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Compliance with Residential Building Standards in the Context of Customary Land Tenure System in Ghana

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Zoning regulation is considered as a tool used by government to control developments to ensure sustainability. In Ghana where about 80% of lands are held under customary land tenure systems, implementation of residential standards, which is a government function may conflict with customary norms of holding land. This paper uses case study to examine the implementation of residential policies and enforcement of residential standards in areas under customary land tenure in Ghana and if these policies and standards affect the enjoyment of land rights in the context of customary land tenure.

Results showed that non-compliance to residential standards and non-conformity to the local plan has minimal interference on enjoyment of land rights. Residents are ignorant of the details of the residential standards and have never seen a zoning regulations document. There is also low level of monitoring and enforcement. Spatial analysis reveals four main types of non-conformity between orthophoto and local plans i) discrepancies in the orientation of the parcel boundaries, ii) discrepancies in the shapes of plot boundaries, iii) houses constructed on the plot boundary or straddle parcel boundaries, and iii) differences in plot sizes. Results suggest the need for planning authority to use efficient approaches such as GIS and UAV's to communicate, monitor and enforce the residential standards. It is concluded that collaboration between customary land authorities and the Municipality during the allocation and development of plots may improve spatial conformity between orthophoto and the local plans.

Keywords: Residential standards, Customary land tenure system, Land rights, Compliance.

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Introduction

Land tenure systems are set by the laws governing land in a country. This can be statutory, common law or customary. Many at times, a mixture (legal pluralism) exists in a country. Most peri-urban areas in sub Saharan Africa operate in a pluralist environment where statues and customary laws, government and indigenous institutions, traditional norms and corporate values run parallel. Ghana has a dual system where statutory and customary land tenure systems run parallel in urban, peri-urban and rural areas. Customary lands constitute about 80% of all lands in the country whiles the remaining 20% is owned by the state (Adu-Gyamfi, 2012). Customary lands are managed by chiefs, skin and family heads in trust for the people. This implies that, while access to land is controlled by customary custodians, management through planning comes from the District Assemblies. The mode of land alienation and tenure system can therefore have implications for planning.

Land use planning, a regulatory component of the land administration paradigm (Williamson et al, 2010) ensure sustainable use of land as a natural resource. Land use plans are commonly implemented and enforced through zoning and accompanying regulations. It creates the conditions required to achieve an environmentally sustainable, socially just, desirable and economically sound land use and ownership type (GIZ, 2012). It specifies where permissible land uses such as residential, industrial, recreational or commercial may take place (Onsted & Chowdhury, 2014). Zoning eliminates conflicting uses by protecting the environment, provide amenities and control nuisance thus enhancing land values (Boamah, 2013; Yeboah & Obeng-Odoom, 2010). Thus residential areas are protected from being invaded by commercial and industrial activities and also promote the orderly development of industrial and commercial areas. According to Pressman & Wildavsky (1973), as cited in Loh (2011), the purpose of planning is to control future development, therefore, if this is not achieved then planning has failed.

There are a number of regulations that bond the allotting of residential lands. Such standards prescribe; the land coverage, the form of constructions, the housing density, maximum building heights, environmental protection requirements etc. This is to provide adequate light, good air circulation, protection from fire, overcrowding on land etc. These aims have been challenged over the years by land developers and administrative challenges faced by planners. Arguments against residential building standards are associated with additional cost, delay housing production and lengthen construction process (Mayer & Somerville, 2000; Quigley & Rosenthal, 2005). Another argument put up by UN Habitat (2008) is that land use and zoning affects land rights of people especially those in informal settlements as they are forcefully ejected to pave way for developmental projects because they do not have title to land and means to implement new regulation. Also tenure security may be threatened when acquisition of building permits is expensive and time consuming thus delaying ones right to develop land.

Enforcement mechanisms compel landholders to implement and adhere to the residential standards. Specific enforcement tasks may include: detecting buildings without permits, assessing building plans for compliance with the standards, inspecting buildings during construction for adherence to the residential buildings standards and prescribing appropriate corrections for non-compliance (Schilling & Hare, 1994; Boamah, 2013). Where there is non-compliance, sanctions such as ‘stop work’, fines and demolishing are sometimes used to bring compliance (Arimah & Adeagbo, 2000; Burby, May, & Paterson, 1998). Attributes such as weak enforcement mechanism, complex bureaucratic procedures, Limited resources and

qualified staff (Payne & Majale, 2004; Goodfellow, 2013) can affect effective enforcement. Studies conducted by Arimah and Adeagbo, (2000) in Nigeria showed that fines and 'stop work' were ineffective in enforcing zoning regulations. However, when severe sanctions and penalties such as demolishing are used to enforce regulations, it leads to compliance by new developers.

A number of factors influence the willingness of landholders to comply with the residential standards. Such factors include income levels, educational level, household size and awareness of zoning and residential standards (Alnsour and Meaton 2009). Household income can be linked directly to some aspects of the construction process such as area of the house, design and quality (Fekade, 2000). In countries where earnings are generally low, the extent of compliance can be positively related to the level of income (Alnsour & Meaton, 2009); and larger households demand more space and are unlikely to comply (Fekade 2000). The extent to which people are aware of the existence of standards can also impact on compliance. Low adherence can be attributed to weak enforcement mechanism, complex bureaucratic procedures, limited resources and unqualified staff (Payne & Majale, 2004; Goodfellow, 2013). Administrative practices such as culture and enforcement mechanisms are important for managing and controlling residential development.

Customary rights to land are administered by traditional authorities and rules are generally unwritten. This begs the question: how is land use planning (a responsibility of a government institution) organized, implemented and enforced in a customary tenure setting? The problem here is that zoning regulations impose rules and obligations for the good of the general public but the state does not own the lands needed to implement the plan. The obligation to comply may restrict and interfere with the freedom of customary authorities and landholders to enjoy their land rights.

While a lot of research has been conducted on the effect of land use and zoning regulations on urban form, house prices and pattern of development (Arimah & Adeagbo, 2000; Ayyoob, Yoshihiro, Kohei, Satoshi, & Akito, 2014; Baffour Awuah & Hammond, 2014; Burby, May, & Paterson, 1998), and on the benefits and factors affecting compliance with residential regulations in the context of formal Land Administration, (Alnsour & Meaton, 2009; Baffour Awuah, Hammond, Lamond, & Booth, 2014), little is known about the effects of zoning regulations on land right holders in the context of customary land tenure. This study intends to explore the implementation of zoning regulations in areas under customary land tenure system in Ghana. Results of this study have implications on the relevance of zoning regulations and standards in customary areas. For the purpose of simplicity, zoning regulations and residential standards are used interchangeably.
Three sub-objectives are pursued.

Sub-objective 1 aimed to find out the factors influencing compliance by addressing two issues: firstly, factors that motivate land right holders to implement residential standards (permitted land uses, maximum plot coverage, minimum plot size and types of buildings); and secondly, how enforcement influences land owners to implement the residential standards. Interviewees responded to questions on awareness of the standards, household sizes, income and how monitoring and enforcement influence compliance. Variables such as awareness of residential standards, socio-economic data (size of households, household income and education levels) can be used to answer factors that motivate landowners to comply with residential standards (Alnsour & Meaton, 2009). Enforcement was measured based on the frequency of visits by responsible team and sanctions or penalties given.

Sub-objective 2 focused on how zoning regulations affects the enjoyment of land rights by addressing two issues –i) perception of how the zoning standards interfere with the enjoyment of rights to land; and ii), how land right holders defend themselves against the prescribed zoning standards. Respondents were asked of how zoning regulations (permitted land uses, maximum plot coverages, minimum plot size; and types of buildings and standards) affect their freedom to enjoy their land rights. For sub-objectives 1 and 2, descriptive statistics were used to analyze the qualitative and quantitative data. Results are presented using frequency distribution tables and bar charts.

Lastly, sub-objective 3 focused on spatial analysis for assessing conformity and compliance of the selected plots using:

i) Local plan produced in 1990 and provided by Adenta Municipality in paper form
ii) Orthophoto produced from aerial images with a resolution of 0.2m. Produced in 2014 provided in *.tiff format from Survey and Mapping Division of Lands Commission.

Study Area

Accra is the capital city of Ghana. This city, though the smallest of all ten administrative regions in terms of area, is the second most populated (4,010,054 out of total of 24,658,823) accounting for 15.4% of the total population (GSS, 2010). It is the most densely populated with 1,236 persons per square meter. This is an indication of the excessive pressure on land and its related resources in this region. There is therefore an increasing demand for peri-urban lands as the cities get crowded (Arko-adjei, 2011). Developments are fast springing up in peri-urban area as people try to escape the frustrations in the city (traffic congestions, high rents, expensive land etc). This rush for peri-urban lands coupled with lack of development controls can result in various spatial problems. These problems include haphazard development that do not fully comply with residential standards, residential overcrowding, air and water pollution (Meaton & Alnsour, 2006).

The greater Accra region has been divided into 16 administrative districts which includes Adentan Municipality. According to Ghana Statistical Service, (2014), the urban and peri-urban areas of the Adentan Municipality have a higher proportion of houses (59.9%) as compared to the rural areas (40.1%). The Municipality have an average household size of 3.7. About 31.1% of households in the Municipality occupy separate houses and 30.7 percent of households occupy ‘compound’ houses. Improvised homes and uncompleted buildings provide dwellings for about a quarter of households in the Municipality, while Semi-detached houses and flat/apartment form a little over a tenth of all the dwelling units.

Ashiyie is a community in the Adentan Municipality in Accra, Ghana. Ashiyie is a fast developing peri-urban community with a population of about 4,200 (7th populous in the Municipality) with 561 houses and 1,082 households as at 2010. Demographics compose of low and medium income households. Ashiyie lands which cover a total area of 12,000 acres is under the Labadi Stool. The West Ashiyie neighborhood covers an area of about 500 acres and is the focus for this study(GSS, 2014). Lands are owned by the Odumanye Clan of Mnali We. The main inhabitants are the Ga-Damgbe’s while majority of the land use is residential. Majority of inhabitants engage in services, sales and craft related jobs according to the 2014 statistical report of Adenta Municipality. It is located 11.5km from Accra city thus most residents commute to the city to undertake daily activities. West Ashiyie is a peri-urban area whose local plan was developed in 1990 while Ashiyie West was bare land. This makes it one of the few areas in Accra to be planned ahead of development.

Allocation of rights to land and land ownership

Land rights are administered under customary tenure. Land is managed by family heads who hold freehold title (allodial interest) in land. The family heads are referred to as customary land authority or custodians/trustees of the land. Individuals (landholders) and estate developers who acquire lands from family heads have 99- year leasehold interest. Land right holders build their own houses – by hiring private developers. It is the responsibility of the land right holder to obtain a building permit from the planning authority at the Adentan Municipality.

Legal framework for Land use planning (zoning regulations) in Ghana

Until the passage of the Land Use and Spatial Planning Act (Act 925) in 2016, the Town and Country Planning Ordinance (1945) (Cap 84), was a legislation that proposed the use of master plans through functional land use, discreet zoning, regulation and consensus in the colonial era (Baffour Awuah & Hammond, 2014). It was supported by the Town and Country Planning Act, 1959; Town and Country Planning Regulations, 1959; the Local Government Act (Act 462), 1993; and the Building code (L.I. 1630), 1996. Local Government Act (Act 462), 1993, decentralized planning by making Metropolitan-Municipal-District Assemblies (MMDA's) planning authorities in their jurisdictions. The Adentan Municipality can therefore, prepare implement and enforce local plans. This implies that, although customary land authorities sell land to individuals, the preparation and approval of planning schemes, enforcement and sanctions are carried out by the government (MMDA's). The LI 1630 and the Zoning Guidelines and Building Regulation of Ghana, 2011 on the other hand regulates all physical development detailing the permit application process, permissible land uses, plot sizes, plot coverage and permissible type of building (detached, duplex, compound houses).
In other words, while customary authorities control access to land, management through planning comes from the District Assemblies. The mode of land alienation and tenure system can therefore have implications for planning. The Municipality consults with the customary land owners when creating local plans. The Municipality and customary land authorities together decide on the parcel sizes, which should be referred to when allocating the plots.

The main instrument for land use control in Ghana in recent times is the Land Use and Spatial Planning Act 2016 (Act 925). Act 925 consolidates and revises laws on land use and spatial planning in Ghana. Clause 113 of Act 925 prohibits a person from carrying out any development without a planning permit issued by the District Assembly.

Methods

Fieldwork took place in October 2015 in West Ashiyie. Face to face interviews were carried out with the occupiers of the plots (landholders). Key informants i.e. a Municipal Planner (responsible for physical planning); Engineer (responsible for monitoring and enforcement of zoning regulations and building standards); Assembly representative (represents residents'/land rights holders at the Municipality) and two customary authorities ('landlords', they allocate land rights to individuals) were also interviewed (see Table 1). The planner and the engineer provided information on the planning and permitting process, monitoring and enforcement of the regulations, challenges and limitations. The Assembly representative was interviewed on awareness program and challenges faced. Customary authorities were interviewed on their role in the implementation of the zoning regulations. These key informants were purposively selected as they are in a better position to discuss the zoning standards and enforcement, and programs for creating awareness. Below is a summary of respondents

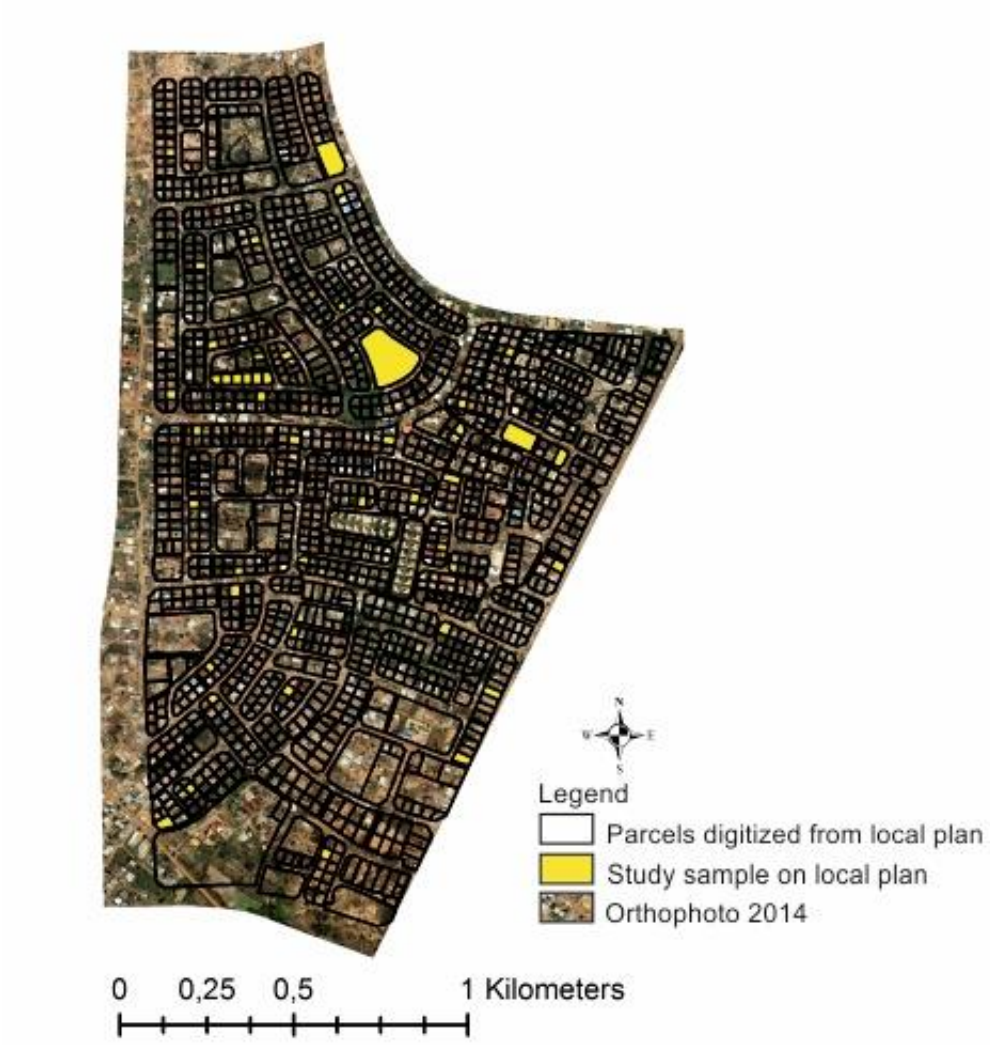

Figure 1: Study area and parcels selected for this study

Table 1. Interviews

Key informant	Role of key informant	Number interviewed
Municipal Planner	Physical planner	1
Works engineer	Monitoring and enforcement of regulations	1
Assemblywoman	Represents residents at the Municipality	1
Traditional Authority/custodians	The allodial owners of Ashiyie lands	2
Landholders	Those who have acquired land rights from the allodial owners of the land	44

The local plan was used to select the parcels – and therefore the households to be interviewed. Forty-four (44) parcels were identified using Bouchard's sampling formula as shown in the following equation.

$$Sample\ Size = \frac{\left(\frac{Z_\alpha}{2}\right)^2 \times P(1-P) \times N}{[(E^2) \times N] + \left[\left(\frac{Z_\alpha}{2}\right)^2 \times P(1-P)\right]} \quad (1)$$

$$Sample\ Size = \frac{1.96^2 \times 0.5^2 \times 1{,}376}{[0.15^2 \times 1{,}376] + [1.96^2 \times 0.5^2]} = 44$$

Where;
N = Total population size (1,376 for this study); this is the total number of parcels in the plan
P = The estimated frequency for the sample size N-Proportion of success (50% for this study);
E = Tolerable/margin error (15%); this is the amount of error one is willing to accept in the calculation.
Z_α/2 = value given to the confidence interval according to precision desired (1.96).

The households were selected regardless of social economic status of the occupants. According to Alnsour and Meaton (2009), land owners' income, educational level, household size and awareness of zoning and residential regulations can affect compliance. Prevalence of these factors may show willingness and intention to implement or not to implement regulations. Specifications for residential building standards and orthophoto from aerial images (from 2014) were used as a proxy to assess compliance with residential standards. Structured, face-to-face interviews were administered to land right holders and key informants. Land right holders responded to closed and open-ended questions while the key informants responded to open ended questions.

Local plan of West Ashiyie was scanned and georeferenced using Ground Control Points (GCPs) which were obtained with handheld eTrex Garmani GPS during the fieldwork. For accurate superimposition, all raster data was projected to the same coordinate system –WGD 84, UTM Zone 30 N. The boundaries of the plots were manually digitized over the raster local plan in ArcGIS. Plots that had been sampled for this study were digitized over the orthophoto. Fence walls and hedges were used as a guideline in digitizing parcels as they serve as parcel boundaries. Evaluating land use changes and level of conformity were done by overlaying vector data (extracted from the local plan) over the orthophoto. Visual interpretation was used to identify the conformity with the local plan. Spatial patterns can be explored using visualization in Geographical Information Systems (GIS).

Results

Factors influencing compliance with residential standards

Influence of awareness on implementation of residential standards

There is low public awareness of the residential standards. Of the 44 landholders, 14 are aware of the permitted land uses; 6 are aware of the maximum plot coverage; 10 are aware of the minimum plot size; and 11 are aware of the types of buildings and standards. Those aware of the residential standards obtained the information through the radio, neighbors, friends/spouses, and information sessions by the Municipality and experiences from other communities. None of the respondents has ever seen a zoning regulation document.

The Planner and the Assembly woman mentioned three methods used to convey residential standards to the citizens. First, the type of land use and plot sizes are indicated in the indenture

or deed (a written instrument that conveys interest in land by the customary authority). Family heads prepare the indenture. The lessee and lessor are the parties to the indenture with their corresponding witnesses. The customary authority indicates the land size, its location (via a 'site plan') and use in the indenture. Any discrepancies between the indenture and the land uses are to be checked by the Lands Commission before registering the document by requesting for planning comment from the TCPD. There is a gap here as some people build before registering their documents. Secondly, detailed information on the zoning standards are posted on the notice boards at the Assembly. This mode of communicating to use right holders is not effective thus creates uncertainty regarding residential standards. There is therefore high dependence on hear- say, which may not be true. This does not augur well for planning authorities considering the amount of money invested in preparing a physical plan. Thirdly, the Municipality creates awareness through its Residents Association Meetings. Meetings are organized monthly by the Assembly member and Unit Committee members (political representatives of the residents at the Assembly) to educate residents on the Assembly's developmental projects and other matters. According to the Assembly representative, participation is not compulsory hence rarely attended. Therefore, information from the Municipality is not well circulated. The planner indicates it is the responsibility of individuals to check the zoning status and standards before acquiring land. However, none of the landholders was aware of this process. Respondents however were aware that verification of the title document (search at Land Title Registry) prior to acquiring the land was important.

According to the planner, landholders are required to check the zoning status and standards of lands they want to acquire before going ahead to pay for land. However, none of the landholders interviewed was aware of this process thus acquire lands and build with no regards to zoning regulation and residential standards. The only process that is well known in the land acquisition process among respondents is verification of title document (search at Land Title Registry) before buying land. A situation the Planner blames on the Lands Commission inability to help educate people on the land acquisition process since planning regulation is also part of the land acquisition process and the first thing to be checked.

Dissemination of the zoning information has an impact on the levels of awareness, and consequently motivation to implement the zoning regulations. While the residential standards exist, results suggest they are distant from the people. Leaving the responsibility to seek the residential standards to the landholders may give the impression that the zoning regulations are optional for implementation. It is no wonder that just a few residents are aware of the zoning standards. As such, the landholders will pursue what is most important for them, i.e. the security of their land rights. This leads to the residents feeling more responsible to the customary land authorities –in paying ground rent, rather than the Municipality – to implement the zoning standards.

Influence of household size on compliance with the maximum plot coverage

More than half of the respondents breached on the plot coverage, according to Figure 2. Ignorance of plot coverage (never heard of it), building to rent (benefit from land) were given as reasons given for non-compliance with plot coverage. Respondents indicated using their own discretion to build on as much of the land as they wished while giving allowance for air circulation. Moreover, Figure 2 shows household size has direct negative impact on compliance with required maximum plot coverage. Respondents from a 3-5 household size fall within the accepted plot coverage of 60%-70%. Similarly, all small households of less than 3 built within the accepted coverage. However, plot coverage for large family sizes (households above 5) exceed the maximum plot coverage. This category of respondents indicated the need to shelter relatives compelled them to maximize available space on their compound. Household size can thus negatively motivate residents to comply with zoning

regulations as they increase shelter space to accommodate their large families.

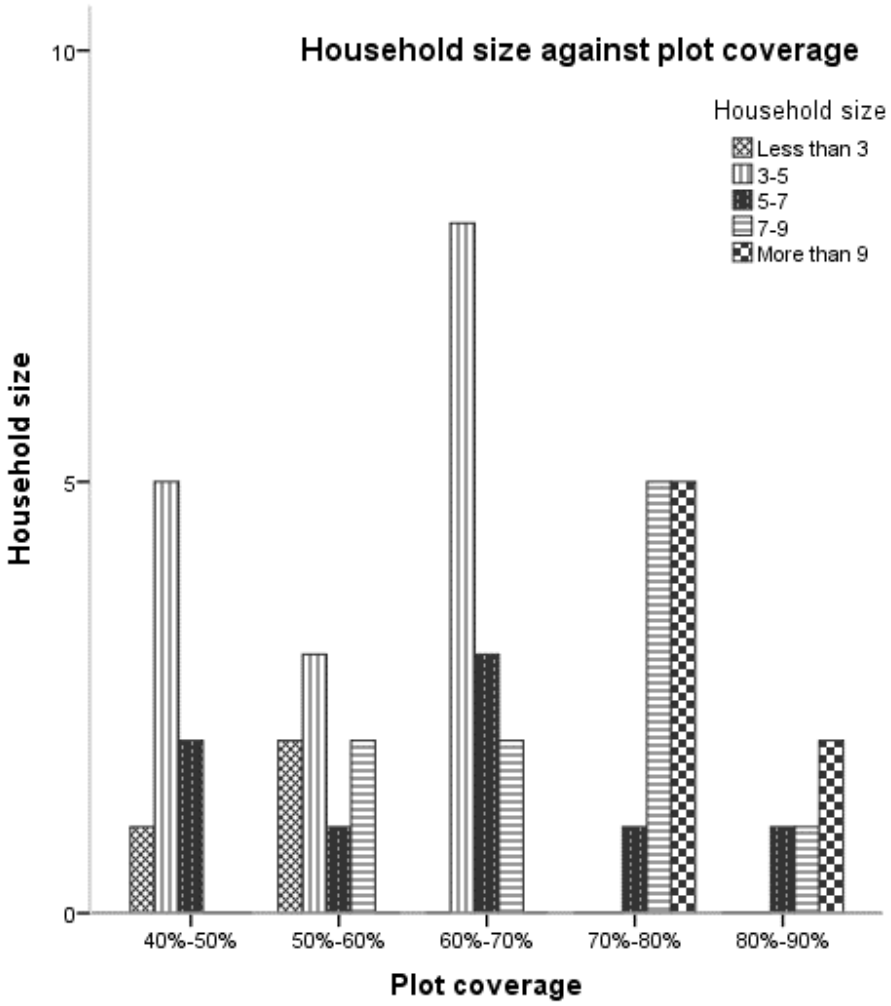

Figure 2: Household size and compliance with plot coverage (Source: Fieldwork, September 2015)

Influence of household income on compliance with the minimum plot size

There is compliance with the minimum plot size as all the plots conform to the stipulated minimum plot size of 350m^2 (Figure 3). Customary authorities thus allocate land in compliance with the minimum parcel sizes. Twenty-one (21) landholders who own more than 930 m^2 plots are in the GHS 500- GHS 1,000 income bracket. Pensioners aged above 60 years dominate this income group. Most purchased the plots with lump sum from their retirement benefits – in the 2000's, although they are currently earning between GHS500- GHS 1000. Others who currently earn below GH¢ 500 or GH¢ 500- GH¢ 1,000 have either inherited the land, received it as a gift or are indigenes. Furthermore, the arrangement of buying land when it's cheap and developing years later using the piecemeal method motivates all income groups to comply with plot sizes; otherwise they could not have afforded it now. Figure 3 thus suggests that income levels have little influence on parcel sizes.

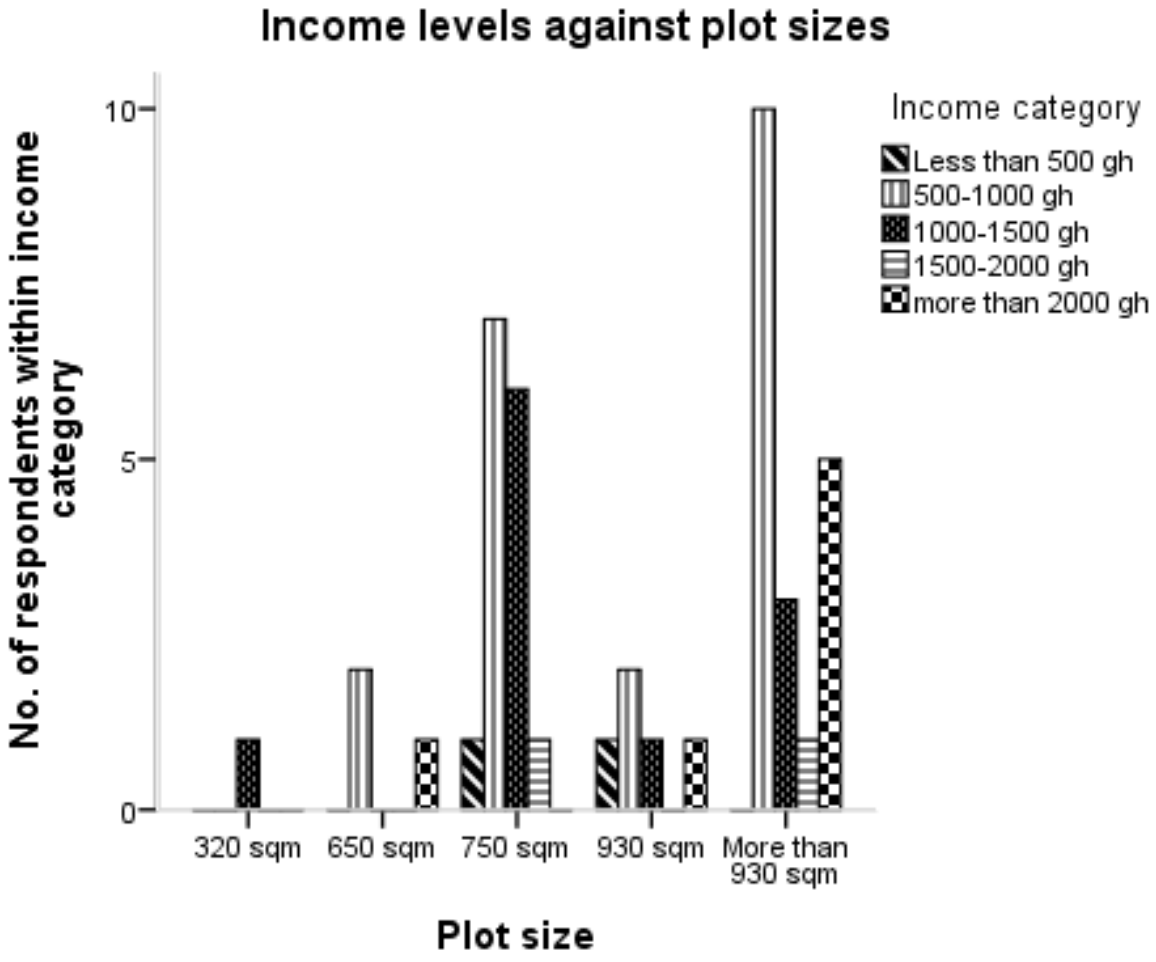

Figure 3: Income in relation to plot size (Source: Fieldwork, September 2015)

Two types of enforcement mechanisms exist: first, land right holders need to obtain a building permit (Local Government Act, 1993, Act 462). The permit process includes the verification of documents presented for a permit. A technical team which consist of the Planner, Works Engineer, Structural Engineers and representatives from Environmental Protection Agency and other departments inspect the application. Secondly, the Task Force Division of the Works Engineering Department monitors building sites to oversee that building permits have been acquired prior to erecting a building. Table 2 shows the stages of construction and type of penalties given if regulation standards are not adhered to. However, as noted by Kasanga and Kotey (2001), inadequate funding, inadequate skilled labour, mistrust between Assemblies and traditional authorities, friction between some established unit committees and traditional authorities affects the effectiveness of monitoring and enforcing regulations.

Table 2. Fines at each level of construction Adentan Municipal Assembly Fee Fixing Resolution, 2015

Stage of Construction	Single Storey		Multiple Storey Building	
	Fine (GH¢)	% Of Permit Fee	Fine (GH¢)	% of Permit Fee
Stage 1: Up to substructure	300	50 %	500	75
Stage 2: Up to first floor slab	-	-	600	Actual Permit Fee
Stage 3: First floor and above	-	-	700	1.5 of Permit Fees
Stage 4: Up to roofing	400	75%	-	-
Stage 5; Roofing and Finishing	500	Actual Permit Fee	1,000	Twice Permit Fees

Influence of monitoring and enforcement on implementation of residential standards

As shown in Table 3, majority (26) of landholders do not possess a building permit. Reasons for this include high cost, long process, lack of required documents, change of Municipality and the absence of task force. However, landholders possessed the indenture, which stipulates what the land is to be used for. The customary land authority confirmed this that while the indenture shows how the land should be used, they leave it to planning authorities to enforce the building standards. This suggests that enforcement of zoning regulation is strictly a government function.

Table 3. Number of respondents with building permits

Description	No of respondents	% of respondents
Yes	17	39
No	26	59
No answer	1	2
Total	44	100

Further, there is a low level of monitoring and enforcement of residential standards. Of the 44 respondents, 25 were never visited by the enforcement taskforce. According to the Planner and Works Engineer limited staff and logistics hinder the task force's ability to monitor and enforce the implementation. Hence, after issuance of building permit, the task force is unable to undertake the inspection visits as required due to logistical challenges and organization's limitations.

Nineteen respondents were visited by the monitoring and enforcement taskforce. Out of this number, 17 received penalty. The penalties are in the form of fines, written warnings and verbal warnings and in some cases seizure of construction tools -Figure 4. Penalties were issued because landholders began constructions without building permits. Three landholders were visited more than once.

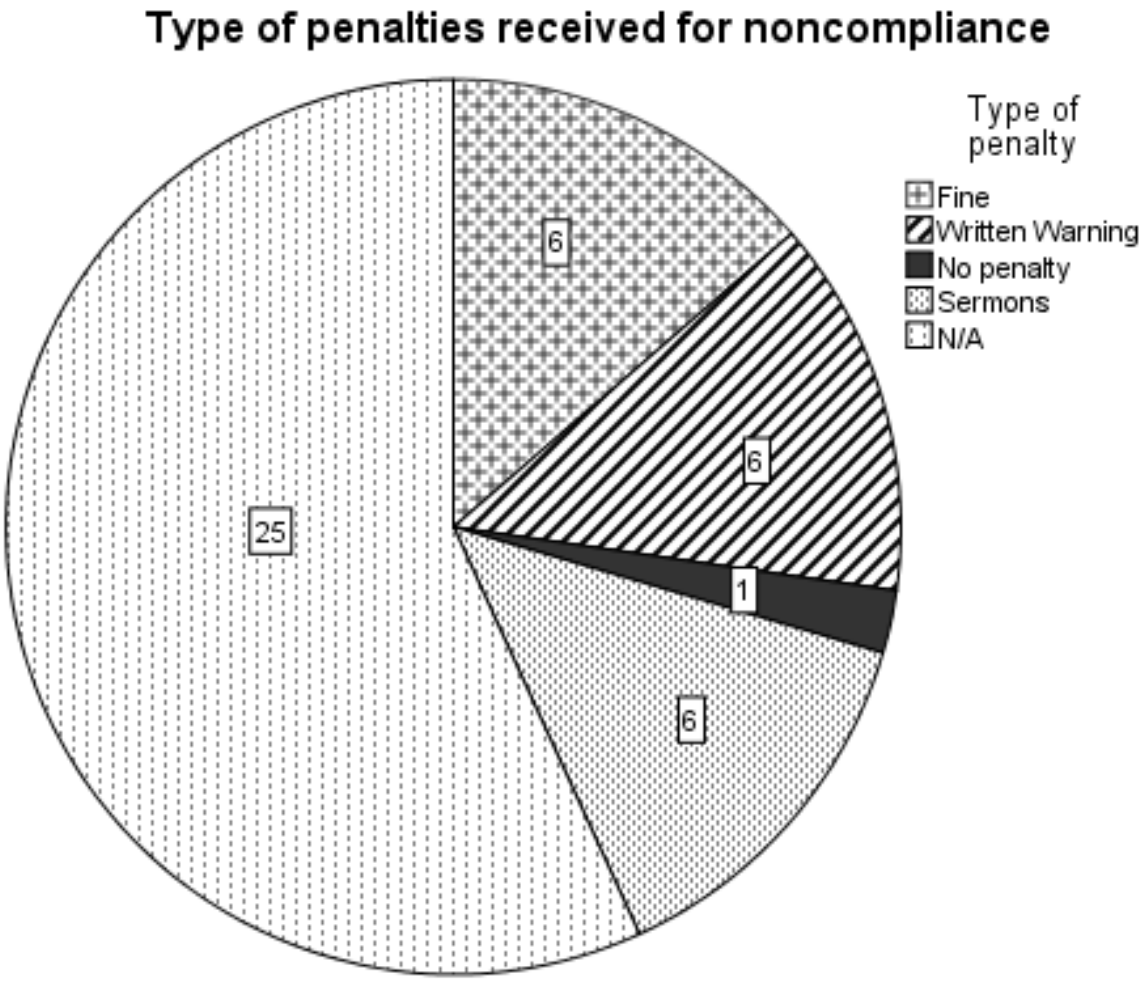

Figure 4: Types of penalties received for noncompliance (Source: Fieldwork, September 2015)

The penalties are light, according to the respondents. The planner indicates that harsher measures such as demolitions are limited to buildings blocking the right of way (road, utility) or waterway and not due to non-compliance. This suggests that land right holders may not be compelled to adhere to the residential standards even after receiving penalties. Moreover, respondents indicated that it is possible to regularize buildings at later stages. This has led to a practice of land right holders opting to regularize their buildings after receiving a penalty. This practice perhaps also encourages land right holders to flout on regulations.

Effects of zoning regulations on the enjoyment of land rights in the context of customary tenure.

Majority of respondents are confident of not losing their land rights due to non-compliance. Having obtained their *land* rights from the customary authorities, landholders believe the planning authority can only fine for non-compliance. Further, by registering their land rights (getting land title certificate from Lands Commission) respondents strengthen their land rights and security of tenure. According to the landholders, tenure insecurity can result from a lack of the title certificate and not from non-compliance. Thus, non-compliance to residential

standards has minimal interference on enjoyment of land rights.

How land right holders defend themselves against the prescribed residential standards

Landholders do not resist the residential standards perhaps due to lack of awareness and low enforcement by the planning authority. One landholder indicated taking legal action against the Municipality. Written false warnings on buildings have also been used as a mechanism by developers to prevent task force from visiting property. These false warnings e.g. 'stop work' notice gives the task force the perception that they have already visited the said property thereby evading penalties. Landholders (5) have also bribed the task force to avoid penalties.

Spatial analysis to assess conformity and compliance with the local plan

This section assesses conformity between reality of land uses and parcel sizes (derived from orthophoto from 2014) and the local plan. By overlaying the vector data extracted from the local plan over the orthophoto visual interpretation was performed to derive any changes. Figure 4 shows the general differences upon overlaying the vector data from the local plan and the orthophoto. On Figure 5, spatial compliance is visible concerning. i) Permitted uses i.e. residential area and ii) minimum plot size. However, four main types of spatial non-conformity between the local plan and orthophoto are identified:

i) Orientation of the parcel boundaries
ii) Shapes of plot boundaries
iii) Plot sizes
iv) Houses constructed on the border, or straddle parcel boundaries.

Differences in the orientation of parcel boundaries

A size reduced version of the images is used to present the results. Thus, a few of the 44 plots sampled for this study are used to elaborate on the changes observed between the orthophoto and the vector data extracted from the local plan. Figure 6 shows changes in the parcel boundaries as observed from the orthophoto and the local plan. Parcel 44 in Figure 6 shows a spatial misalignment between the local plan and as appears on the orthophoto by a whole right angle.

Changes in shape of parcels

Figure 6 also reveals the differences between parcel shapes on the local plan and on the orthophoto. All parcels sampled for this study do not spatially conform to the local plan. Figure 6 shows a few examples. Parcel 43, for example, suggests that according to the local plan, one plot exists on that space. However, the orthophoto shows that the plot has perhaps been subdivided into smaller plots. Boundaries of parcels adjustment to plot 43 also show discrepancies on the intended shapes of the plots compared to the orthophoto.

According to the family head, the proportion of family heads with maps/layout of the extent of their ownership is unknown. The family head interviewed added that customary authorities receive the layouts from the Municipality. However, they often allocate parcels based on their own discretion of where they think the boundary with the local plan layout lies. This may lead to a deviation on the parcels boundaries in reality and parcels depicted on the local plan. The Municipality may find it difficult to monitor spatial non-conformity especially when residents fail to obtain permits building permits for their plots. Further, the differences remain undetected as the zoning enforcement team rarely monitors this.

Figure 5: Changes in orientation, shapes, and sizes of plots

Change in Plot sizes

All plots conform to or are above the minimum parcel size. Areas (in size) are above the minimum standard (350m^2). Differences between the orthophoto and local plan suggest that changes in the plot sized have taken place. All parcels sampled for this study in Figure 6 confirm this. Changes in plot sizes result from subdivisions e.g. in parcel 3 or merging of plots e.g. on 43. According to the Municipal Planner, most of the subdivisions and merges are undertaken without approval from the Municipality. The Municipality finds this problematic as it defeats the purpose of the plan. Also, there is no restriction on how many parcels one can own as customary landowners are interested in receiving rent from the land. This situation further suggests that land right holders not affected by zoning standards as they can opt to subdivide or merge parcels by consulting customary authority instead of the Municipality.

Building outside plot boundaries

Figure 5 also reveals that buildings have been constructed outside the designated parcel/plot boundaries on the local plan. Buildings touch, across the boundary by the local plan, or are constructed on road reserves. Visual interpretation suggests live or other types of fences represent legitimate boundaries in use, indicating that the local plan has been thrown overboard. The planning authorities are aware of this problem. The Planner believes that there is about 50% compliance with residential standards; and about 30% conformity with parcel boundaries and planning with the local plan. The Planner believes that the spatial non-conformity is due to lack of corporation between custodians of land, Lands Commission and planners, lack of technical staff to monitor compliance and conformity, land litigations and the many number of family heads selling/leasing land. Planners have little influence where land is held under customary tenure as the allocation of land in reality differs from the local plan.

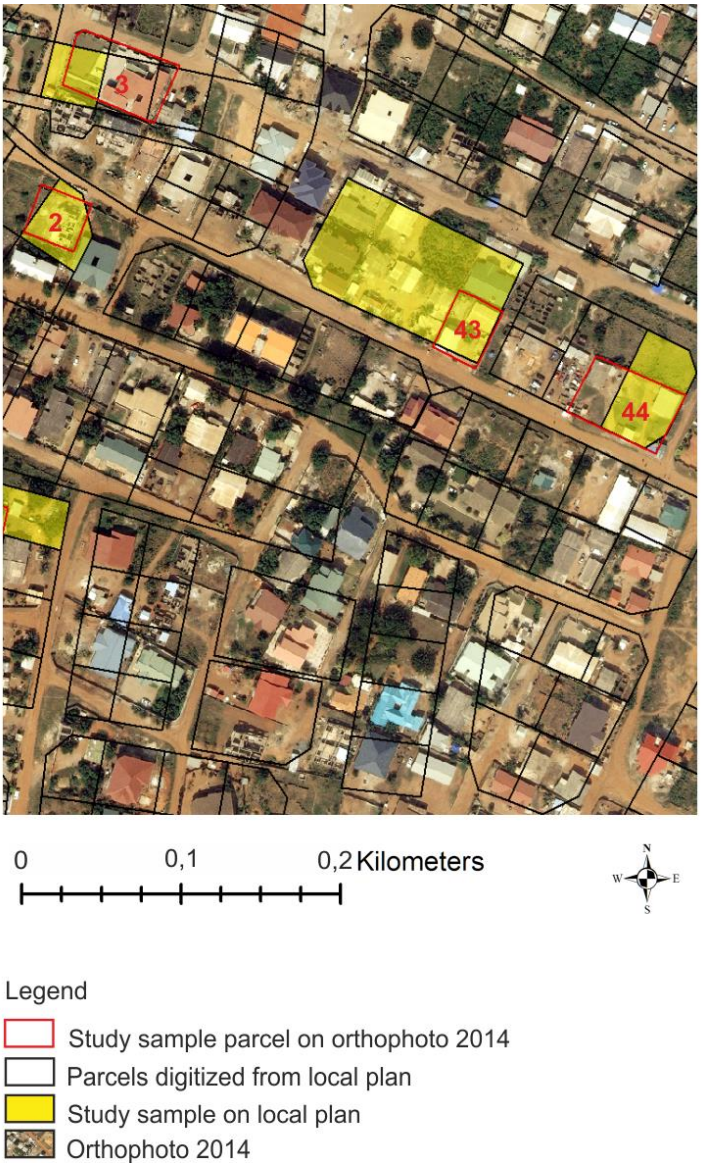

Figure 6: Differences between digitized data from local plan and Orthophoto 2014

Discussion

Factors influencing compliance

The study found out that lack of awareness of the zoning standards contribute to the non-compliance by land right holders. This study confirms Fuseini & Kemp, (2015) assertion that there is dearth of interaction between the multiple institutions dealing with land i.e. the customary land owners (on allocation of land rights), the Land Commission (on issuing title certificates) and Municipality (on issuing building permits). Lack of interaction between the multiple institutions dealing with land i.e. the customary land owners (on allocation of land rights), the Land Commission (on issuing title certificates) and Municipality (on issuing building permits) also contribute to the lack of awareness. Lack of awareness of the standards, household size, and need to generate income through rent contribute to non-compliance with the maximum plot coverage. Respondents of this study did not have clear procedure on where to get the information on the building standards. Lack of communication between the different authorities' means citizens are uninformed of what processes to follow and from which institution. Where opportunities were available e.g. through the Assembly representative, participation to the monthly meetings is optional. A synchronized procedure with the multiple institutions is perhaps needed to communicate the zoning standards, and emphasize its relevance. This confirms that the government and customary institutions do not work well together because their systems are not synchronized Fekade (2000). This study also shows that when citizens encounter with different institutions for different purposes, they learn to assert which institution is most relevant or poses most consequences to them. In this study, citizens revere customary authority (to access land rights) and the Lands Commission (to secure their tenure through a title certificate), and pay little attention to planning authority (on building standards). As noted by Boamah et al., (2012), planning authorities have to look for new ways to engage the public to participate in land use planning and enforcement of zoning regulations. There is the need to intensify and strengthen awareness through community programs and sensitization session.

Meanwhile, larger households call for more space. Demand for rental houses tempt land right holders to intentionally or unintentionally breach the maximum plot coverage. This result confirms Tipple's (2000) assertion that household size can negatively motivate use right holders to comply with standards such as maximum plot coverage. Low income also play a role in compliance with the plot coverage. The role of low income in compliance is twofold. Firstly, low income can serve as motivation for respondents to expand their houses or utilize their compound to earn income through rents thus exceeding maximum requirements and secondly, the costs of obtaining a building permit are often unaffordable by the low income earners, and the building standards may be burdensome, and this can negatively influence compliance (Dowall & Clarke, 1996; Fekade, 2000).

Findings show that enforcement has a positive influence on compliance with zoning regulation. Respondents who were visited by task force to check land use and compliance complied by getting permit to use land appropriately (Arimah & Adeagbo, 2000). The approach used by the Municipality is detecting violations and having them corrected. This is the only way as prevailing conditions in the study area such as multiple sale of land, land disputes, increasing demand for land and increment in land values do not allow use right holders to voluntary get permission to use land. Aspects of enforcement capacity such as staffing, technical expertise has an impact on compliance. Limitations in technical knowhow and number of staff, inadequate logistics makes it difficult for construction sites to be monitored at all stages of construction. It reduces the frequency of inspection carried out on ongoing construction works. There is therefore the need to increase capacity by adding better trained

personal not to only detect buildings without permit, properly review building plans for compliance with standards, but also inspection of construction with approved plans and detecting changes to approved plans.

To be able to properly enforce regulation, emphasis should be placed on equipping personnel to be able to detect violations and development without permit (Addai Boamah et al., 2012; Boamah, 2013; Fuseini & Kemp, 2015; Kuusaana & Eledi, 2015).

In this study the land right holders barely obtain a permit voluntarily because the process is circuitous, time-consuming and expensive. Logistical challenges affect monitoring and enforcement activities by the Municipality. This situation contributes to non-compliance as it creates conditions under which residents can violate zoning regulations (Burby et al. 1998). Burby adds that planners need to either improve their staff base and resources to detect or correct violations or create conditions under which violations are unlikely to occur. This study shows that the problem of non-compliance is exacerbated in the context of customary land tenure, where the customary land owners are concerned about earning rent rather than implementation of the zoning standards. Rukwaro (2009) observes that where enforcement by the planning authority is ineffective land owners can contravene the regulations with impunity. This also shows in this study.

Effects on land rights

Land right holders in a customary tenure setting do not risk losing their land rights due to non-compliance. In this study, respondents view their financial commitment to pay ground rent to the customary land owner and obtaining a title certificate from the Lands Commission is much more important. While building permits and zoning standards – (by the Municipality/planning authority) may be costly and cumbersome to obtain/implement, residents do not protest against this. Rather, residents have learnt trick to evade the prescribed zoning standards. Residents take advantage of the weak enforcement and light penalties by the planning authority and opt to regularize their buildings through a different permit – only after receiving a penalty from the planning authority. Regularization of buildings after completion implies that the planning authorities tolerate deviation from the zoning standards. Tanasesc et al (2010) observes the same in the context of formal land administration, where buildings deviant to the zoning regulations are considered illegal become accommodated in the mainstream policies. Toleration of deviation from the zoning standards happens when the government takes initiative to shift their policies and device approaches to regulate, rather than to demolish illegal structures or buildings not compliant to the zoning standards Tanasesc et al, (2010). As such, where property deviant to zoning regulations become accommodated in the mainstream policies, then the zoning standards have no effect on land right holders enjoying their land rights. However, there are cases where zoning regulation affects the land rights through evictions therefore loss of tenure security and consequently the loss of livelihoods as well (UN Habitat, 2008),

Spatial conformity

Land use planning is being spear-headed by customary land owners instead of the Town and Country planning department (Kuusaana & Eledi, 2015). The customary landowners and not the government take the decision as to which areas should be rezoned and subdivided or merged. This contradicts the Local Government Act 1993 (Act 462). This study notes the lack of cooperation between Municipality – planners and customary land owners. This does not only lead to unawareness of the required building standards by the residents, but ripples out to the spatial incompatibility between reality and the local plan. A total disregard of the plans by the customary authority and residents has left the planning authority being the only one concerned with the implementation of the building standards. Coupled with the inefficiencies

in monitoring and enforcement by the planning authority, results are dramatic deviations between the real world and local plans – as revealed in this study. Deviations range from contrasts in the orientation of the parcel boundaries; in the shapes of plot boundaries; houses constructed on the border, or straddle of parcel boundaries and differences in the plot sizes. However, compliance with residential standards is high, perhaps due to the area's proximity to the city of Accra and demand for residential houses. Studies show that zoning standards are challenging to implement in customary areas due to multiple interests held in the same land by different people – especially in the rural areas; and that the existing land tenure system in an area can affect how the zoning standards are received as planning institutions can find themselves being at the mercy of customary land owners to get a local plan effectively implemented (Yeboah & Obeng-Odoom, 2010).

This study suggests the need for the planning authority to find ways to improve efficiency and effectiveness on monitoring and enforcement of building regulations. The spatial analysis this study has proven the relevance of (GIS) for monitoring deviations with the local plan. GIS has become a significant tool to effectively monitor the zoning standards in the recent years (Talen, 1996). Unmanned Aerial Vehicles (UAVs) can help inspect/monitor properties and support the enforcement process quicker and cheaply. Application of such Geo-information tools and technologies in monitoring and enforcement can counteract logistical challenges associated with field patrols.

Conclusion

This study assessed compliance of residential standards and if these have any effects on the enjoyment of land rights in the context of customary land tenure in Ghana. Results indicate that the planning authority does tolerate the deviations from the building standards by permitting completed buildings under a different permit. This suggests that certain regulations and standards are not capable of fulfilling their purpose in the face of challenges. The results have significance to land use planners. Much time and resources are put in to developing the local plans and defining regulations standards and enforcement mechanisms. These efforts are in vain when field visits are the main methods for monitoring and enforcing the zoning standards. This is worsened where logistical challenges hinder monitoring and enforcement activities. Changes observed by superimposing of the local plans of 2010 over the orthophotos of 2014 do not only illustrate waste of planner's time and money spent on preparing plans but also defeats the purpose of the plan and the aims. Unimplemented plans and standards also leads to loss of benefit to the general public. Ensuring conformity with plot boundaries calls for coordination between the planning authority and the customary authorities. In this study, synchronization of procedures and cooperation between responsible authorities i.e. the Municipality, customary authority and Lands Commission may help increase awareness and enhance implementation of the zoning standards. Further, tools like GIS, and lately using affordable acquisition techniques such as UAVs can enhance efficiency in monitoring and implementation of the zoning standards and address logistical challenges associated with field visits. There is therefore the need for frequent post-plan evaluation to avoid repetition of flaws. If this is not done, it may appear that non-conformity and non-compliance are acceptable to governments and not important to warrant strict enforcement.

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