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Spatio-temporal dynamics and livelihoods transformation in Wa, Ghana

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ABSTRACT

This paper examines how indigenous peri-urban households in Wa, one of the fastest growing towns in Ghana are adapting to the effects of physical transformation of their environment. By analysing Landsat satellite images and using social research methods, the paper discusses the nature and extent of urban growth, its impact on peri-urban livelihoods, and the coping strategies of peri-urban households. Findings show that urban land in Wa increased by 5.73 times—from 5.75 km^2 in 1986 to 32.93 km^2 in 2016 with an annual growth rate of 5.9%. This growth led to the conversion of agricultural lands into residential and other uses. As a result, many indigenous peri-urban households are abandoning agriculture in search for urban-based employment as a safety net. The study recommends partnership between local government and landowners to identify and protect high potential agricultural lands in Wa; modernisation of the land governance and management processes in view of the loss of cultural and spiritual values associated with land; prioritisation of physical and spatial planning at the district level; and equipping indigenous peri-urban households with skills to assist them create sustainable livelihoods to compensate for the loss of their agriculture lands.

1. Introduction

Urban areas are undergoing dramatic changes in their physical, social and cultural systems as a result of rapid population growth (Cohen, 2006). Ichimura (2003) and Roy (2005) for example observed that urbanisation was dominant not only in developing regions but in the entire world. Africa's urbanisation rate is described as the fastest in the entire world and the projections are that by the year 2030, over half of the African population will be living in urban areas (Cohen, 2006: Ichimura, 2003). Although this position is contested (see Obeng-Odoom, 2010; Potts, 2009, 2012), Ghana as a developing African country has already achieved this milestone in 2010 with over half of its population living in urban settlements (Ghana Statistical Service (GSS), 2012).

Although urbanisation is an evolving concept (Frey and Zimmer, 2001), with its meaning varying through time and the context within which it is used, it generally, refers to an increase in the proportion of people living in urban centers or cities (Firebaugh, 1984). The population increase in urban centers could be either through rural to urban migration or natural population increase. An *urban center* is a term that is used to refer to a place based on several factors such as population size, population density, economic and social organisation, administration, etc. (Frey and Zimmer, 2001). For practical purposes, some countries adopt a few of these factors as criteria to define an urban center, with population being the most common (Oduro, 2010, p. 13). For instance, in Ghana a settlement with a population of 5000 or more is urban while the corresponding cut-offs in Denmark and the United States are 250 and 2500 people respectively (Zeigler et al., 2003).

A notable feature of rapid urbanisation particularly in developing countries is the growth, transformation and outward expansion of cities into their fringes and the creation of a morphology that is hardly envisaged during the planning stage. The peri-urban (sometimes also called the urban fringe) is predicted to become the dominant urban form and spatial planning challenge of the twenty-first century (Ravetz et al., 2013). By transforming pastoral farmland into often-unattractive suburbs, peri-urbanisation is thought to interrupt a natural balance between urban and non-urban land uses, leading to a deplorable degradation of the landscape (Brueckner and Fansler, 1983).

In Sub-Saharan Africa (SSA), agriculture employs more than half of the total labour force (IMF, 2012) and within the rural population, provides a livelihood for multitudes of small-scale producers. Smallholder farms constitute approximately 80% of all farms in SSA and employ about 175 million people directly (Alliance for a Green Revolution in Africa, 2014). In Ghana, employment in agriculture is 42% of total employment as at the year 2010 (World Bank, 2017). However, it is predicted that large scale acquisition and conversion of peri-urban land into non-agricultural uses could have far-reaching consequences for farm-based livelihoods sustainability, global poverty reduction goals,

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eradication of hunger and improving food security, particularly in Africa (Cotula, 2012; Margulis et al., 2013; OECD, 2016).

Although there is rising scholarship on peri-urbanisation and its impacts, much of the previous works focused on the spatial, economic dimensions and drivers of peri-urbanisation (e.g. Appiah et al., 2014; Brueckner and Fansler, 1983; Carmody and Taylor, 2016; Cobbinah and Amoako, 2012; Cotula, 2012; Ravetz et al., 2013). Much is not known about the impact of peri-urbanisation on the socio-cultural dynamics (e.g., livelihoods transformation) of host or recipient communities. We know little about the impacts of peri-urbanisation—leading to loss of farm lands and displacement, on agrarian livelihoods, and how communities adapt and crucially transform in response to this phenomenon, in rapidly growing cities and towns.

Given the crucial role of agriculture in confronting the challenge of eradicating hunger and improving food security in SSA (OECD, 2016), this paper examines livelihoods transformation within the context of urban growth and expansion. Using Wa, a fast urbanising Ghanaian town, as case study, this paper examines urban expansion and its linkage with peri-urban households' livelihoods transformation and coping strategies. Primarily, by analysing Landsat satellite imagery data through the application of Remote Sensing in Geographic Information System (GIS) and using spatial metrics, we examined urban expansion dynamics for the period (1986–2016) in the study area, and how this impacts households' livelihoods. The remaining sections of the paper are structured as follows: Section 2 presents literature review on the concept of peri-urbanisation, its drivers, socio-economic impacts and spatial patterns of urban land expansion; Section 3 describes the research setting and methods used; Section 4 presents the analysis and discussion. The paper concludes with some recommendations to improve the adaptive capacity of peri-urban households in Ghana, and other developing countries in Section 5.

2. Urban expansion dynamics and peri-urban livelihoods

2.1. Drivers of peri-urbanisation

Peri-urban areas due to their strategic locations and multifunctional territorial nature have and continue to experience incessant push and pull tendencies from neighboring cities and rural areas (Ravetz et al., 2013). As a result, different groups of people with diverse interests are attracted to such areas (Rauws and van Dijk, 2013).

Mancebo (2008) identified three main drivers of peri-urbanisation: residential choice, choice of location for certain activities, and planning biases. These drivers are expedited by the low land prices and legal flexibility in land use planning in the rural-urban fringe coupled with high rents at the core of the cities (Hudalah et al., 2007). According to Mancebo (2008) the hedonistic aspect of the outskirt: safer, calmer, better schools, closer to "nature", "small town" atmosphere makes people opt for such areas for housing. The growing urban population (Acheampong and Anokye, 2013; Cobbinah and Amoako, 2012), the deteriorating housing conditions and inadequate urban services (Cobbinah et al., 2015a, 2015b) further drives the process. Other urban researchers (Cobbinah et al., 2015c; Kuusaana and Eledi, 2015) in their studies found that the preference for the peri-urban areas for settlement and other commercial pursuits is motivated by the relatively affordable lands in those areas in comparison to the main city and big towns (see also Acheampong and Anokye, 2013; Oduro et al., 2015).

Webster (2002) on the other hand emphasizes the economic rationality of peri-urban land owners as the key driver of peri-urbanization. According to him as result of higher economic gains from conversion and transformation to other land uses other than agriculture, land owners would opt for other activities with higher future earning returns on their land, against agriculture (Irwin and Geoghegan, 2001). This incentive makes some customary landholders to alter the available land use plans in order to create non-existent 'sellable' spaces for urban infrastructure (see Yeboah and Shaw, 2013). This situation if unmanaged will have dire consequences on peri-urban agriculture and sustainability of peri-urban livelihoods thereof (Kuusaana and Eledi, 2015). According to Kuusaana and Eledi (2015) efforts of governments to make cities self-sustaining in terms of producing their own local food will remain a mirage if there is no productive land available as land remains a major constraint to advancing urban and peri-urban agriculture even when all the other factors including transportation, markets, extension services and capital are resolved.

Lack of enforcement of land use plans, growth boundaries, and development control in many cities in developing countries is another cause of peri-urbanisation. Although urban growth management strategies may not be a guarantee to contain urban growth (Fertner et al., 2016), such strategies have yielded results in some instances (Phillips, 2015). In particular, development control is necessary to guarantee fair allocation of scarce resources more effectively particularly among competing uses and users (Chabot and Duhaime, 1998). For instance, due to higher economic gains, developers tend to convert and transform agriculture land uses to other uses (eg commercial and residential), which are perceived to have higher returns (Irwin and Geoghegan, 2001; Webster, 2002). Furthermore, without adequate enforcement of land use plans, green areas, vegetation and habitat protection may not be adequately catered for by actions of individual landowners (Jaeger, 2006). Despite the numerous positives of adhering to land use plans in urban development in various contexts, land use plans are usually not adhered to by many developers in cities across Ghana (see Boamah et al., 2012; Ahmed and Dinye, 2011; Yeboah and Shaw, 2013). This situation is often blamed on lack of institutional capacities, political interference and attitudes of residents towards development control (Boamah et al., 2012; Cobbinah and Korah, 2016). As a consequence, many Ghanaian cities experience haphazard physical developments, including the encroachment of green areas and conversion of prime peri-urban lands into non-agricultural uses.

2.2. Spatial patterns and dynamic mechanisms of urban land expansion

Urban expansion could generally be categorised into the three interlinked processes of infilling, expanding, and outlying (Wilson et al., 2003). Infilling results in relatively compact and consolidated physical development. In most cities in developing countries, however, rapid peri-urbanisation, characterised by unconsolidated lateral physical expansion and sprawl, has resulted in existing built-up areas engulfing smaller towns on their peripheries (Cobbinah and Amoako, 2012; Kombe, 2005; Webster, 2002). As contemporary form of urbanisation, the uncontrolled expansion of urban centres into their peripheries has been driven by the need for housing to meet the demands of rapid population growth and the attendant space requirements of various socio-economic activities often at the expense of Greenfield land (Acheampong and Anokye, 2013; Appiah et al., 2014).

Previously, many papers have analysed the spatial patterns and dynamic mechanisms of urban land expansion in some cities and metropolitan regions in Ghana, such as Greater Kumasi Metropolitan Area (Acheampong et al., 2017), Kumasi (e.g. Amoateng et al., 2013; Cobbinah and Amoako, 2012) and Tamale (Kuusaana and Eledi, 2015). The only study on urban expansion dynamics in the study area is by Aduah and Aabeyir (2012). This study though useful, only focused on Wa Municipal (macro level) without insights on urban land expansion within Wa Township (micro level). Furthermore, the pace of spatio-temporal changes and growth in many cities in Ghana means that much of the findings in previous studies often become outdated and cannot be relied on for accurate analysis of urban expansion. In addition, as urbanisation and globalisation/economic activities accelerate, the spatio-temporal patterns of urban land expansion in cities as well as the impacts on agrarian and peri-urban livelihoods of such expansion have become important research emphases globally (e.g. Cotula, 2012; Margulis et al., 2013; Ravetz et al., 2013). Several studies have attempted to identify and quantify the pace, amount and intensity of