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A case study of geo-ICT for e-government in Nigeria: does computerisation reduce corruption in the provision of land administration services?

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This paper examines the role of the Abuja geographic information systems as an e-government policy initiative for promoting the reduction in corruption in the provision of e-land administration services and good governance in general. The paper explores the contribution of e-land administration with regard to the different forms of corruption (i.e. fraud, forgery, multiple applications, bribery, nepotism and favouritism, and white collar malpractice) as well as the different services (i.e. legal searches, recertification of titles, granting rights of occupancy, consent to alienate and regularisation of titles). Generally, our findings suggest that corruption was reduced with the introduction of electronic services for the verification of land records through legal searches and the recertification of land titles. Yet, other forms of corruption, such as nepotism and favouritism, are persistent and increasing.

Keywords: Nigeria, AGIS, Corruption, Geo-ICT, Land administration

Introduction

Geographic information and communication technology (geo-ICT) initiatives in the public sector for the provision of land administration (LA) services are part of e-government policy initiatives for promoting good governance and development [**14**], [**23**], [**32**]. Examples of the application of the principles of good governance for LA affecting societal well-being include: equitable access to land and natural resources, security of tenure for all members of society, gender equality in access to land, transparency in decision-making regarding land and natural resources, rule of law and decentralised, efficient and effective LA [**25**].

However, to date, there is a dearth of empirical studies on the impacts of geo-ICT on societal well-being [**3**] (such as the reduction in corruption) in the public sector in general and in particular in the provision of LA services in the developing world. Abuja geographic information systems (AGIS) is a public sector geo-ICT project of the Federal Capital Territory Administration (FCTA) of Nigeria, launched in 2003. The project is intended to curb some problems of 'poor governance', including corruption, which is a critical societal problem in Nigeria [1], [**17**]. Abuja geographic information systems has the potential to improve the overall quality of governance [**25**] in Africa's most populous country and the political and economic powerhouse of West Africa, yet, with 70% of the people living below the poverty line [**12**]. Abuja geographic information systems presents us thus with an excellent opportunity to tackle the empirical gap in a theoretically sound manner.

In the Federal Capital Territory (FCT) of Nigeria, problems in the provision of LA services before AGIS was implemented included unattended applications, multiple land allocations, illegal and unclear situations of land allocation, mismatches in land use and forgery of land documents [**19**]. To solve these problems, AGIS computerised the processes of land allocation, property search and verification of land records as well as the preparation and issuance of rights of occupancy (RofO) and certificate of occupancy (CofO), evidencing title to land [**2**].

The aim of this paper is to ascertain the impact of AGIS on the reduction in corruption in the provision of LA services in the FCT of Nigeria and explore how electronic LA (e-LA) services contribute to good governance and societal well-being.

The rest of the paper is organised as follows. The next section presents our methodology. It is followed by a review and analysis of the literature providing the theoretical background for the paper. Thereafter, we analyse the case study and present our findings on the effects of AGIS on corruption and its contribution to promoting good governance, followed by conclusions.

Methodology

We adopt a case study methodology to examine AGIS in its natural setting and to explain the causal links

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between AGIS as a geo-ICT intervention and as an enhancer of societal well-being. Preliminary fieldwork was carried out in December 2007 and March 2008 to obtain firsthand knowledge and collect secondary data about our case. Acquiring the firsthand knowledge involved direct observation of AGIS activities, asking questions from the staff members of AGIS and users. Comprehensive data collection took place between 1 February and 1 May 2009. Additional data were collected in April 2010. Before the commencement of the data collection, principal organisations for primary and secondary data collections, potential interviewees and respondents to surveys were identified based on official stakeholders defined by AGIS. The official stakeholders are: service providers (public administrators, designers of the AGIS project and people who are directly involved in the implementation of the project) on the supply-side and the users of the services on the demand-side. Other organisations, such as anti-corruption and e-government agencies, were selected based on their relevance to our research goal. Letters of introduction were sent to individuals in the organisations by courier service before the data collection and also delivered by hand on the spot during the data collection. The numbers of the interviewees and respondents on the supply- and demand-sides are listed in Table 1. Data on what AGIS' stakeholders actually do with the services provided with geo-ICT, and about what they are substantially free to do with the services and contribution of the AGIS intervention to promoting good governance (focusing herein in terms of corruption and transaction costs reduction) are not easily accessible and available. This obliged collection of data from primary sources (surveys, interviewing and direct observation) and secondary sources (documents, archival records and physical artefacts).

Primary data collection through surveys was carried out in three sets. The aim of the first set of surveys was to discover how AGIS stakeholders perceive corruption in LA and to find out corrupt practices in LA before AGIS. Some of the questions used for the first set of surveys were adapted to our case from the 'corruption-IQ test' proposed by [**15**]. The second set of surveys was carried out to identify corrupt practices in LA and their causes before AGIS. The third set of surveys considered the impact of AGIS on corruption and malpractices in the delivery of land and property related services in the FCT. While the first two sets of surveys cut across both supply- and demand-side stakeholders, the third set of surveys involved only demand-side stakeholders. The supply-side stakeholders include the FCTA and AGIS, Julius Berger Nigeria PLC, Zenith Bank and eTranzact. On the demand-side are FCTA departments, mainly planning, LA, survey and mapping, which can be described as internal demand-side stakeholders because they are within the FCTA. The Federal Mortgage Bank of Nigeria (FMBN), Primary Mortgage Institutions and professionals (land surveyors, lawyers, estate valuers, town planners and engineers) and individual citizens are external demand-side stakeholders who use the services of AGIS outside the FCTA. In total, 300 questionnaires were distributed and 156 were returned, giving a response rate of 52%.

Table 1 Primary data collection from supply- and demand-side stakeholders

Interview group	Number of interviewees
Supply-side	20
Demand-side	28
Total	48
Survey group	Number of respondents
Supply-side	42
Demand-side	114
Total	156

We drew an explicit list of forms of corruption from the literature, e.g. [**7**], [**19**], [**22**] and [**36**]. The pertinence of the list of forms of corruption to LA in the FCT was discussed with both supply- and demand-side stakeholders and refined during the preliminary fieldwork and comprehensive data collection. For example, multiple land allocation was not identified as a form of corruption in the literature but was observed and endorsed by both supply- and demand-side stakeholders as a form of corruption during these discussions. Generally, ~93% of the respondents strongly agree or agree that corruption is an issue, which deserves attention in the provision of land and property related services in the FCT. This approach is collaborative, visible, defensible and revisable [**4**] and has been tested and applied in previous empirical studies [**26**].

Data were also collected primarily through 48 semi-structured interviews of supply- and demand-side stakeholders and at different (management, middle and operational/junior) levels in organisations/departments. Some of the interviews were digitally recorded with the consent of the interviewees and notes were taken in all cases. Additional primary data were derived from direct observation of GIS (processes, technology and people) at work in AGIS.

Secondary sources are in three categories. The first category is documents, such as laws, acts and official gazettes of the Federal Republic of Nigeria, briefs, reports and terms of reference for the AGIS project and extracts from national newspapers related to the case study. The second category is archival records, consisting of digital and hard copy maps, personnel records, guidelines, rates, revenue generation, workflows and old photographs. The third category is physical artefacts comprising hardware, software, computer networks (intra and inter) and the office premises (building, parking space and waiting room). In total, 83 pertinent secondary evidences were collected.

The analysis started with the transcription of digital voice files and field notes. The transcribed texts were assembled into six categories using codes prepared from the literature [**11**], [**19**] before the fieldwork and revised after the fieldwork. The codes are: background/history, actors' involvement, impacts of AGIS, the GIS (personnel, data, procedures and IT), malpractices, forgery and abuses, and finance and online services. All the secondary evidence was summarised with emphasis on corruption, LA services in the FCT and use of GIS and ICT. The coded interviews were also summarised in tables, which portray key opinions of the interviewees and the impact of AGIS on corruption in LA services. The data from surveys were recorded and analysed using Microsoft Excel for closed questions. Open questions were entered and classified into groups of similar opinions.

The primary and secondary data and coding allows us to corroborate evidence collected from one source with another. We searched for contrary evidence from other sources for any piece of evidence collected in each code. For each code, evidence collected from one source is either substantiated or refuted with evidence from other sources. A piece of evidence, which we cannot substantiate from at least one other source, is nullified.

We compare the demand-side stakeholders' opinion after their consideration of the prominence of forms of corruption in the provision of LA services in FCT, before AGIS (meaning before September 2003) and after AGIS (2009–2010). This was accomplished by asking the respondents to rank the prominence of each form of corruption before AGIS and after AGIS. We used a scale from 1 (strongly disagree), 2 (disagree), 3 (agree) and 4 (strongly agree), see [**15**]. The idea here is that the higher the value of a form of corruption in a period, the higher its occurrence for the period. It is important to note that these values are practically perceptions of corruption at two time periods (i.e. before and after AGIS), which were further verified with other data from interviews and written documents.

Case background and history

Abuja geographic information systems

The history of AGIS can be traced back to 2003, when the computerisation of the cadastral and land records of the defunct Ministry of the Federal Capital Territory (MFCT), now FCTA, started. Gazette No. 29, Vol. 92 of the Federal Republic of Nigeria of 27 April 2005 officially established AGIS as an agency charged with the responsibility for land matters in the FCT and the generation, management and administration of geospatial data. The agency was restructured in August 2008 to avoid what the then Minister described as functional overlaps with some departments of the FCTA. The overall idea was to realign AGIS to its goal of serving the geospatial needs of all departments of the FCTA and the citizens. However, >80% of the efforts of AGIS are meant to support LA and all fees payable to AGIS (in April 2010) are directly connected to LA.

The relevance of studying AGIS as an interesting geo-ICT intervention for the reduction in corruption is confirmed by the mission – to provide basic and quality services which every citizen is entitled to, in a quality, fair, honest, effective and transparent manner [http://www.abujagis.com/ (accessed 27 April 2011)] – of AGIS and the assertion by the Minister who spearheaded its establishment that 'reliance on manual land records by the defunct MFCT was prone to abuse, manipulation and forgery'.

The innovative elements of AGIS include the use of GIS, networks (intra and inter) and use of mobile phone and mass media to contact external demand-side stakeholders. Abuja geographic information systems plans to enhance transparency and good governance within Nigeria, with a computerised front and back office ('one stop shop'). Thus, one can consider AGIS as a geo-ICT project or e-government intervention par excellence. The case of AGIS is unique also in the sense that, unlike most of the e-government or ICT for development projects in Africa [**21**], AGIS is entirely funded by the federal government of Nigeria, and not donors.

Land administration services before AGIS

In line with the 1999 constitution of Nigeria and the Land Use Act (1978), the Governor of each state grants a right, called statutory RofO, to a citizen for land situated in urban areas. As specified in the Land Use Act, the right is usually witnessed by a CofO [**29**]. The power to grant RofO within the FCT is delegated by the President to the FCT Minister. The LA department of the defunct MFCT was responsible for the processing of the statutory RofO before the establishment of AGIS.

Another LA service operating before AGIS (and to date) is the processing of consent to alienate land. This is a process to secure the consent of the Minister of FCT to alienate (for example, through transfer or sublease) a statutory RofO. The Land Use Act stipulates that during the term of a statutory RofO, the holder of the right shall have the sole right to absolute possession of all the improvements of the land. However, the transfer, assignment and mortgage of the improvements on the land are subject to the approval of the Governor. In the case of the FCT, the Minister grants his/her consent. An alienation of statutory RofO is null and void in the FCT without the consent of Minister.

Literature review on e-government, corruption and e-LA

This section reviews the literature on good governance in LA and how computerisation ostensibly contributes to societal well-being by reducing corruption in the provision of core public sector services.

Good governance in LA and computerisation

LA is described as:

> *public sector activities required to support the alienation, development, use, valuation, and transfer of land* ***[11, p. 1]****.*

The processes of LA [**35**] such as registration of property rights, transfer of title, acquisition of land information, cadastral survey, land use planning, granting and issuance of property rights are vulnerable to various forms of corruption, such as bribery, nepotism and favouritism, fraud, and white colour malpractices [**22**], [**36**]. Nevertheless, their incidence depends on the political and institutional environment of the country in question [**39**]. Researchers and the international donor community have argued that e-government and geo-ICT can potentially improve the delivery of government services in LA organisations, and support effective LA systems [**14**], [**9**].

Generally, it is expected that computerisation will solve

> *problems of administrative inefficiency and financial haemorrhaging of the state apparatus, help define socio-economic visions, and enhance economic productivity* ***[31, p. 59]****.*

Another expected benefit of computerisation of the public services or e-government is the curtailing of corruption through proper record keeping [**30**], especially in the wider context of LA [**36**]. E-LA

> *is a major part of e-government and can be considered as a strong fundament for legal, administrative and technological structure for the entire public administration* ***[27, p. 1]****.*

Geo-ICT is central to the development of e-LA and land administration systems will increasingly be serviced by geo-ICT to implement e-government [**14**].

Reflection on e-government and human development

The United Nations 2001 Human Development Report anticipates that new technologies will lead to healthier lives, greater social freedoms, increased knowledge and more productive livelihoods. The developmental opportunities of geo-ICT as part of e-government therefore include overcoming corruption [**6**], [**9**] and ultimately bring benefits to society. However, research on geo-ICT and development is still dominated by unpersuasive and uncertain arguments about geo-ICT enabled socio-economic development [**6**], [**37**].

The provision of LA services involves costs on citizens, in terms of money, time, travels, queue, making payment, customising a product by users to personal requirements and being able to use a computer. These are referred to as 'consumer' transaction costs [**33**], which can be reduced due to the use of geo-ICT and the introduction of e-LA. But how can this be associated with a concomitant reduction in corruption? For example, if queuing is reduced through the use of geo-ICT in the collection and processing of requests, bribery to move a person's request ahead of others is also likely to be reduced together with other resources spent by citizens on economic and political corruption. The capacity of e-LA to support freedom from corruption, reducing transaction costs arising from mis-allocations, forgeries and frauds can improve the security of property rights and therefore be considered as a measure of socio-economic progress. For example:

> *secure property rights encourage people to invest their resources and protect their investments against expropriation* ***[20, p. 1234]****.*

Evaluation research is necessary to understand how geo-ICT as an e-government intervention can contribute to the realisation of the principles of good governance and to societal well-being. The evaluation can begin with a consideration of contemporary social and economic problems or what can be considered as 'society-based critical issues' **[37, p. 18]** in the country under study. Society-based critical issues, for example poverty and corruption, are serious and possibly dangerous problems, which demand attention. Corruption emerges from the literature as a serious issue in the provision of public services and as a societal menace in Nigeria [**17**], [**24**]. Former President Olusegun Obasanjo's declared on 29 May 1999 that

> *Corruption, the greatest single bane of our society today will be tackled head on; no society can achieve anything near its full potential if it allows corruption to become the full blown cancer it has been in Nigeria.*

A reduction in the various forms of corruption can contribute positively to societal well-being, especially in Africa, where corruption is regarded as a major stumbling block in the path to successful economic progress [**28**]. The research of Gyimah-Brempong on corruption, economic growth and income inequality in Africa [**16**] explicitly disclosed that: African countries can increase economic performance by reducing corruption, and the growth effect of corruption reduction is higher than the growth effect of foreign development assistance. Gyimah-Brempong **[16, p. 207]** submitted that

> *… increasing the well-being of the majority of citizens in African countries can be enhanced by reducing corruption.*

The reduction in corruption is pivotal to good governance and the development process of a country. Good governance contributes to societal well-being, because

> *… an effective state is vital for the provision of the goods and services – and the rules and institutions – that allow markets to flourish and people to lead healthier, happier lives …* ***[38, p. 824]****.*

International agencies claim that e-government initiatives should be measured by the degree to which they contribute to good governance, empowering people, raising human capabilities and increasing people's access to life choices and opportunities [**34**]. Likewise, independent and sustainable institutions for LA defining the nature of land and property and the rights and obligations recognised by the law [**33**] are essential for individuals to realise their freedoms and entitlements.

We distil three major claims from our literature review. The first is that corruption slows down social and economic development and lowers growth. Second, the processes of administering land, which is of fundamental importance in every society, are vulnerable to corruption. Third, e-government and e-LA have the potential to reduce corruption and contribute to societal well-being. The problem hitherto is the lack of conceptual clarity and dearth of empirical evidence on the role of e-government and geo-ICT in curbing corruption in LA services and how this contributes to promoting good governance.

Land administration services and AGIS

Granting of statutory RofO

The processing of granting of statutory RofO as discussed under the section on 'Land administration services before AGIS' is now supported with geo-ICT by AGIS. Prospective applicants (individuals and organisations) for a statutory RofO can download an application form online or fill the form online, print it and submit to AGIS office in Abuja. It is also possible to follow a process tagged '1 easy step', for a complete online application procedure. This eliminates the need to travel to AGIS office to submit a new application.

The processing of statutory RofO includes the seeking of approval of the Minister of the FCT. The step of seeking the approval is not automated and involves discretion on the part of the FCT Minister who holds the 'land in trust for the people' and is responsible for allocation of land comprised within the FCT.

Area councils' title regularisation

Abuja geographic information systems supports regularisation of 'customary titles' to land in the six Area Councils of the FCT. These are plots not issued by the authority of the Minister of FCT. They include the so-called 'customary letters of grants' ('customary RofO' and 'customary CofO'). A judicial pronouncement has declared such 'customary titles' in an urban centre as illegal. One of the respondents to our survey described regularisation as a way of correcting the mistakes made in the past:

> *… hitherto defective 'customary titles' are now getting regularised with proper valid statutory rights and certificates of occupancy. In a way it is an attempt to harmonise title issuance and a return to Statutory as well as ensuring proper land title security within the FCT.*

The completion and issuance of CofO for area council regularisation was estimated at 30% in December 2008. Our supplementary fieldwork in April 2010 does not show any significant improvement.

Recertification

This is the use of geo-ICT to authenticate all plots of land allocated within the Federal Capital City (FCC) before the establishment of AGIS and issuance of new CofO from a geo-database to ensure their correctness and protection from forgery. The process involves the withdrawal of all the old land title documents issued since the inception of the FCT and replacement with new ones that have more security features and are difficult to replicate illegally without being easily discovered. The completion and issuance of CofO for recertification was estimated at 90% in December 2008. Our supplementary fieldwork in April 2010 reveals that the recertification is as good as complete.

Legal searches

A legal search is a process whereby individuals and organisations or their representatives (for example lawyers, land surveyors and estate valuers) are allowed to ascertain the genuineness of landed properties before committing their resources into land transactions. The law enforcement agents can also conduct a search in the process of discharging their official responsibilities. The searches provide firsthand and reliable information about the validity of any title document emanating from the land office. The information from the process includes name of land occupier, history, restrictions, responsibilities and encumbrances.

Consents to alienate

The process of seeking the consent to alienate statutory RofO or any part by assignment, mortgage, and transfer of possession, sublease and subdivision of a plot of land into two or more parts, e.g. on devolution by death of the occupier of land, in the FCT is partially supported with geo-ICT. According to a supply-side stakeholder, not all the processes are computerised: 'not yet. We still do some manual operations'. Another claimed that 'emphasis is less on this now, because of other responsibilities like regularisation, Federal Housing Land, and so on'.

Computerisation of critical modules for e-LA

These are tasks that are crucial and facilitate the transition into e-LA. The tasks are computerised to different levels to aid the services listed above. The urban and regional planning and survey data are well computerised for the purpose of granting RofO and the authenticity of CofO is now verifiable via legal searches.

Other tasks that are computerised for e-LA are: street names and house numbers, revocation and reinstatement of RofO, and fiscal cadastre for billing and issuance of payment demand notice and property valuation. It was difficult to determine exactly the levels of computerisation during the fieldwork. However, in December 2008, the level of completion of e-payment was estimated at 20%, property valuation at 10% with street naming and house numbering fully computerised.

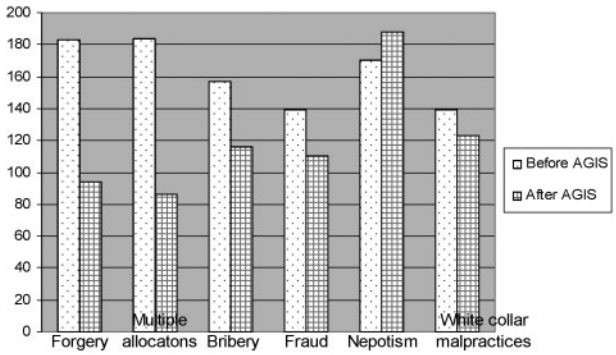
Effects of AGIS on forms of corruption in LA in the FCT

From the evidence collected through interviews and surveys, we describe the various forms of corruption in the provision of land and property related services in the FCT in Table 2.

Following the logic that development can be seen as a process of expanding the real freedoms that people enjoy

Table 2 Prominent forms of corruption in LA services in the FCT

Form of corruption	Description
Fraud	A deliberate deception or cheating in the calculation of land duties, tenement rates, withholding tax and all other taxes or fees related to land and property and pocketing of land revenue. Fraud also includes obtaining property by false pretence widely known as '419', meaning advance fee fraud.
Forgery	Creation of a false land document or alteration of a genuine one, with the intent to cheat or defraud. Since the goal of forgers is deception and cheating, forgery can be considered as a form of fraud. Eradication of forgery of land documents is a major concern of AGIS.
Multiple allocations	Deliberate allocation of one plot of land to more than one person or due to improper record keeping.
Bribery	A promise or offer in cash or kind to gain an illicit advantage in the operation of LA activities, such as processing of application for granting of statutory RofO, recertification and regularisation. The person who offers bribe (briber) is usually on the demand-side and the person who obtains the bribe (receiver) is on the supply-side. At times, there are persons who negotiate the bribery (mediator), intervene between the supply- and demand-sides, and make it less visible.
Nepotism and favouritism	Abuse of discretion for the benefit of friends, relatives and political allies (for example in the granting of statutory right of occupancy).
White collar malpractices	Conspiracy with public officers, which leads to premeditated neglect of proper procedures for personal benefits. For example in cases when official permits are issued to build on utility lines or corridors (sewer, water, and telecommunication lines).



1 An assessment of levels of corruption in the provision of LA services before and after AGIS

[**28**], we present an assessment of contribution of AGIS to societal well-being in terms of whether the freedoms that people have from each form of corruption identified in Table 2 are enhanced. We take a people-centric viewpoint by considering mainly the effects of computerisation from the perspective of the users or demand-side stakeholders. Observe that this does not mean that the opinions and views of the supply-side stakeholders were not considered or completely excluded. Our findings from interviews, surveys and secondary data sources are presented in Fig. 1.

Fraud

A respondent to our survey observed that the effect of AGIS on fraud is insignificant and the 'fraudsters and perpetrators of these crimes also improve in the devilish act everyday'. Our findings show that fraudulent practices are inseparable from forgery. The perpetrators of fraud fake official government receipts to divert land revenue to their pocket. The first measure put in place by AGIS to reduce fraud was to pay directly to banks and use bank tellers for land transactions. Now, any payment to AGIS is through bank draft, which is difficult to forge because of unique identifiers on the bank drafts. It is also difficult to use the same bank draft more than one time. The accounting system of AGIS is automated, the bank draft is scanned into the system and a receipt is generated from the process. The online services offered by AGIS include opportunity for e-payment, which obviously reduce fraud. However, the e-payment is limited to one medium (eTranzact), thereby diminishing the freedom to use other modes of e-payment such as Visa and Master Cards. Perceptibly, this does not reduce transactions costs for non-eTranzact users.

These efforts have increased the annual income to AGIS from an average of about N250 million (USD1·7m) per annum before AGIS to an average of about N5·2 billion (USD34·6m) per annum from September 2004 to November 2008. We observe that the rejection of cash transactions and workflow that checks for payment during the processing of services is largely responsible for reductions in pocketing of land revenue, consequently reducing financial haemorrhaging in the costs of enforcement of property rights by the FCTA. The reduction in the circulation of fake receipts reduced transaction costs and expanded the freedom of demand-side stakeholders when venturing into land transactions.

Forgery

Both the supply- and demand-side stakeholders stressed that the foremost criteria to measure the progress made by AGIS is freedom from forgery. According to a former Director of AGIS,

> *From where we started, we started in a very bad footing because historically the documents that we took over from the defunct MFCT, which are documents that have been operated manually, the registers, the records, and all the rest of them were done manually, some have been torn, some have been tampered with […] because of this porousness of the system then, you find out that even fraudsters took over the operations to an extent of even having a parallel office that runs side by side with the department of land administration and resettlement.*

A staff of the project's contractor remarked that 'The priority is not pushing files ahead of others, but to stop manipulations and forgery, etc.' All the respondents to our surveys either strongly agree or agree that forgery is an issue of concern. The impact of AGIS on eradicating forgery therefore turns out to be a main issue of practical interest to evaluate the capability of geo-ICT in reducing corruption and other transaction costs.

An interviewee on the demand-side of AGIS noted that if one gets the documents now '… there is full assurance that it is a genuine land'. Another demand-side interviewee noted that 'forgery is reduced now, because it is now easy to confirm the documents from AGIS'. A civil servant also on the demand-side opined that 'But the issue of forgery, I cannot say much about it because either computerised or not, documents can be forged'. Then, we observe that the facilitation of authentication of land documents is important for demand-side stakeholders to lead a life free of corruption. This is realised through legal searches. From the searches, demand-side stakeholders can discern between legitimate and illegitimate documents. We find out from an interviewee that 'the computerisation has helped in the storage and retrieval of land and property related information, but it is not so easy with forgery and other crimes/malpractices […] the criminals develop their own counter solutions. They use IT to produce the same set of documents' produced by AGIS. The opinion of another interviewee is that forgery still happens, 'but everything leaves a trace, everything can be detected. As long as human beings are working with the system, we cannot rule out this. We know the cases; we are working on better supervision. It (forgery) will never go than below/to zero, but better'. This opinion corroborates data from secondary sources, for example [**8**] who reported that the Police in Abuja arrested five people for allegedly producing and selling fake land allocation papers. The report further stated that the accused forgers usually carry out the crime in collaboration with insiders. The evidence shows that they were running an illegal office in parallel to FCTA/AGIS, because official stamps of various land issuing authorities, payment receipts, blank land allocation papers of FCTA and some area councils were among the exhibits recovered by the police.

From our surveys (see 'Methodology'), the sum of the value for forgery before AGIS is 184 and 94 after AGIS. Thus, the opinion of the respondents is that there were

more forgeries before AGIS than now; this is graphically presented in Fig. 1. If the value is zero after AGIS, then there is an 'ideal state' of total freedom from forgery. Evidence from three sources of interviews, surveys and documents revealed that the AGIS demand-side stakeholders have gained some freedoms to lead a life without being frustrated by fake land documents. However, slapdash and unsuspecting people are still constrained by forgery.

Multiple allocations

A respondent to our survey noted that 'the issue of multiple allocations is rare now' and another observed that AGIS 'has reduced to the barest minimum malpractices associated with land allocations, e.g. double allocation'. Perhaps, these show reduction in the incidence of multiple allocations after AGIS, but according to a respondent, 'AGIS should improve on the issue of double allocation'. A comparison of opinions of the demand-side stakeholders in Fig. 1 gives the same impression that multiple allocations have reduced, but still a noteworthy constrain. This lends credence to the observation that '… AGIS as it is today, you still have numerous plot duplication, multiple allocations…'. The opinion that 'but I know before then double allocation was very rampant, before the computerisation. But now, to the best of my knowledge, I think that has been reduced to the barest minimum' recapitulates the judgment of our interviewees.

The demand-side stakeholders now have more freedom from multiple allocations, because the system is designed to prevent reallocation of land that has been already allocated. The guard against multiple allocations is purely database driven. The allocation editor, file and plot validation, plot look-up and other spatial analysis functions of AGIS-land information system can automatically detect and warn against multiple allocations.

Bribery

Data collection on bribery was difficult during the fieldwork, because of its hidden nature. Only one of the respondents to our survey agreed that he/she paid to quicken or facilitate the processing of statutory RofO. However, some survey respondents agreed that they gave 'gifts' in appreciation of the LA services that they received. A survey respondent remarked that 'today, we can observe less corrupt practices by the AGIS civil servants. But this does not mean that there is no longer bribery …'. Figure 1 shows that the respondents judge the incidence of bribery as lower now, than before AGIS. One of our demand-side interviewees, who is a civil servant noted that respondents will not like to own up to giving bribe because '… in Nigeria if you give bribe you are an offender, if you take bribe you are an offender as well. Both of you are guilty of giving and taking, it's not one way, it's bi-directional'. The position of another interviewee is that 'in the old registry of FCT, when they ask me to give bribe, I said no. It's a capital NO. In AGIS now, I just drop my application. Most of the time, you don't have direct dealings with the guys. You just submit your application and go'. We sum up our findings on bribery with the comment of an interviewee that 'you can call it bribe or gratification or anything you like, the computerisation has reduced these problems, but mind you there are still other issues'. Cutting corners or what is locally referred to as 'chua chua' visibly exists as a form of bribery. Chua chua involves doing things in a disorderly manner. We recognise chua chua as bribery from the statement that 'most of the things I use to get, if people are getting it one week or two weeks, my own can take three months, because I am not ready to do chua chua. I am not ready to bribe anybody …'. An interviewee noted this and said that 'I know there is chua chua, chua chua is still there'. The online services expand freedom from some kinds of 'petty' bribery, such as the payment of trifling sum to get application forms and reduce the visibility of the activities of touts around the AGIS premises.

In our study of AGIS, we find that non-payment of bribe is largely due to two reasons. One, some interviewees will not pay bribe because they consider it immoral and illegal. The second reason is lack of resources to pay bribe. An interviewee puts it clearly to us that 'But, but I don't know anybody there and don't have money to bribe' and further reiterated that 'I don't have money for chua, chua. But, if I have I will give them, but I don't have. It's just a matter of using what you have to get what you want'. For this interviewee, bribery is a way to acquire property rights, but constrained by the resources to offer bribe. However, we reason that if the system is fair and transparent (as wished-for in the AGIS mission), the interviewee may not consider a bribe, except if he/she is committed to bribery as a means to lead the kind of lives that he/she values and have reason to value.

Nepotism and favouritism

This is observed as an issue that is cultural and not something to worry about. For example, an interviewee remarked that 'the civil servants have to favour their friends and help them to facilitate their applications'. Another interviewee responded that 'Jamaan ka, su ne arzikin ka', meaning 'your people/crowd is your wealth'. We observe that nepotism is still prominent or more prominent after AGIS as reflected in Fig. 1. It is grounded on the concept of 'man-know-man' as observed by some interviewees, 'If you know the minister, permanent secretary or senator, top civil servants and politicians, you will get land quickly'. 'They should give land to people that does not have connections. They should tell us where there are vacant lands and people that have land in Abuja'. 'They still have clicks, let them be open. I am not sure they are faithful; still behave like typical ministry people'. 'I had to seek the assistance of a colleague, a professional colleague who works there, and it was the fellow, the colleague that assisted me to retrieve the acknowledgment'. About 43% of respondents to our survey confirmed that they have received some kind of assistance from friends and professional colleagues working at AGIS/FCTA. Some of these practices are considered by some respondents as normal, and those that are unwilling to support or even favour friends, relatives and allies are considered as a foe and having no place or status in the society. However, a respondent to our survey remarked that rent-seeking by government officials still continued with the computerisation and this nearly derailed the good project. An interviewee directly put it that 'favouritism, for example for a Senator's wife will always be there'.

White collar malpractices

The demolitions of some buildings with 'approved' building plans demonstrated white collar malpractices as a form of corruption in the provision of LA services in the FCT. The citizens 'were lured into purchasing the illegal land and houses by a syndicate of land racketeers who connived with some staff of the FCDA to trade the properties to unsuspecting buyers' [**18**]. This secondary evidence does not contradict the position of some interviewees that 'abuses and malpractices, still going on, people use the boys that are running those things to change the records' and 'there were malpractices, abuses, etc in the old system, and they are still there'. Figure 1 shows that the substantive freedom from white collar malpractices is marginal. This is reflected in our surveys' responses, with comments such as 'malpractices have reduced, though not eliminated. Some new ones have also come up'. 'Computerisation cannot remove malpractices'. However, other respondents believe that 'it has checked malpractices and misconducts considerably. But, there are still some loopholes', 'reduced rate of malpractices and misconducts in general' and 'it makes people to know whether the allocation is genuine or fake, thereby reducing the rate of malpractices and misconduct'.

Overall, five of the six prominent forms of corruption in the provision of LA services in the FCT reduced with AGIS (computerisation) intervention. Our factual account of AGIS is that low human interference and higher levels of computerisation of LA services reduce corruption and transaction costs and can therefore promote good governance. Figure 1 presents the judgment of the respondents to our surveys on levels of corruption before and after AGIS. Table 3 shows the overall nature of the contribution of geo-ICT enabled services or e-LA services to societal well-being.

Evidently, citizens have more freedom from fraud and white collar malpractices. The impact of AGIS on nepotism and favouritism is uniquely different. A respondent to our survey, who has formal training in LA, opined that: 'AGIS is a welcome development; the major problem is nepotism and favouritism by the decision-makers or among politicians. The vesting of management of land solely on the political class is a problem. If all the procedures at AGIS are fully automated with minimum human interference, corruption can be eradicated in land administration'. An interviewee reacted that 'favouritism is a cultural thing. Whenever some has opportunity to take advantage of the system, they will. People think that it is their right to do what they are doing because; they have waited enough for it'. The situation is readily understood. Since the power to grant right to occupy and use land in Nigeria is constitutionally placed under the jurisdiction of the ruling class, unfaithful leaders can easily abuse the authority of their office to favour relatives, friends and political allies. Secondary evidence shows that 3645 plots of land were allocated within 2 weeks of 17–29 May 2007, when the Federal Executive Council had been dissolved [**5**]. The dissolution of the Federal Executive Council implies that there was no legitimate Minister of FCT to grant the allocation of land. The plots, which were allocated to relatives and political allies, were later revoked by the Senate [**13**].

Effects of AGIS on the satisfaction with the e-LA services

In this section, we will comment on the level of satisfaction with LA services supported by AGIS and effectiveness of the services specifically for promoting good governance and improving societal well-being through corruption reduction.

Granting of statutory RofO

The support of geo-ICT for the administration of land for the use and common benefit of all citizens is at risk because the critical aspect of approval of allocation of land is discretionary. Only 9% of the respondents to our survey are satisfied with the provision of the service of granting of statutory RofO, 36% are indifferent and 55% are unhappy with the service. Although the service of granting of RofO is largely computerised, it is not effective enough to serve majority of the citizens equitably, for example majority of Federal Housing Authority, Federal Government Houses and Area Councils' potential land occupiers have not received their certificates (in 2009). Evidences from primary and secondary sources reveal that the granting of RofO is particularly plagued with favouritism and nepotism, hence highly corrupted, leading to high transaction costs and not able to support the equity goal of good governance. Despite the reasonably high level of computerisation of the granting of statutory RofO, we find AGIS intervention as neither ineffective nor effective, and apparently with high transaction costs.

Area councils' title regularisation

The regularisation of titles in the area councils is not well-developed or has not received adequate attention. For example, the completion of regularisation and issuance of CofO for the people in the six area councils of the FCT was estimated at 20% in December 2008. Although our evidence does not show high levels of corruption in the service of regularisation, only ~11% of the respondents to our survey are satisfied with the provision of title regularisation. This substantiates the remark by a user that 'up till now, some of the documents submitted to AGIS, we have not been able to see the CofO, up till now' (17 April 2009). While the transaction costs observed are low, the implementation of geo-ICT is ineffective thereby contributing low to societal well-being.

Recertification

The support of recertification by AGIS was scheduled for nine months: 1 August 2004 to 30 April 2005. Our last fieldwork in April 2010 revealed that the exercise had been completed, if otherwise the outstanding is negligible. Recertification is largely a geo-ICT driven process to capture spatial data, attributes and title documents in the FCC to issue a new and more 'secured' CofO to evidence the granting of statutory RofO. The users, who are property owners in the FCC, are less peeved with corruption and for them transaction costs are low. Fifty-one per cent of the respondents to our surveys are satisfied with recertification, 27% are indifferent and 22% are unhappy. The recertification mechanism is effective with low transaction costs bearing out high contribution to societal well-being.

Table 3 A précis of the impacts of geo-ICT support in the provision of LA services in the FCT of Nigeria

LA services in FCT before AGIS	LA services vulnerable to corruption	LA services supported with geo-ICT	Forms of corruption that have decreased	Forms of corruption that have increased	Enhancing effects on societal well-being	Constraining effects on societal well-being
Granting of statutory RofO.	Granting of statutory RofO.	Granting of statutory RofO.	Forgery.	Nepotism and favouritism.	Trouble-free legal searches to confirm the status of property before purchase.	Limited online services: not all information (e.g. plot owners, vacant plots, value of properties, etc.) are provided.
Processing of consent to alienate.	Processing of consents to alienate.	Recertification and regularisation of land titles.	Multiple allocations.		Security of landed property, confidence in land transactions and promotion of property and estate business.	Limitations in e-payment: only one option.
Verification of land record.	Verification of land record.	Verification of land record (legal searches).	Bribery.		Decrease in fear of double or irregular allocations and reduction in the effects of forged documents, such as trauma and loss of money.	Periodic failure of website (abujagis.com).
Revocation and reinstatement of RofO.	Consent to alienate.	Consent to alienate.	Fraud.		Ease of processing of recertification.	Delay of documents: certificates of occupancy and consents.
Consent to alienate.			White collar malpractices.		Knowing the status of a plot at a dial.	No transparency in the granting of statutory RofO/favouritism in granting of statutory RofO.
					Less apprehension about bills and increased land revenue.	All services are located at the headquarters, including the only electronic customer service centre.
					Ease of confirmation of land documents to secure housing loan from Primary Mortgage Institutions without the gratuitous payments.	

Legal searches

Abuja geographic information systems reduces the forgery of land documents to demand-side stakeholders. This is mainly due to the design of AGIS and online services, which provides opportunities to validate the legitimacy of documents through legal searches. About 92% of the demand-side stakeholders who responded to our survey are satisfied with the provision of the service of legal searches. Legal searches are less plagued with corruption; they reduce transaction costs and provide a high contribution to societal well-being.

Consents to alienate

The consents to alienate are normally granted by the FCT Minister and Governors, in the case of states in Nigeria. The workflows for consents are not fully computerised; applicants are compelled to wait for an approval, which involved ennui bureaucratic procedures, leading to high transaction costs, but seldom afflicted by corruption. Although low corruption is associated with the provision of consents to alienate, the implementation is still ineffective to generate growth for the citizens and contribute to societal well-being.

It is worthy of note that while we observe low corruption in consents to alienate, as before with the support title regularisation, its contribution to societal well-being is low because they have received low attention in terms of application of geo-ICT. The desires of the majority of the potential title owners and occupiers of land were rarely met; few respondents (15%) were satisfied with the service of consents to alienate.

The administrators of AGIS and FCTA recognise that reduction in corruption in the provision of LA services cannot be achieved solely through the use of geo-ICT. They sought the assistance of the Independent Corrupt Practices and Other Related Offences Commission (ICPC) and Economic and Financial Crimes Commission (EFCC) in investigating cases of corruption in land matters. For example, the ICPC filed a case, which involves a staff (or former) of the FCTA at FCT High Court in Maitama, Abuja. It is recently reported that

'… seven years after, the Abuja Geographic Information System (AGIS) was still at its infancy, thereby making it susceptible to manipulation of Land Information System as well as other irregularities' **[10, p. 80]**. One of the respondents to our survey pointed out that 'what we can see today is that AGIS has only shifted corrupt practices to higher level. Corruption is no longer open as in the past but, it is till there, but less visible'. According to a respondent, 'computerisation may not prevent some of these issues of corruption if there is no political will to stop it'.

Conclusions

This paper assesses the effects of the use of geo-ICT by AGIS on corruption reduction in the provision of LA services in the public sector of Nigeria and presents an outlook of how the services supported with geo-ICT can contribute to good governance and societal well-being. Our empirical findings, summarised in Table 3, reveal that the e-LA services of recertification and legal searches (characterised by less human involvement) reduce corruption and have a high contribution to promoting good governance and improving societal well-being. We observe low levels of corruption in the provision of the services of title regularisation and consents to alienate. However, the contributions of the two services to promoting good governance and improving societal well-being are minimal.

The facilitation of the granting of statutory RofO with geo-ICT is yet to contribute to societal well-being. The e-LA service for the granting of the statutory RofO received most criticisms throughout our study of AGIS and does not promote good governance and improve societal well-being. For example, recall that only 9% of the respondents to our survey are satisfied with the provision of the service of granting of statutory RofO. Herein, we deduce that geo-ICT or electronic services do not drive, but enable corruption reduction in the provision of LA services, which then contributes to promoting good governance and improving societal well-being. The degree of enabling by geo-ICT is however, dependent on the people (service providers and users). This is clearly recognised by one of our interviewees, who remarked that 'as long as human beings are working with the system, we cannot rule out this [corruption]'.

The capabilities offered by AGIS to rapidly display land information do support decision- making and enhance the property market through legal searches and reduction in circulation of fake land documents. Yet, they also intensify nepotism and favouritism. Decision-makers readily have access to land information to support decision-making in granting RofO to allies. Overall, we find out that forgery, multiple allocations, bribery, fraud and white collar malpractices decline. On the other hand, nepotism and favouritism is a unique form of corruption on the increase.

Further studies are necessary to advance knowledge on why the use of geo-ICT in support of LA or why the provision of e-LA in the FCT is still susceptible to manipulations and irregularities. We particularly suggest the impact of policies, legislations, norms and rules of conduct on the societal benefits of AGIS. The findings of our study can encourage researchers to take a closer look at why and how the society is benefitting from geo-ICT implementation in the public sector or e-government policy initiatives. This study can also inform practitioners about the pervasiveness of factors not deeply rooted in standard technical solutions of geo-ICT implementation for e-government.

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