isolated actions but part of a continuum of activities in the land administration system and involve the interactions of several agencies. The objective of the process is to provide relevant information for decision making and ultimately ensure security of tenure needed for socio-economic development of the country.

**Concurrence** is a process of certification of customary land transactions. The 1992 Constitution of Ghana provides that *there shall be no disposition or development of any stool land unless the disposition is certified by the Lands Commission as conforming to a development plan drawn up*. This certification process is applicable to a species of customary land known as Stool/Skin lands (a communally owned land held in trust for the community or group by a traditional authority known as a stool or skin).

**Registration** is a process of ensuring security of tenure to holders of interest in any piece of land through the recording of rights in land. It is subsequent to the concurrence procedure. Currently, there are two (2) systems of registration in operation in the country. The Lands Commission has been operating the Deeds Registration system for the whole country under the Land Registry Act of 1962. In 1986, Land Title Registration was introduced under the Land Title Registration Law (PNDC Law 152) of 1986. This new system which is under the Land Title Registry (LTR) is in operation in almost the whole of the Greater Accra Region and parts of Kumasi in the Ashanti Region.

#### 3.1 The Phases in the Concurrence and Land Registration Process

In the Concurrence and Registration process, six (6) key and distinct phases can be identified:

- Land Use Planning and Implementation
- Survey and Demarcation
- Certification and Plotting
- Stamping and Valuation
- Rent Collection and Disbursement
- Registration.

The relationships of these phases and the interactions of the agencies are depicted in Figure 2.

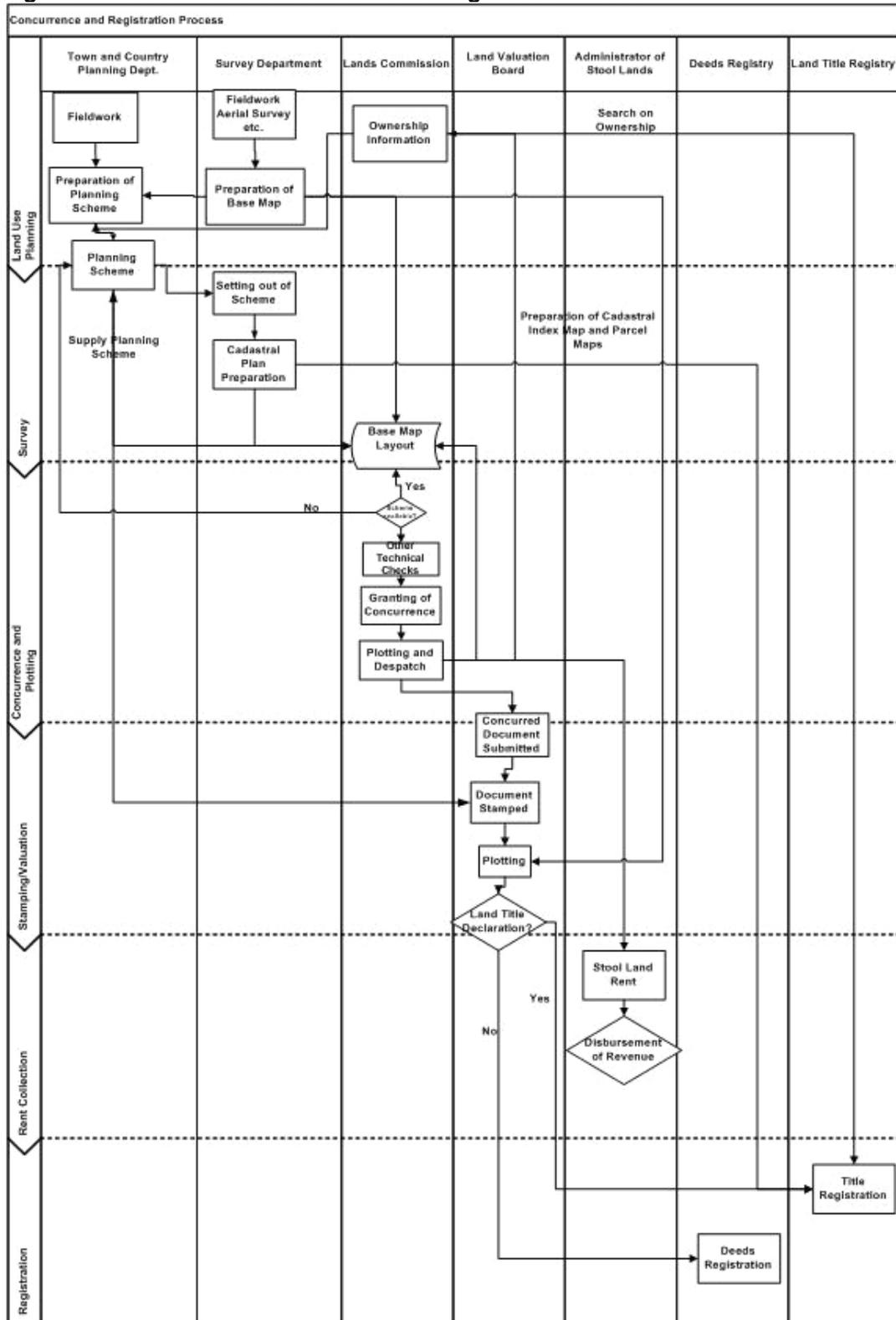
#### 3.2 Information and Data Needs

**Table 1** presents at a general level the basic data needs of the agencies in their activities in the processes of concurrence and registration. It is observed from the matrix that the Survey Department, Lands Commission and the Town and Country Planning Department requires/produce most of the core data sets. For instance Topographic Base Maps which form

the bases upon which all other thematic datasets may be linked, are produced by the Survey Department.

Any problem associated with the production and distribution of the base data would have an unintended ripple effect on the activities of the other agencies. This would eventually affect the overall purpose of the land registration and concurrence process which is to ensure security of tenure.

**Figure 2 Phases in the Concurrence and Registration Processes**



Source: Quaye (2005)

**Table 1** Data Needs of Agencies

Organisation Spatial & Attribute Data	SD	LC	LVB	OASL	T&CPD	LTR
Geodetic	X					
Topographic (Base) Maps	X	X	X	X	X	X
Administrative Boundaries	X	X	X	X	X	X
Cadastral/land ownership boundary	X	X	X	X		X
Transportation/roads	X		X		X	
Land use/zoning	X	X	X		X	
Physical features/buildings	X		X		X	
Land value		X	X	X		X

Source: Quaye (2005)

**Table 1** has been decomposed in **Table 2** to show in greater details the data requirements, their sources and any constraints in their utilisation. For instance, parcel information which basically provides the description, size, location and use of a parcel of land is produced by the Survey Department and the Town and Country Planning Department. Land tenure data on the other hand which relates to the rights/interest, term and restrictions that goes with any parcel of land is produced by the both the Lands Commission and the Land Title Registry. It was observed that there appears to be duplication in the collection and use of data sets.

**Table 2** Details of Data Needs and Sources

<b>Data Type Spatial/Attribute</b>	<b>Actors</b>	<b>Role</b>	<b>Frequency</b>	<b>Format</b>	<b>Sources of Data</b>	<b>Purpose</b>	<b>Remarks</b>
<b>Topographic Base Maps</b>							
	(SD)	Producer	Often	Digital/ Analogue	Field data - surveyors Aerial photos Satellite data	Urban Planning, land title registration, land use maps, etc.	Large scale base maps (1:50,000, 1:2500) covers only major towns and cities
	(LC)	User	Periodically	Analogue	SD	Use for recording land transactions (leases etc)	-Poor state of the sheets -lack of update
	(TCPD)	User	Often	Analogue	SD	Used for planning scheme preparation	Non availability resulting in inaccurate layouts
<b>Land Use/Zoning</b>							
	TCPD	Producer	Often	Analogue	SD, Fieldwork SSD	For orderly development activities to take place	Lack of base maps affect quality coverage of planning schemes produced. Not supplied to user agencies
	SD	User	Periodically	Analogue	TCPD	Set out schemes on the ground for development	Non supply of layout – inability to implement layout
	LC	User	Often	Analogue	TCPD	Granting of Concurrence and Consent	Delays in concurrence and quality of recorded data
<b>Parcel Information</b>							
	SD	Producer	Often	Analogue	Fieldwork Private Surveyors	Provide Survey description, size (acreage) and location of plot and cadastral/registry plan	
	TCPD	Producer	Often	Analogue	Fieldwork	Creates plots in planning schemes and determine their use	
	LVB	User	Periodically	Analogue	LC	Requires Acreage, Location and	

<b>Data Type Spatial/Attribute</b>	<b>Actors</b>	<b>Role</b>	<b>Frequency</b>	<b>Format</b>	<b>Sources of Data</b>	<b>Purpose</b>	<b>Remarks</b>
					Land Documents	Use for valuation purposes	
	OASL	User	Occasionally	Analogue	Land Documents	Requires Acreage, Location and Use in carrying out rent reviews	
	LC	User	Often	Analogue	Land Documents SD	Records Acreage, Location and purpose - for rent assessment and determination of fees	
	LTR	User	Often	Analogue	Land Document SD	Cadastral plan for Title Certificate	
<b>Land Tenure</b>							
	LC	Producer	Daily	Analogue	Clients	Records type, term, rights, restrictions as well as parties to a transaction.	
	LTR	Producer	Daily	Analogue	Clients LC	Records type, term, rights, restrictions	
	LVB	User	Periodically	Analogue	Clients LC LTR	Requires type, term, rights, restrictions for valuation purposes	
	OASL	User	Periodically	Analogue	LC	Requires type, term, rights, restrictions for assessment of rent payable	
<b>Land value</b>							
	LVB	Producer/ User	Often	Analogue	Clients, Private sector	To assist in carrying out valuations	Responsibility to create a land value database based on assessments made and lodgement of values by the public/private sector.
	LC	User	Periodically		Clients LVB	Relies on data to assess ground rent and other charges	

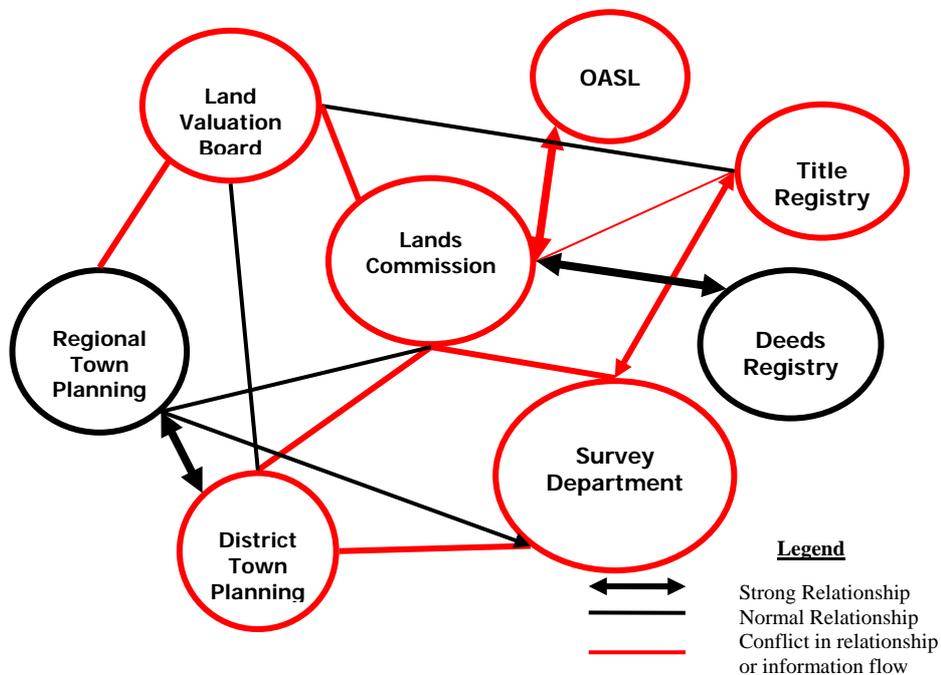
Data Type Spatial/Attribute	Actors	Role	Frequency	Format	Sources of Data	Purpose	Remarks
	OASL	User	Periodically	Analogue	LC LVB	Relies on data to assess ground rent and other charges	
<b>Buildings and other construction data</b>							
	LVB	Producer/ User	Often	Analogue	Fieldwork	Uses data to determine value of properties	
	TCPD	Producer/ User	Periodically	Analogue	Field work SD	Take data into consideration in designing planning schemes	
	SD	Producer/ User	Periodically	Analogue	Field work	Picks this data as part of topographic map production	
<b>Infrastructure</b>							
	Utilities	Producer	Often			Supply of Services to customers	
	TCPD	User	Periodically	Analogue	Utilities	Take it into consideration in preparing layouts	
	LVB	User	Periodically	Analogue	Utilities	Helps in determining the values in an area	
	District Assemblies	User	Often	Analogue	Utilities	Maintenance and development	

Source Quaye (2005)

### 3.3 Inter-Organisational Interactions

In the interactions of the agencies in the phases outlined above it was observed that there were certain constraints and this has been depicted in Fig 3. This, to a large extent impacts on the effectiveness/efficiency in the sharing of information.

**Figure 3** Inter-organisational interactions



Source: Quaye (2005)

## 4 SYNTHESIS OF CONSTRAINTS

Based on the analysis of the information needs and interactions of the various agencies presented in the preceding section the constraints identified are synthesised into comprehensive components below:

### 4.1 Poor Organizational/institutional Arrangement

- It was observed that the focus in the land management system has been on functions rather than processes. There was therefore **inter-organisational rivalry** among the agencies. For instance, the Lands Commission (LC), under whose supervision Deeds registration is operated, and the Land Title Registry appear to be in competition rather than working in collaboration to achieve a common purpose.
- The LC keeps records of certain particulars regarding land transactions (the parties, the term, consideration, user and caveats among others), the LVB as well as the OASL also records these same data, clearly depicting **duplication of work**.

- **The mandates** of some of the stakeholders appear to be conflicting. There appears to be no clear demarcation of responsibility between the LC and the OASL as to who is responsible for the subsequent revision of ground rents reserved in lease documents. The LVB, mandated to carry out all valuation activities for government agencies, is not involved in the assessment and revision of these rents. Furthermore, even though the 1992 Constitution mandates the OASL and the LC to work closely together, there was lack of adequate coordination and consultations between them.
- In general, it appears the land sector agencies do not see themselves as part of a continuum of processes leading to the achievement of an overarching goal. In recent times however, efforts have been made to improve the linkage between the LC and the LVB in the registration of interests in land.
- The Survey Department and the Town and Country Planning Department are reluctant to provide each other with relevant data for the proper preparation and demarcation of planning schemes. Some of the agencies consider the data as protected and therefore “*unshareable*”.

#### **4.2 Lack of Comprehensive Training Policy**

- Another observation made was that none of the land sector agencies had any comprehensive training policy in place to train all level of staff in modern methods of information management. Those that have had some training are often under utilised due to lack of equipment and a pragmatic strategy to tap their expertise. The irony of the situation is that, as a result of the low remuneration, the few who have been trained have joined the “*exodus train*”.

#### **4.3 Inadequacy in Data Management**

- Information is not seen as a corporate resource which must be used to benefit the functions of the various organisations in fulfilling their mandates. It was not clear which organisation was producing which data and the quality of the data. This to a large extent leads to duplication of efforts by the agencies.
- Knowledge of existing datasets is usually known to only certain key persons. In the event that these personnel are not available, the valuable knowledge is lost forever.
- To some extent there is incomplete coverage of some data. For instance, the Survey Department had not been able to produce topographic base map of the scale 1:2500 to cover the whole country. This has the tendency to affect the work of the other agencies that rely on it for their work.
- None of the agencies had a well defined/functioning computerised information system for the collection, storage and retrieval of data. With the exception of the Survey Department which had some level of digital mapping system in operation, the other agencies operated mainly in a manual system - vital land information is stored in cabinets which are not adequately protected from the vagaries of the weather leading to their deterioration at a fast rate. Retrieval of data was difficult and the updating of the record sheets is often tedious if not impossible. The implication is that, vital information required for decision making are often difficult to find or when available unreadable.

#### 4.4 Poor Supervision of Private Sector Surveyors

- Even though the passage of the Survey (Supervision and Approval of Plans) Regulations (LI 1444) was intended to strengthen the supervisory role of the Survey Department (SD) in the survey and demarcation process, it appears the exact effect has not been achieved. The SD has been inundated with a lot of requests for approval of plans which they appear not to be capable of handling in an expeditious manner. The result is that there are undue delays in the concurrence and registration process. Clients and some unscrupulous surveyors therefore seek to find unconventional ways of circumventing the regulations.
- The Ghana Institution of Surveyors (GhIS) a professional body, is not involved in the licensing of private land surveyors in the country. It cannot therefore apply its professional ethics on any recalcitrant surveyor.

#### 4.5 Absence of Leadership

- There is in place a National Framework for Geoinformation Management (NAFGIM) which is currently hosted by the Environmental Protection Agency (EPA). However, because the EPA is not actively involved in land management, it is not performing the expected leadership role. In addition, there is no law compelling all the land sector agencies to actively participate in the NAFGIM. There was therefore no effective platform for ensuring inter-agency collaboration resulting in unclear direction among the agencies, for instance in terms of standards to be followed for effective data integration.

### 5 TOWARDS AN APPROPRIATE FRAMEWORK

Given the constraints outlined above, there is clearly the need for a new framework to be defined that would ensure that there is effective mechanism in place for the use of geoinformation. Issues that would have to be taken into consideration in this direction are outlined and discussed below.

#### 5.1 Organisational and Inter-organisational Framework

One of the main objectives of the on-going Land Administration Project (LAP) is to bring together the all the land sector agencies under one umbrella to provide a One-Stop Service. Even though this objective is in the right direction, it is, respectfully, suggested that the focus of the institutional reform should first be directed at an analysis of the existing processes of the various agencies in the land sector with a view to identifying their *core processes*. Based on the analysis, the salient processes should be identified and those that are found to be duplicated should be synchronised to ensure a seamless connection. It is these processes that must be targeted for improvement. Those processes that do not add value to the entire process but tire up resources should be targeted for outsourcing or elimination.

It is only after the re-engineering of the business processes has been done that any attempt should be made to bring together the land sector agencies.

## **5.2 Data Management Policy Framework**

It is recommended that a policy framework should be formulated that specifically defines mechanisms for data exchange and management of geoinformation. This would include the setting up of procedures, and rules to guide inter-organisational interaction, and to structure and integrate organisational entities, functions, and processes. The structure should specify the roles, obligations, rights and procedures of each of the agencies. It is also important that each organisation have a clear and well defined policy for data distribution.

In this direction it would be appropriate to consider how the advantage given by the development in the Information and Communication Technology field could be capitalised to leap frog the country.

## **5.3 Human Resource Development**

In this direction, it would be appropriate to have a comprehensive training policy aimed at ensuring that all level of staff members in the land sector agencies are exposed to modern trends in the field of land management/administration. The training programmes should relate to new techniques and tools in information handling.

## **5.4 Lead Agency**

In addition, since it is clear that the EPA's role as the host organisation under the current National Framework for Geoinformation Management (NAFGIM) structure is inappropriate, it is suggested that the Survey Department, which is to be responsible for the envisaged Geospatial Framework under the LAP, should be an appropriate candidate to host the NAFGIM (or any new form that it may take). It is however, necessary for a legal instrument to be passed to give backing to the framework that would ensure active participation of the members.

## **6 CONCLUSION**

The paper has examined the concurrence and registration process in Ghana as a case study of the interactions of stakeholders in the management and utilisation of geoinformation. It has identified and analysed the key processes and phases involved. It has been established that the key stakeholders in the management of geoinformation are varied and in their interactions certain constraints are encountered which needs to be addressed to ensure effective utilisation of geoinformation.

In conclusion, it can be stated that the success of any effort at improving the management of geoinformation would depend to a large extent on the availability of a long-term strategic vision and high level political support, the importance of a lead agency, a focus on key priorities, and the re-engineering of business processes.

## REFERENCES

- Dale, P. and D. McLaughlin John (1999). Land Administration. Oxford, Oxford University Press.
- FIG (2002). Land Information Management for Sustainable Development of Cities Best Practice Guidelines in City-wide Land Information Management, FIG.
- Fourie, C. and H. v. Gysen (1996). "Land Management and Local Level Registries." South African Journal of Surveying and Mapping **23**(6(142)): 353-359.
- Kasanga, K. and N. A. Kotey (2001). Land Management in Ghana: Building on Tradition and Modernity. London, International Institute for Environment and Development: 34.
- Mansberger, R. (2003). Geoinformation in Support of Decentralization and Community Empowerment. Addis Ababa, Economic Commission for Africa.
- MLF (1999): National land Policy document. Ministry of lands and Forestry, Accra (June 1999)
- Quaye, B. A. (2005). Inter-organisational Collaboration in the Management of Geoinformation.
- Warnest, M., K. McDougall, et al. (2003). Local and state-based collaboration: the key to unlocking the potential of SDI. Spatial Sciences 2003 Conference, Canberra, Australia.
- The Land Registry Act, 1962 (Act 122) Assembly Press Accra, Ghana
- Land Title Registration Law, 1986 (PNDC L152) Assembly Press, Accra Ghana
- Survey (Supervision and Approval of plans) Registration Assembly Press, Accra Ghana
- 1992 Constitution, Assembly Press, Ghana.

## BIOGRAPHICAL NOTES

Mr. **Benjamin Armah Quaye** is a Lands Officer and the Deputy Regional Lands Officer of the Ghana Lands Commission Central Region Office. He has 10 years experience in land management/ administration as well as appraisal of real estate. He holds a BSc degree in Land Economy (KNUST, Ghana), Professional Masters in Urban Land Administration (ITC, Netherlands) and Msc in Land Management and Land Tenure (Technical University of Munich), where he was awarded the Presidents Award as the Best Masters student for 2005.

He is a professional member of the Ghana Institution of Surveyors and a member of the Board of Examiners of the Institution. His research interests are in the field of application Information Communication Technology in land management.

## CONTACTS

Mr. Benjamin Armah Quaye  
Lands Commission  
P. O. Box 183  
Cape Coast  
GHANA  
Tel. +233243128201  
Email: benquaye@yahoo.com