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Wetland gentrification in African cities: Implications for sustainable property development

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Abstract

There is growing scholarly interest in notions of green gentrification in the global North, which explores how environmental improvement in gentrifying districts drives up real estate prices and subsequent displacement of low-income residents. Although similar processes of increasing demand for property development and its attendant displacement of urban wetlands is occurring in African cities, previous research have simply conceptualized it as wetland encroachment and not as a form of gentrification. The objective of this article is to re-conceptualize the dynamics of wetland encroachment in African cities within the broader conception of gentrification and analyze its implication for sustainable property development. Drawing on insights from extant literature on African urbanism, wetland encroachment and gentrification, we term the African variant of green gentrification as ‘wetland gentrification’. Wetland gentrification occurs when customary authorities, amid land scarcity and rising property values, alienate wetlands in urban neighbourhoods. Property development practices, typically by high-income earners and private developers, on urban wetlands lead to the displacement of the ecological resources and subsequently poor households and settlements through urban flooding. We frame wetland gentrification as tantamount to unsustainable property development because it deteriorates water quality and ecological lives, causes urban flooding, and deepens urban poverty.

Key words: Urban Wetlands; Wetland Gentrification; Green Gentrification; Sustainable Property Development; African Cities

Introduction

Wetlands are globally described as a type of ecological structure epitomized by permanently or temporarily waterlogged grasslands, bogs, swamps, papyrus, marsh, grassy fens and fertile floodplains (Kakuba & Kanyamurwa, 2021). It is argued that ‘wetlands play an irreplaceable role in regulating the global climate, maintaining the global hydrological cycle, protecting the ecosystem diversity and safeguarding human welfare’ (Xu et al., 2019, p. 1). The multiple benefits and services provided by wetlands are essential in achieving most, if not all, of the Sustainable Development Goals (SDGs) (Kakuba & Kanyamurwa, 2021; Ramsar Convention on Wetlands, 2018). In recognition of the numerous benefits and services wetlands provide to communities and their residents, they have been described as ‘kidneys of the landscape’ (Hassan et al., 2014), ‘jewels’ (Gardner et al., 2009) and as ‘prized land’ (Ramsar, 2018). Notwithstanding the benefits, the narrative of ‘wetlands under threat’ has dominated the global discourse on wetlands, over the last four decades (Dixon et al., 2021). Global losses of wetlands are at least 87 percent and 64 percent since 1700 and 1900 respectively (Davidson, 2014). The highest rate of loss are in locations and regions where development pressures are most intense (Wetlands International, 2015). In terms of location, the threat against wetlands is an ‘urban’ phenomenon than it is rural (Dar et al., 2020;

Isunju & Kemp, 2016; Kuusaana et al., 2021). Regionally, the threat is more devastating in the fast expanding cities of the Global South and particularly Africa, where unprecedented wetland depletion is leading to recurring environmental disasters (Campion, 2012; Hettiarachchi et al., 2015; Isunju & Kemp, 2016). In many African cities, there is evidence of massive transformation of urban wetlands – through drainage, landfilling, channeling of streams and construction of barriers and retaining walls – into land for property development (Andreasen, Agergaard, Kofi, et al., 2022; Asumadu et al., 2023; Isunju & Kemp, 2016; Munshifwa et al., 2021).

A review of extant literature reveals that encroachment of wetlands and other forms of urban greenery is a common characteristic of the urbanization processes in most cities in the global South and particularly African cities (Alabi, 2022; Azagew & Worku, 2020; Cobbinah & Darkwah, 2016; Isunju & Kemp, 2016). These studies suggest that a considerable number of the urban wetlands in African cities that are targeted for development are usually located in built-up areas with high property values (Andreasen, Agergaard, Kofi, et al., 2022; Asumadu et al., 2023; Kuusaana et al., 2021). The sale of urban wetlands by traditional authorities is influenced by economic calculation of releasing the latent value of marginal or idle land (Andreasen, Agergaard, Allotey, et al., 2022; Kidido & Biitir, 2022). Some scholars have indicated that, due to the magnitude and cost of engineering works required to convert wetlands into building lands, permits to develop wetlands are usually given to high-income groups and commercial high bidders (Kuusaana et al., 2021; Munshifwa et al., 2021). Having regard to these insights, we contend that the dynamics of urbanization, wetland encroachment and displacement in African cities is synonymous with the general characteristics of green gentrification in Western cities, which includes urban green spaces, increases in real estate prices, involvement of rich and powerful actors, the rent gap and displacement of vulnerable populations (Anguelovski et al., 2019; Rigolon & Collins, 2023). Interestingly, this relationship has eluded many of the scholars whose research borders on wetland encroachment and green gentrification. Therefore, the phenomena of wetlands encroachment (Andreasen, Agergaard, Kofi, et al., 2022; Isunju & Kemp, 2016; Kuusaana et al., 2021) and green gentrification (Anguelovski et al., 2019; Blok, 2020) are usually researched separately, with little or no linkage.

This article introduces the concept of wetland gentrification to broaden our understanding of the processes of urbanization, urban development, and displacement in African cities. Drawing on relevant and related literature, we unpack wetland gentrification and its implication for sustainable real estate development. Wetland gentrification occurs when customary authorities alienate wetlands – amid land scarcity and rising property values – in urban neighbourhoods to middle and high-income groups and large-scale real estate developers. Those who purchase urban wetlands engage in property development practices that displace, first, the ecological ecosystem, and subsequently, low-income households. The concept of wetland gentrification draws on and amplifies the theoretical framing of African urbanism, urban greenery encroachment and green gentrification. Even though a considerable amount of research has been conducted on these concepts separately, wetland gentrification holds promise to illuminate the intersection between them in the context of African cities. We conceive wetland gentrification and green gentrification as related but opposite concepts. While the latter has to do with increases in green amenities and its associated displacement of vulnerable human populations, the former focuses on the loss of

green infrastructure (specifically wetlands) and how development practices displace both vital ecological ecosystem and poor people. We frame wetland gentrification as tantamount to unsustainable property development because it relates to development of properties that, among others, deteriorates water quality and ecological lives, causes urban flooding, and deepens urban poverty.

The rest of the paper is organized as follows. Section two presents the methodology adopted in gathering and analyzing data for this study. The next section reviews literature on African urbanism and encroachment of urban greenery, gentrification debates and sustainable property development. Section four provides an analysis of wetland gentrification and its implication for sustainable property development in African cities. The last section concludes the article and provides relevant policy recommendations.

Methods

The analysis and insights in this article are based on a literature review and desktop research of relevant, related, and available data on African urbanism, urban greenery encroachment, green gentrification, and sustainable property development. The secondary data were gathered from two main sources: journals and policy documents. Key concepts such as African urbanization, urban green spaces, wetland encroachment, green gentrification and sustainable real estate development were used in carrying out search in online databases such as Google Scholar, Elsevier, Taylor and Francis Online, Springer and Sage. We relied on the references of the first set of literature to search for additional materials. In total, more than fifty published documents that report on the key concepts were reviewed for this study. Existing literature (Cobbinah & Darkwah, 2016; Cobbinah & Nyame, 2021; Dodman et al., 2017; Eshetu et al., 2021; Munshifwa et al., 2021) provided an important broader context on the nature of African urbanization and encroachment of urban green spaces across African cities. Specific insights into the status, causes and consequences of wetland encroachment were gleaned from the works of Asumadu et al. (2023), Kuusaana et al. (2021), Andreasen, Agergaard, Allotey, et al. (2022) and Isunju & Kemp (2016) among others. Research by Anguelovski et al. (2019), Blok (2020) and Rigolon & Collins (2023) were helpful in understanding the dynamics of green gentrification in Western contexts. The works of Abdulai & Awuah (2021), Berardi (2013) and Wilkinson et al. (2018) provide useful information on sustainable property development. These studies were complemented by policy documents such as Ramsar Convention on Wetlands (2018), Ministry of Lands and Forestry (1999) and Soz et al. (2016) among others.

Literature Review

African urbanism and encroachment of urban greenery

African urbanism is characterized by rapid population growth and uncontrolled spatial expansion. Studies suggest that African cities are the mostly rapidly growing cities in the world and there are projections that they will experience the highest rate of urban population growth globally in the forthcoming decades (Dodman et al., 2017). Notably, this population growth is occurring in an

expansive rather than a compact form, hence causing a fall in urban population densities and a high rate of land use change (Dodman et al., 2017). It is argued that African urbanism produces numerous adverse changes in human behaviour and urban landscape that affect urban greenery (Cobbinah & Darkwah, 2016; Cobbinah & Nyame, 2021). Significant land use changes in African cities are evident in encroachment and destruction of urban greenery by urban residents, through the increasing search for human habitation, the growth of business activities and the need to live within close proximity of employment hubs (Cobbinah & Darkwah, 2016; Dodman et al., 2017). There are different types of urban greenery in African cities, including semi-private green spaces in residential, commercial, and industrial areas; designated parks, street trees and roadside plantation; public green areas such as green parks, botanical gardens, and recreational centres; and wetlands within and close to urban areas among many others (Fuwape & Onyekwelu, 2011). While recent studies across many African cities point to the fact each of these types of urban greenery has experienced significant encroachment (Abass et al., 2019; Cobbinah & Nyame, 2021; Eshetu et al., 2021), the rate of depletion of urban wetlands outstrips all of them (Kuusaana et al., 2021).

Many African governments recognize the importance of wetlands as habitat for wildlife, for water purification and for the mitigation of flood conditions among many others (Ministry of Lands and Forestry, 1999). Hence, several countries in the continent have signed up for the Ramsar Convention, 1971 and further designated some wetlands within their territory for inclusion in the Ramsar list. It is estimated Africa has about 400 wetlands, which covers an area of approximately 1,341,500 km² and represents 3.98 percent of the continent's total land area (Li et al., 2022). 81 percent of Africa's wetlands are inland while the remaining 19 percent are along the coast (Li et al., 2022). While Africa does not have the highest number of wetlands, it is home to some of the largest wetlands in the world (Xu et al., 2019). Virtually every study on wetlands showcase staggering statistics about the continuous loss of wetlands in different parts of the African continent. Kakuba & Kanyamurwa (2021) indicates that the degradation of Kampala's Kinawataka wetlands has risen from 49 percent in 1992 to 95 percent in present times. Between the year 1984 to 2002, the Malagarasi-muyovozi wetlands has declined by 45 percent, from 36.35km² to 19.91km² (Materu et al., 2018). In Ethiopia, wetland areas in rice producing communities has reduced from 3114 hectares in 1973 to 1060 hectares in 2014 (Desta et al., 2022). Research by Adeleke (2022) shows significant loss of wetlands in six states in Nigeria from 1965 to 2019. He found, among others, that wetlands in Lagos state reduced from 708.96 hectares in 1965 to 7.10 hectares in 2005. In Mozambique, wetlands has reduced by 1.9 percent between 2001 and 2016 (Cianciullo et al., 2023).

Research has shown that wetland encroachment in African cities is caused by the combination of rapid urbanization, industrialization, and real estate development (Asumadu et al., 2023; Munshifwa et al., 2021; Xu et al., 2019). Rapid urbanization – characterized by high population growth and its attendant construction of new residential, commercial, and industrial development and expansion of existing public infrastructure – remains the major threat to wetland conservation in African cities. The main driver of the expansion of African cities is the unregulated acquisition and development of land for residential housing (Andreasen, Agergaard, Kofi, et al., 2022). Owing to the strong demand for housing close to the city for access to workplace and transport, suitable open spaces are developed quickly, leaving only wetlands and river floodplains (White et al., 2017).

The dynamics of consolidation and scarcity of land for development creates strong incentive for traditional landholders to alienate lands to wealthy individuals and big organizations (Andreasen, Agergaard, Kofi, et al., 2022; Asumadu et al., 2023). Kuusaana et al. (2021) for instance identified huge commercial land uses in Kumasi such as fuel retail stations, religious infrastructure, car retail garages and restaurants that have been sited on wetlands. Wetlands located close to roadside are particularly attractive to industries and commercial operators. As these private infrastructure spring up, the state is compelled to expand existing public infrastructure (such as roads, drains, bridges, and dams), sometimes into wetlands, to improve access to public service for surrounding communities.

Studies have noted some consequences of wetland encroachment in many African cities. The destruction of the different types of habitats located upstream of the Lake Kinkony wetlands in Madagascar resulted in sedimentation of lowlands and irreversible silting of water bodies (Weise et al., 2021). Isunju et al. (2016b) pointed out that increased pollution of the wetlands leads to rising water treatment cost and hence increase the cost of water supply to urban residents. They cited the example of the indiscriminate pollution of wetlands in Kampala, which has increased fourfold the monthly cost of water treatment by the National Water and Sewerage Corporation. The process of making products in industries located close to wetlands does not only make huge demands of the natural environment but also produces large quantities of unwanted waste, which often pollutes water sources (Munshifwa et al., 2021). Moreover, the construction of housing and commercial development on wetlands causes urban flooding. In an Accra study by Andreasen, Agergaard, Allotey, et al. (2022), they found that the growing number of housing developments close to and within wetlands in Adenta North, Santa Maria and Pokuase has led to urban flooding during heavy precipitation events and subsequently inundation of houses in these communities. These communities, and many others like them in other African cities, experience increased frequency of flooding because wetlands are not available to control surface run-off (Ministry of Lands and Forestry, 1999). In summary, the previous studies on encroachment of urban greenery have focused on the statistics, causes and consequences and have barely analyzed its relationship with gentrification.

Gentrification Debates

Gentrification has been on the research agenda of urban studies for more than 60 years. Consequently, the empirical research as well as theoretical debates on the complex relationships between urban development processes, neighbourhood change, rent gaps, and social conflicts have dominated much of the discourse on urban growth and inner-city development in Euro-American and Australian contexts (Lees et al., 2015). While the proponents argue that the capitalist logic of the rent gap theory and the aggressive speculation of capitalist agents in the urban real estate market is valid anywhere and, thus, everywhere (Smith, 2002), the critics have pointed out that there are considerable differences in the urban fabrics, urban land tenure systems and cultural attitudes towards land and the city (Maloutas, 2011, 2017). The critics have added that gentrification as a northern concept is not valid under the varied and dynamic circumstances of the global South (Ghertner, 2015). Since the postcolonial turn and debates on comparative urbanism gained momentum, more academic voices have asserted that theories like gentrification do not travel

across the globe and that a “theory from South” on urban development is particularly necessary in urban studies (Parnell & Robinson, 2012; Ren, 2015). They argue that at least an adaptation of the generic concept of gentrification to the “contextual realities in the South” is important (Lemanski, 2014, p. 2957).

For the European and North American gentrification researcher, the stakes are high and they would not back down on claims for generalization because the criticisms of the concept limits the global reach and relevance of their epistemological breakthrough (Lees et al., 2015, 2016). However, there is one central point that all voices in the lively debate do agree upon: there are simply not enough empirical and conceptual studies available on possible gentrification processes in the global South and specifically African cities. We lack empirical and conceptual insights into the varied and highly dynamic processes of urban growth and regeneration in the global South. And we miss Southern debates and dialogues across the hemispheres if we do not engage with a truly postcolonial approach in urban studies in the field of gentrification.

In this article, we attempt to fill an aspect of the knowledge gap. For this purpose, we choose a rather recent aspect of the northern gentrification debate: green gentrification. Green gentrification, also called environmental or ecological gentrification, is mostly researched in the global North (Blok, 2020; Rigolon & Collins, 2023). It implies the stirring up of gentrification processes through the creation of new parks and greenspaces. According to Anguelovski et al. (2018), the primary interest of scholars in this area is not only the processes by which low-income and minority populations are systematically denied access to urban life, but also the exclusion of the most economically vulnerable urban residents to the localized benefits of the ecosystem services. As the scholarship on green gentrification grows, recent studies have sought to extend the concept to interrogate urban development in southern cities. For instance, a Chinese study by Chen et al. (2021) confirmed that green gentrification phenomenon is not only present in Hangzhou but also suggest that large green spaces appear to foster gentrification due to their functional benefits, favourable policy support, elaborate embellishments, and strict management and maintenance regimes. Notably, green gentrification researchers admit that there is lack of studies on the concept in the urban global south (Anguelovski et al., 2019). This research introduces an African variant of green gentrification.

Sustainable property development

The property development sector is receiving growing attention global policies of sustainable development (Berardi, 2013). This is largely because the property development process impacts significantly on energy use, natural resource consumption, waste production, water consumption, biodiversity, climate change and the physical design of urban spaces (Wilkinson et al., 2015). For instance, it is argued that the property development sector as a whole consumes more energy than any other sector and is a growing contributor of greenhouse gas emissions (Wilkinson et al., 2018). The concept of sustainable property development has been introduced to reduce the impact of the human activity of property development on the environment (Razali et al., 2017). Over the years, there has been some definitions of sustainable property development. Wilkinson et al. (2015) notes that sustainable property development is the kind of development that embraces and balances social

aspects such as improving occupier health and wellbeing, environment aspects around using resources efficiently and in the interest of economies to ensure a viable and valuable property industry for future generations. Similarly, it connotes a healthy facility designed and built in a cradle-to-cradle resource efficient manner, using ecological principles, social equity and life-cycle quality value (Berardi, 2013). These definitions notwithstanding, there is a lack of an internationally accepted definition of sustainable property development.

Aside from the definitions, some studies have proposed a set of characteristics or principles to evaluate whether a property development could be considered as sustainable (Berardi, 2013; Wilkinson et al., 2015). According to Wilkinson et al. (2015), these characteristics comprise of land use, urban form and urban quality; environmental protection and enhancement; location and transport; resource use; and business and community characteristics. They argue, among others, that sites should be designed to meet the needs of end users with consideration given to how the buildings, infrastructure and open space will be used in practice while creating attractive spaces. Considering and preserving ecological values, including locally, nationally, and internationally important species and retaining or improving habitat values is increasingly recognized as an environmental concern. The construction and operation of buildings can produce pollutants that are detrimental to humans, flora and fauna and can sterilize land for long periods of time. As a result, sustainable property development should consider minimizing or avoiding polluting emissions during construction and operation. Access to a variety of modes of transport and local amenities are important in sustainable property development. There should be community engagement within the planning and construction process of sustainable property development. There should be conscious effort to prevent property development from being discriminatory on physical access grounds but should ensure access to accommodation and amenities by range of people to promote equality and diversity. Safety and security concerns should not be overlooked in sustainable property development.

Berardi (2013) also proposed that sustainable property development should (a) apply the general principles of sustainability (b) involve all interested parties through a collaborative approach (c) be completely integrated into the relevant local plans and infrastructure and connect into the existing services, networks and grids (d) have its environmental impact minimized (e) provide social and cultural value over time and for all people in a way that promotes a sense of place (f) be healthy, comfortable, safe and accessible for all among others. Empirical research across African countries indicates mixed implementation of the characteristics of sustainable property development. On one hand, a Nigerian study by Oladokun & Shiyabola (2021) assessed that the availability of sustainable features in 95 office buildings in Lagos. Findings revealed features for energy conservation (such as use of LED lighting, natural ventilation service and renewable energy), water conservation (such as water efficient fittings, low water consuming features and rainwater collection), health and wellbeing (use of sustainable materials, reduction of air pollution and tobacco and smoke control) and material use and construction (such as use of durable and recyclable materials) were available in the buildings. On the other hand, research by Abdulai & Awuah (2021) shows that the uptake of sustainable property development in Ghana has been extremely low. This is because only a few buildings in the health and commercial real estate sectors are currently classified by green buildings, based on three sustainability rating systems in the

country. They concluded that the property development sector is not contributing significantly towards the attainment of the sustainable development goals.

Analysis and Discussion

Wetland gentrification in African cities

As indicated in Figure 1, wetland gentrification in African cities is characterized by four specific features:

a. Urbanization, customary stewardship and rise in property values

Urban wetlands targeted for sale by customary authorities to developers for property development are typically located in urban neighborhoods with high land values. It is argued that a significant proportion – approximately 60 percent – of lands in Africa is held under customary form of ownership (Anafo et al., 2023; The Rights and Resources Initiative, 2015). In Ghana for instance, more than 70 percent of all lands is controlled by customary authorities (Ehwi & Asante, 2016). There is also evidence that more than 80 percent of Uganda’s land is held under customary tenure (Ntungwa, 2021). Consequently, the right to alienate customary lands rests with the bona fide customary authorities, but in accordance with appropriate statutory processes. The spatial pattern of global urbanization indicates that Africa is the new epicentre of urbanization and is expected to experience the highest rate of urban population growth globally in the coming decades (Dodman et al., 2017). As African cities expand into the urban fringes, customary authorities initiate the process of land conversion by requesting municipal authorities to prepare local plans and demarcate agricultural lands into building plots for the development of residential and commercial properties (Akaateba et al., 2021). Owing to the oversight of municipal authorities in the preparation of plans and demarcation of lands, wetlands tend to be preserved initially, as they are considered unsuitable for habitation. Likewise, developers show little or no interest in wetlands at this time due to the availability of suitable building plots. Over time, peri-urban neighborhoods become increasingly urbanized, as all lands are fully developed, leaving only wetlands. In some urban neighbourhoods, these wetlands occupy prime and strategic inner-city spaces close to major roads and intersections. Studies in Ghana, Ethiopia and Zambia have indicated that rapid urbanization coupled with burgeoning property values are significant driving forces leading to alienation of wetlands for property development (Asumadu et al., 2023; Hailu et al., 2020; Munshifwa et al., 2021).

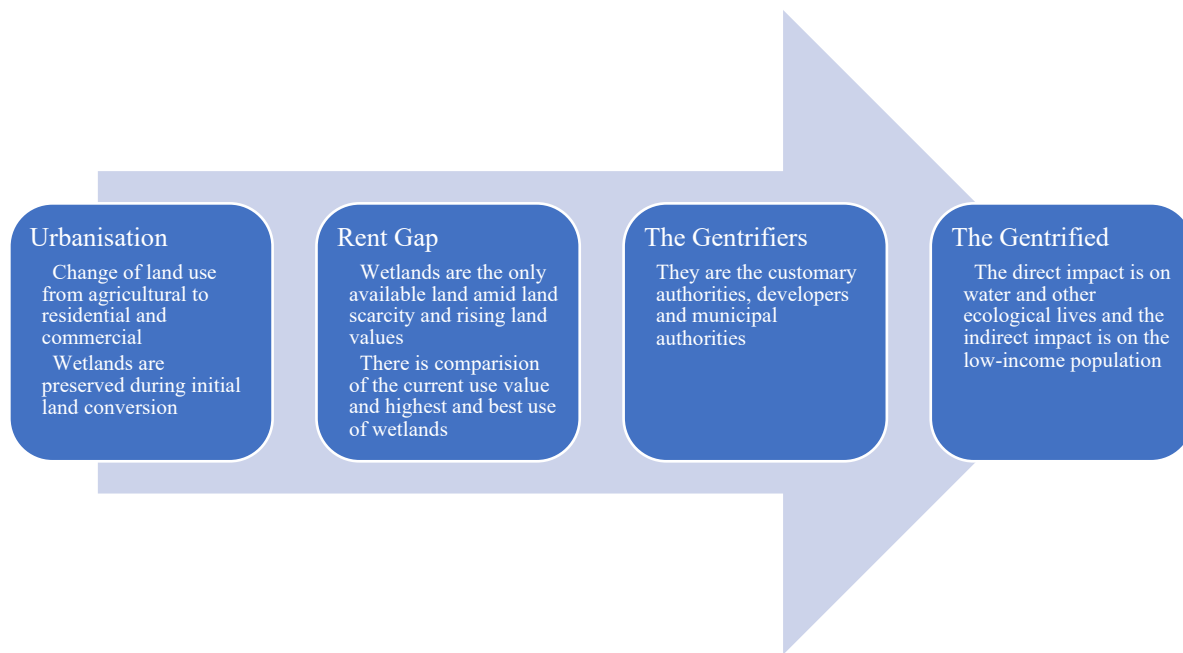


Figure 1: The process of wetland gentrification in African cities
Source: Authors' Construct (2023)

b. The rent gap question

As urban neighbourhoods become fully developed and real estate prices shore up, this changes the economic calculations associated with wetlands (Andreasen, Agergaard, Kofi, et al., 2022). The high land values of the urban neighbourhoods within which wetlands are located create a strong incentive for traditional authorities to commercialize wetlands. The edge to reap monetary gains from available lands is particularly stronger among traditional authorities – in capital and large cities – whose predecessors may have alienated all lands in their jurisdiction. For instance, a recent Kumasi study by Kidido & Biitir (2022) demonstrated that new chiefs, who took over from past chiefs or after a period of traditional power vacuum, gave instructions to all developers in their towns' peripheries to submit documents to the palace for inspection. They added that the outcome of obeying such orders is that new documents were issued, and money charged. The study emphasized that this outcome has become a common practice in the Ghanaian land market whenever a new chief assumes the reign of power (Kidido & Biitir, 2022). More to the point, across many African countries, there is growing abuse of fiduciary powers vested in customary authorities, leading to wanton sale of lands held in trust for the members of the landowning group (Anafo, 2015; Schoneveld, 2017). Often time, such alienation takes place with engagement with community members or residents (Schoneveld, 2017). Similar practice is at play when customary authorities seek to extract monetary gains by offering urban wetlands for sale to developers. The sale of urban wetlands by customary authorities is underpinned by the assumption that the current use or ecological value of a 'marginal' wetland is significantly lesser than the value that will accrue when the wetland is put to its highest and best use of property development. Put differently, 'people are looking at the economic worth of wetlands and not the environmental importance' (Adetayo, 2022). To attract prospective buyers, chiefs would sometimes offer urban wetlands at relatively lower price than the open market value (Asumadu et al., 2023). From the perspective of developers,

acquiring urban wetlands for development is an opportunity to gain access to affordable land in desired locations (Andreasen, Agergaard, Kofi, et al., 2022).

c. The Gentrifiers

Wetland gentrification is perpetrated by an alliance of wealthy and powerful urban actors. They are customary authorities who alienate wetlands, developers who build on wetlands and municipal authorities who grant building permits. Previous studies have overly focused on the wetland encroachment by slum development and livelihood activities of the poor and marginalized urban populations (Abu & Codjoe, 2018; Ajibade & McBean, 2014; Amoako & Inkoom, 2018; Jordhus-Lier et al., 2019). According to Andreasen, Agergaard, Allotey, et al. (2022), the preoccupation with the encroachment of the poor obscures the link between wetlands and the wider urban development practices in African cities. They contend that the development activities of middle and high-income groups also encroach on wetlands and other ecologically sensitive spaces in cities. It is these groups who have the financial strength to fund the cost of landfilling required to bring a wetland to the state suitable for real estate development. For instance, Andreasen, Agergaard, Allotey, et al. (2022) indicated that their three case studies sites – Adenta North, Santa Maria, and Pokuase – in Accra where wetland encroachment is rife, is mostly inhabited by middle and high-income homebuilders. In the case of Pokuase they found that ‘the low-lying wetlands on the western side of the Accra-Nsawam highway have attracted individual builders ... who have filled up the wetlands with stones and sand and built bungalows of varying sizes’. The power wielded by these homebuilders is so immense that they can maneuver statutory processes to secure permits to develop real estate on wetlands and can prevent municipal authorities from demolishing such properties (Kuusaana et al., 2021). Municipal authorities, perhaps, may be enticed by encroachers to compromise on wetland encroachment due to the possibility of collecting the property rates from these developers to improve internally generated funds (Adetayo, 2022; Asumadu et al., 2023).

d. The Gentrified: Displacement beyond human population

The main characteristic that distinguishes wetland gentrification from all other forms of gentrification is that the development activities of the gentrifiers has displacement consequences for both the ecological ecosystem in wetlands and human population. The first and direct displacement affects the different non-living (water and soil) and living (plant and animal) elements of wetlands. Real estate development dries up or diverts the course of water in wetlands, jeopardizing efforts of African countries towards the protection of water-related ecosystems to ensure they continue to provide social and economic services and benefits to society (United Nations, 2018). It, simultaneously, eliminates the different soil layers and landforms that play a role in preserving the water within wetlands. The absence of the water and soils leads to the death of the plants as they lack the ecological support systems to grow. The presence of water and the wide array of plants in wetlands makes them a suitable habitat for different varieties of animals. Property development leads to the destruction of the habitat of the animals in wetlands, causing the death of some and relocation of others. The second and indirect displacement affects human populations through urban flooding. One of the key functions of wetlands is its effectiveness for flood abatement. Property development undermines this function of wetlands and aggravates flooding in many parts of the African cities. Although urban flooding may affect both rich and poor

neighbourhoods, ‘poor city neighbourhoods are more prone to flooding and other natural disasters than wealthy neighbourhoods’ (Campion, 2012, p. 35). Numerous scholarly research have demonstrated that urban flooding has led to the displacement of many poor and vulnerable households and communities (Amoako & Inkoom, 2018; Isunju et al., 2016b; Korah & Cobbinah, 2016). However, there is also evidence that the middle- and high-income groups suffer urban flooding (Andreasen, Agergaard, Allotey, et al., 2022).

Implication of wetland gentrification for sustainable property development

The quest for sustainable property development has become critical in this era of growing urbanization and a changing climate, with their accompanying socio-economic and human health challenges (Cobbinah & Nyame, 2021). This is because sustainable property development promotes the preservation of urban greenery, makes room for the participation of all interested parties in development projects, improves water quality and availability, and enhances flood control (Berardi, 2013; Wilkinson et al., 2015). In this section, we demonstrate that wetland gentrification defeats these important characteristics of sustainable property development. In simple terms, we conceptualize wetland gentrification as synonymous with *unsustainable* property development.

To begin with, municipal authorities across Africa are empowered by legislations and policies to protect wetlands and refuse permits for property development, in accordance with sustainable urban development. For instance, according to the Accra Metropolitan Assembly (Environmental Protection) Byelaws, 2017, the assembly shall in conjunction with the Lands Commission refuse to grant permit for development or a lease in respect of a Ramsar site or ecologically sensitive area to a prospective developer. Likewise, in August 2015, Uganda’s Ministry of Water and Environment launched a wetland atlas for Kampala and neighbouring districts of Mukono and Wakiso in a bid to raise awareness about the importance of wetlands, following a cabinet directive to cancel all illegal land titles in wetlands and evict encroachers (Isunju et al., 2016a). This notwithstanding, the incidence of wetland gentrification signifies that some property development in African cities is taking place in urban wetlands. The emergence of these properties raises questions about urban land governance in terms of the legislative regulatory frameworks and the capacity of the institutions in place for protecting and managing urban wetlands (Cobbinah & Nyame, 2021). More importantly, these property developments deplete urban greenery and compromise their ecological benefits. Such properties are very costly to develop, as extreme weather conditions can cause delays or damages which can result in cost overruns. Properties developed in wetlands also risk structural failures since the soils and other conditions may not be suitable to hold the structural loads (Asumadu et al., 2023).

Secondly, sustainable property development strongly supports the participation of interested parties (Berardi, 2013). Such engagement is crucial to ensure that property development is implemented in a manner that meets the needs and aspirations of communities while minimizing the negative impact on the environment and promoting social and economic wellbeing. Nevertheless, we have learnt from the concept of wetland gentrification that decisions of whether to alienate land and grant permit for property development is typically monopolized by customary authorities, while

making little or no room for community participation. Recent studies have shown that the customary land governance systems in the urban settings of African cities have collapsed in favour of commoditized systems due to the growing demand of land for residential, commercial and industrial purposes (Yaro, 2010). This is further compounded by the absence of rigorous checks and balances in the customary fiduciaries, resulting in the exploitative and iniquitous conduct in the land alienation processes (Anafo et al., 2023; Schoneveld, 2017). The development of urban wetlands often comes as surprise to urban resident, due to the absence of citizen participation.

Thirdly, an important consideration in sustainable property development is the need to minimize the environmental impact of development activities on water and ecological resources. This is particularly crucial in Africa, where access to water resources is not yet universal, with 1 in 3 people facing water scarcity and about 400 million people lacking access to basic drinking water (Holtz & Golubski, 2021). There are expectations that the property development sector can help mitigate the water crisis by using non-potable water for construction activities, installing rainwater harvesting systems and using water efficient systems and fixtures among others. Nevertheless, through the processes of wetland gentrification, property development in ecologically sensitive areas is having adverse impact on water quality and availability and is likely to worsen the water crisis for residents of African cities. For instance, studies in Congo and Ghana have shown that one of the most critical harmful effect of developing property in wetlands is deterioration in water quality (Asumadu et al., 2023; Mbala et al., 2019). This is because property development results in increased sedimentation, which is the largest causes of water pollution (Houser & Pruess, 2009). In the absence of wetlands, water quality will suffer, as there is no natural resource to reduce the organic and inorganic pollutants through different physical, chemical, and biological processes; neither will there be a sponge to reduce erosion and prevent sediments from being transported downstream. Not only does property development in wetlands affect water quality, it has a negative impact on water supply for essential household activities such as cooking, bathing, and washing (Xu et al., 2019). Apart from water quality and supply, property development in wetlands has resulted in marked decrease or extinction in the population of plant and animal species. Specifically, development activities such as excavation and landfilling which are essential in stabilizing wetlands to ensure structural integrity of buildings tend to disturb, endanger and bring about the extinction of aquatic and terrestrial lives that depend on wetlands for survival (Asumadu et al., 2023). Studies have demonstrated that 21 percent of the freshwater species – including fish, crabs, dragonflies and selected families of aquatic plants – in continental Africa are threatened with extinction, putting the livelihoods of millions of people at risk (International Union for Conservation of Nature and Natural Resources, 2010).

To cap it all, sustainable property development makes provision for adequate urban greenery that can absorb water and reduce or eliminate the incidence of flooding. Property development in wetlands, on the other hand, causes urban flooding and subsequent displacement of human population from their communities. One of the major causes of urban flooding in African cities is the rapid expansion of settlements and public infrastructure into ecologically sensitive areas. The consequence of this expansion is the hardening of catchment areas by buildings, roads, and other impermeable surfaces, preventing water from infiltrating into the soil and causing it to run off into drainage systems and waterways, thereby increasing the chance of flooding (Lucas, 2020).

Essentially, property development in wetlands results in the loss of flood control capability performed by wetlands (Mbala et al., 2019; Xu et al., 2019). When flooding occurs, it is typically the poor households who suffer the impact in terms of loss of income, belongings, and displacement. Sadly, only a few of the affected poor people can afford the cost of relocation. For instance, a Kumasi study revealed that, despite suffering annual flooding, over 60 percent of the respondents indicated they could not afford the cost of moving to another accommodation; 10 percent stayed on proximity to workplace or had businesses located in the flood risk area; and 19 percent remained because they have either lived in the area all their lives or because it was a family home (Jha et al., 2012; Lucas, 2020). More so, property owners experience a drop or loss of rental income, as prospective tenants stay away from flood prone areas (Attakora-Amaniampong et al., 2016). Yet, they may incur high cost of maintenance, as property development in wetlands can lead to long-term battles with water surges and continuous flooding (Asumadu et al., 2023). The valuables of people are also destroyed during flooding. The loss of income, high cost of property maintenance, and displacement, caused by flooding, has the potential to deepen urban poverty and widen urban inequality.

Concluding remarks

The primary objective of this article was to analyze the concept of wetland gentrification in African cities and its implication for sustainable property development. This article has demonstrated that the novel concept of wetland gentrification draws on and sits at the confluence of extant literature on African urbanism, wetland encroachment and green gentrification. It shows that there are marked differences between the dynamics of urbanization, property development and urban displacement in Western and African cities. As opposed to green gentrification in Western cities, whereby environmental improvements drive up real estate prices and subsequent displacement of low-income residents, this article demonstrates that wetland gentrification occurs when land scarcity and rising property values in cities cause indiscriminate depletion of urban wetlands, leading to the displacement of ecological resources and human populations. Our findings point to the limitation of the northern conception of green gentrification and its less applicability in some southern contexts. Broadly, this article has contributed to the discourse on advancing a collective environmental consciousness among property development stakeholders and their responsibility towards the protection of essential urban wetlands (Asumadu et al., 2023; Cobbinah & Nyame, 2021). Specifically, the findings of this study provide customary authorities, municipal authorities, and private developers across Africa and the global south with the necessary insights about the risks and consequences associated with the alienation, approval, and development of wetlands.

We have argued that wetland gentrification is characterized by four distinct but interrelated features. One, the urbanization processes and customary stewardship in African cities renders wetlands potential target for alienation. Two, the eventual sale of wetlands by customary authorities and subsequent permit approval by municipal authorities is driven by the rent gap assumption that the current ecological value of wetlands is significantly less than the potential highest and best value of converting for residential and commercial purposes. Three, the actors of wetland gentrification are wealthy and influential people who can navigate alienation, municipal approval, and demolition. Four, it causes the displacement of wetland elements (water, soil, flora, and fauna)

and subsequently human population through urban flooding. We have also demonstrated that the incidence of wetland gentrification in African cities signifies that a considerable number of landed properties are not developed in a sustainable manner. This article has highlighted four implications of wetland gentrification for sustainable property development. First, it does not only deplete urban greenery, involves high cost of development, risks structural failures but also raises questions about the law enforcement and the capacity of institutions charged with the responsibility of protecting wetlands. Second, it has the tendency to collapse the customary land governance systems, where urban residents and communities would not have a voice in the alienation of wetlands. Third, it has negative impact on water quality and supply as well as well as extinction of vital plant and animal population in wetlands. Lastly, the hardening of wetlands through property development causes urban flooding, which leads to loss of income and belongings, high cost of property maintenance and displacement of low-income populations. Based on these implications, we conceive wetland gentrification as one of the ‘wicked problems’ in African society, which requires urgent policy attention.

This article provides some policy recommendations for consideration. Firstly, although the International Finance Corporation and other green-oriented institutions are vigorously educating built environment professionals and real estate development organizations about the relevance of designing and developing properties to reduce energy, water, and material consumption, there is the need for extensive public education about the significance of wetlands to human existence (Asumadu et al., 2023). This should be complemented with strict enforcement of land and environmental laws to protect wetlands in strategic urban locations. As done in Uganda, municipal authorities could create an atlas of wetlands and declare them as unqualified for permit approval (Isunju et al., 2016a). The declaration could be in the form of a legible notice placed at the site of the wetland. This would deter customary authorities from alienating wetlands and private developers from acquiring it for property development. However, where property development in a wetland is being given consideration, there should be deep consultation between customary authorities, the developer, civil society, and municipal authorities. There should be assurance that adequate measures have been taken to minimize future environmental impact. Otherwise, citizen groups and civil society should contest, through protest and litigation, the development of properties on wetlands (Schoneveld, 2017).

Secondly, this article has indicated that land scarcity coupled with the high demand for property development drives wetland encroachment. As a solution to the land scarcity conundrum, it has been suggested by Asumadu et al. (2023) that African countries should emulate Asian countries such as Singapore by resorting to the development of vertical cities (Wong, 2004). Nevertheless, Agyemang et al. (2018) have cautioned African countries against the embracing high-rise buildings as sustainable property development pathway. They argue that Ghana and African countries more broadly should pursue high-rise development with circumspection, as there is low social acceptability of high-rise developments and a weak institutional capacity for efficient service delivery. We agree with Agyemang et al. (2018) that the design and promotion of high-rise developments should be tailored to meet the needs of the people for whom they are built and recognize the importance of effective service delivery. The development of vertical cities will

require individuals and developers to come together through housing cooperatives to develop properties.

Lastly, this study shows that urban wetlands in African cities are depleting at a very fast pace. In replenishing the loss of the natural wetlands, it is recommended that African countries invest in man-made or constructed wetlands. Constructed wetlands duplicates the processes occurring in natural wetlands by providing the system in which water, soil, plants, animals, microorganisms, and the environment interact to create a wildlife habitat, improve water quality, and control flooding. Studies have shown that constructed wetlands are less costly to build and maintain and as such suitable for developing countries with plentiful lands and limited funds (Griffith, 1992). As this study is based on a review of literature, we suggest that further research should focus on providing empirical insights in different African cities to enrich and expand the discourse of wetland gentrification.

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References

- Abass, K., Afriyie, K., & Gyasi, R. M. (2019). From green to grey: the dynamics of land use/land cover change in urban Ghana. *Landscape Research*, 44(8), 909–921. <https://doi.org/10.1080/01426397.2018.1552251>
- Abdulai, R. T., & Awuah, K. G. B. (2021). *Sustainable Real Estate in the Developing World* (R. T. Abdulai & K. G. B. Awuah (eds.)). Emerald Publishing Limited.

- Abu, M., & Codjoe, S. N. A. (2018). Experience and future perceived risk of floods and diarrheal disease in urban poor communities in accra, ghana. *International Journal of Environmental Research and Public Health*, 15(12), 1–16. <https://doi.org/10.3390/ijerph15122830>
- Adeleke, B. O. (2022). Need for Emergency response to Wetlands Loss in Southwestern Nigeria: A Review. *Ghana Journal of Geography*, 14(3), 90–114.
- Adetayo, O. (2022). #SinkingCities: In Lagos, Nigeria's commercial hub, wetlands have been sacrificed for real estate profits. Unbias the News October 26. <https://www.thecable.ng/sinkingcities-in-lagos-nigerias-commercial-hub-wetlands-have-been-sacrificed-for-real-estate-profits>
- Agyemang, F. S. K., Silva, E., & Aboagye, P. (2018). Towards sustainable urban development: the social acceptability of high-rise buildings in a Ghanaian city. *GeoJournal*, 83(6), 1317–1329. <https://doi.org/10.1007/s10708-017-9837-0>
- Ajibade, I., & McBean, G. (2014). Climate extremes and housing rights: A political ecology of impacts, early warning and adaptation constraints in Lagos slum communities. *Geoforum*, 55, 76–86. <https://doi.org/10.1016/j.geoforum.2014.05.005>
- Akaateba, M. A., Ahmed, A., & Inkoom, D. K. B. (2021). Chiefs, land professionals and hybrid planning in Tamale and Techiman, Ghana: Implications for sustainable urban development. *International Journal of Urban Sustainable Development*, 13(3), 464–480. <https://doi.org/10.1080/19463138.2021.1971990>
- Alabi, M. O. (2022). Encroachment on green open space, its implications on health and socio-economy in Akure, Nigeria. *Cities & Health*, 6(1), 123–135. <https://doi.org/10.1080/23748834.2019.1639421>
- Amoako, C., & Inkoom, D. K. B. (2018). The production of flood vulnerability in Accra, Ghana: Re-thinking flooding and informal urbanisation. *Urban Studies*, 55(13), 2903–2922. <https://doi.org/10.1177/0042098016686526>
- Anafo, D. (2015). Land reforms and land rights change: A case study of land stressed groups in the Nkoranza South Municipality, Ghana. *Land Use Policy*, 42, 538–546. <https://doi.org/10.1016/j.landusepol.2014.09.011>
- Anafo, D., Ayamga, A., & Domanban, P. B. (2023). Custom, modernity, and stability of land rights in Ghana: An empirico-legal review. *Cogent Social Sciences*, 9(1), 1–16. <https://doi.org/10.1080/23311886.2023.2209366>
- Andreasen, M. H., Agergaard, J., Allotey, A. N. M., Møller-Jensen, L., & Oteng-Ababio, M. (2022). Built-in Flood Risk: The Intertwinement of Flood Risk and Unregulated Urban Expansion in African Cities. *Urban Forum*, 1–27. <https://doi.org/10.1007/s12132-022-09478-4>
- Andreasen, M. H., Agergaard, J., Kofi, R. Y., Moller-Jensen, L., & Oteng-Ababio, M. (2022). Urban encroachment in ecologically sensitive areas: drivers, impediments and consequences. *Buildings and Cities*, 3(1), 920–938. <https://doi.org/10.5334/bc.210>
- Angelovski, I., Connolly, J. J. T., Garcia-lamarca, M., Cole, H., & Pearsall, H. (2019). New scholarly pathways on green gentrification: What does the urban 'green turn' mean and where is it going? *Progress in Human Geography*, 43(6), 1064–1086. <https://doi.org/10.1177/0309132518803799>
- Angelovski, I., Connolly, J. J. T., Masip, L., & Pearsall, H. (2018). Assessing green gentrification in historically disenfranchised neighborhoods: a longitudinal and spatial analysis of Barcelona. *Urban Geography*, 39(3), 458–491. <https://doi.org/10.1080/02723638.2017.1349987>
- Asumadu, G., Quaigrain, R., Edwards, D. J., Kukah, A. S. K., & Nsafoah, S. K. (2023). Analysis

- of risks factors associated with construction projects in urban wetlands ecosystem. *International Journal of Sustainable Development & World Ecology*, 30(2), 198–210. <https://doi.org/10.1080/13504509.2022.2130465>
- Attakora-Amaniampong, E., Owusu-Sekyere, E., & Aboagye, D. (2016). Urban floods and residential rental values nexus in Kumasi, Ghana. *Ghana Journal of Development Studies*, 13(2), 176. <https://doi.org/10.4314/gjds.v13i2.10>
- Azagew, S., & Worku, H. (2020). Accessibility of urban green infrastructure in Addis - Ababa city , Ethiopia : current status and future challenge. *Environmental Systems Research*, 9(26), 1–20. <https://doi.org/10.1186/s40068-020-00187-0>
- Berardi, U. (2013). *Moving to Sustainable Buildings: Paths to Adopt Green Innovations in Developed Countries*. Versita.
- Blok, A. (2020). Urban green gentrification in an unequal world of climate change. *Urban Studies*, 57(14), 2803–2816. <https://doi.org/10.1177/0042098019891050>
- Campion, B. B. (2012). *Urban Wetland Ecology And Floods In Kumasi , Ghana*. [University of Bremen]. <https://d-nb.info/1072045885/34>
- Chen, Y., Xu, Z., Byrne, J., Xu, T., Wang, S., & Wu, J. (2021). Can smaller parks limit green gentrification? Insights from Hangzhou, China. *Urban Forestry and Urban Greening*, 59(January), 127009. <https://doi.org/10.1016/j.ufug.2021.127009>
- Cianciullo, S., Attorre, F., Trezza, F. R., Rezende, M., Ntumi, C., Campira, J., Munjovo, E. T., Timane, R. D., Riccardi, T., & Malatesta, L. (2023). Analysis of land cover dynamics in Mozambique (2001–2016). *Rendiconti Lincei. Scienze Fisiche e Naturali*, 34(1), 81–92. <https://doi.org/10.1007/s12210-023-01133-9>
- Cobbinah, P. B., & Darkwah, R. M. (2016). African Urbanism: The Geography of Urban Greenery. *Urban Forum*, 27, 149–165. <https://doi.org/10.1007/s12132-016-9274-z>
- Cobbinah, P. B., & Nyame, V. (2021). A city on the edge: the political ecology of urban green space. *Environment and Urbanization*, 33(2), 413–435. <https://doi.org/10.1177/09562478211019836>
- Dar, S. A., Bhat, S. U., Rashid, I., & Dar, S. A. (2020). Current Status of Wetlands in Srinagar City: Threats, Management Strategies, and Future Perspectives. *Frontiers in Environmental Science*, 7(199), 1–11. <https://doi.org/10.3389/fenvs.2019.00199>
- Davidson, N. C. (2014). How much wetland has the world lost? Long-term and recent trends in global wetland area. *Marine and Freshwater Research*, 65, 934–941.
- Desta, M. A., Zeleke, G., Payne, W. A., & Abebe, W. B. (2022). Impact of Rice Expansion on Traditional Wetland Management in the Tropical Highlands of Ethiopia. *Agriculture*, 12(7), 1–17. <https://doi.org/10.3390/agriculture12071055>
- Dixon, A., Wood, A., & Hailu, A. (2021). Wetlands in Ethiopia: Lessons From 20 years of Research, Policy and Practice. *Wetlands*, 41(20), 1–14. <https://doi.org/10.1007/s13157-021-01420-x>
- Dodman, D., Leck, H., Rusca, M., & Colenbrander, S. (2017). African Urbanisation and Urbanism: Implications for risk accumulation and reduction. *International Journal of Disaster Risk Reduction*, 26, 7–15. <https://doi.org/10.1016/j.ijdrr.2017.06.029>
- Ehwi, R. J., & Asante, L. A. (2016). Ex-Post Analysis of Land Title Registration in Ghana Since 2008 Merger: Accra Lands Commission in Perspective. *SAGE Open*, 6(2). <https://doi.org/10.1177/2158244016643351>
- Eshetu, S. B., Yeshitela, K., & Sieber, S. (2021). Urban green space planning, policy implementation, and challenges: The case of Addis Ababa. *Sustainability (Switzerland)*, 13(20), 1–14. <https://doi.org/10.3390/su132011344>

- Fuwape, J. A., & Onyekwelu, J. C. (2011). Urban Forest Development in West Africa: Benefits and Challenges. *Journal of Biodiversity and Ecological Sciences*, 1(1), 77–94.
- Gardner, R. C., Connolly, K. D., & Bamba, A. (2009). African Wetlands of International Importance: Assessment of Benefits Associated with Designations under the Ramsar Convention. *The Georgetown International Environmental Law Review*, 21, 257–294.
- Ghertner, D. A. (2015). Why gentrification theory fails in ‘much of the world.’ *City*, 19(4), 552–563. <https://doi.org/10.1080/13604813.2015.1051745>
- Griffith, K. L. (1992). *Constructed Wetlands: A growing opportunity for the construction industry* [Massachusetts Institute of Technology]. <https://core.ac.uk/download/pdf/4410201.pdf>
- Hailu, A., Mammo, S., & Kidane, M. (2020). Land Use Policy Dynamics of land use, land cover change trend and its drivers in Jimma Geneti District, Western Ethiopia. *Land Use Policy*, 99, 1–18. <https://doi.org/10.1016/j.landusepol.2020.105011>
- Hassan, T. Y., Majid, M. R., Davidson, S. A. A., & Medugu, N. I. (2014). Role of Wetlands in Mitigating the Effect of Climate Change in Nigeria. In W. L. Filho (Ed.), *Handbook of Climate Change Adaptation* (pp. 1–12). Springer-Verlag. <https://doi.org/10.1007/978-3-642-40455-9>
- Hettiarachchi, M., Morrison, T. H., & McAlpine, C. (2015). Forty-three years of Ramsar and urban wetlands. *Global Environmental Change*, 32, 57–66. <https://doi.org/10.1016/j.gloenvcha.2015.02.009>
- Holtz, L., & Golubski, C. (2021). Addressing Africa’s extreme water insecurity. *Africa in Focus July 23*. <https://www.brookings.edu/blog/africa-in-focus/2021/07/23/addressing-africas-extreme-water-insecurity/>
- Houser, D. L., & Pruess, H. (2009). The effects of construction on water quality : a case study of the culverting of Abram Creek. *Environmental Monitoring and Assessment*, 155, 431–442. <https://doi.org/10.1007/s10661-008-0445-9>
- International Union for Conservation of Nature and Natural Resources. (2010). *African freshwater species threatened - livelihoods at stake*. <https://www.iucn.org/content/african-freshwater-species-threatened-livelihoods-stake>
- Isunju, J. B., & Kemp, J. (2016). Spatiotemporal analysis of encroachment on wetlands: A case of Nakivubo wetland in Kampala, Uganda. *Environmental Monitoring and Assessment*, 188(203), 1–17. <https://doi.org/10.1007/s10661-016-5207-5>
- Isunju, J. B., Orach, C. G., & Kemp, J. (2016a). Community-level adaptation to minimize vulnerability and exploit opportunities in Kampala’s wetlands. *Environment and Urbanization*, 28(2), 475–494. <https://doi.org/10.1177/0956247816647342>
- Isunju, J. B., Orach, C. G., & Kemp, J. (2016b). Hazards and vulnerabilities among informal wetland communities in Kampala, Uganda. *Environment and Urbanization*, 28(1), 275–293. <https://doi.org/10.1177/0956247815613689>
- Jha, A. K., Bloch, R., & Lamond, J. (2012). *Cities and Flooding: A Guide to Integrated Urban Flood Risk Management for the 21st Century*. The World Bank.
- Jordhus-Lier, D., Saaghus, A., Scott, D., & Ziervogel, G. (2019). Adaptation to flooding, pathway to housing or ‘wasteful expenditure’? Governance configurations and local policy subversion in a flood-prone informal settlement in Cape Town. *Geoforum*, 98, 55–65. <https://doi.org/10.1016/j.geoforum.2018.09.029>
- Kakuba, S. J., & Kanyamurwa, J. M. (2021). Management of wetlands and livelihood opportunities in Kinawataka. *Environmental Challenges*, 2, 1–12. <https://doi.org/10.1016/j.envc.2020.100021>
- Kidido, J. K., & Biitir, S. B. (2022). Customary succession and re-issuance of land documents in Ghana: Implications on peri-urban land developers in Kumasi. *Land Use Policy*, 120, 1–11.

- <https://doi.org/10.1016/j.landusepol.2022.106270>
- Korah, P. I., & Cobbinah, P. B. (2016). Juggling through Ghanaian urbanisation: flood hazard mapping of Kumasi. *GeoJournal*, 1–18. <https://doi.org/10.1007/s10708-016-9746-7>
- Kuusaana, E. D., Ahmed, A., Campion, B. B., & Dongzagla, A. (2021). Characterisation and typology of urban wetlands in Ghana : Implications for the governance of urban commons in secondary cities in Africa. *Urban Governance*, 1(1), 38–50. <https://doi.org/10.1016/j.ugj.2021.09.002>
- Lees, L., Shin, H. B., & Lopez-Morales, E. (2015). *Global Gentrifications: Uneven development and displacement* (L. Lees, H. B. Shin, & E. Lopez-Morales (eds.)). Policy Press.
- Lees, L., Shin, H. B., & Lopez-Morales, E. (2016). *Planetary Gentrification*. Polity Press.
- Lemanski, C. (2014). Hybrid gentrification in South Africa: Theorising across southern and northern cities. *Urban Studies*, 51(14), 2943–2960. <https://doi.org/10.1177/0042098013515030>
- Li, A., Song, K., Chen, S., Mu, Y., Xu, Z., & Zeng, Q. (2022). Mapping African wetlands for 2020 using multiple spectral, geo-ecological features and Google Earth Engine. *ISPRS Journal of Photogrammetry and Remote Sensing*, 193, 252–268.
- Lucas, B. (2020). *Flood risk management in Africa*. <https://doi.org/10.1111/jfr3.12612>
- Maloutas, T. (2011). Contextual Diversity in Gentrification Research. *Critical Sociology*, 38(1), 33–48. <https://doi.org/10.1177/0896920510380950>
- Maloutas, T. (2017). Travelling concepts and universal particularisms: A reappraisal of gentrification’s global reach. *European Urban and Regional Studies*, 1–16. <https://doi.org/10.1177/0969776417709547>
- Materu, S. F., Urban, B., & Heise, S. (2018). A critical review of policies and legislation protecting Tanzanian wetlands. *Ecosystem Health and Sustainability*, 4(12), 310–320. <https://doi.org/10.1080/20964129.2018.1549510>
- Mbala, M., Aigbavboa, C., & Aliu, J. (2019). Reviewing the Negative Impacts of Building Construction Activities on the Environment: The Case of Congo. In J. Charytonowicz & C. Falcão (Eds.), *Advances in Human Factors, Sustainable Urban Planning and Infrastructure*. https://link.springer.com/chapter/10.1007/978-3-319-94199-8_11#citeas
- Ministry of Lands and Forestry. (1999). *Managing Ghana’s Wetlands: A National Wetlands Conservation Strategy*. https://www.ramsar.org/sites/default/files/documents/library/national_wetland_policies_-_ghana.pdf
- Munshifwa, E. K., Mwenya, C. M., & Mushingi, A. (2021). Urban Development, Land Use Changes and Environmental Impacts in Zambia’s Major Cities: A Case Study of Ndola. In R. T. Abdulai & K. G. B. Awuah (Eds.), *Sustainable Real Estate in the Developing World* (pp. 63–82). Emerald Publishing Limited.
- Ntunga, D. (2021). *Certificates of Customary Ownership yet to guarantee women’s land security*. Oxfam 24 March. <https://uganda.oxfam.org/latest/press-release/certificates-customary-ownership-yet-guarantee-womens-land-security>
- Oladokun, T. T., & Shiyanbola, R. E. (2021). Sustainable Features in Commercial Real Estate in Nigeria. In R. T. Abdulai & K. G. B. Awuah (Eds.), *Sustainable Real Estate in the Developing World* (pp. 39–52). Emerald Publishing Limited.
- Parnell, S., & Robinson, J. (2012). (Re)theorizing Cities from the Global South: Looking Beyond Neoliberalism. *Urban Geography*, 33(4), 593–617. <https://doi.org/10.2747/0272-3638.33.4.593>
- Ramsar. (2018). *Urban wetlands: prized land, not waste land*.

- https://www.ramsar.org/sites/default/files/documents/library/wwd18_handouts_eng.pdf
Ramsar Convention on Wetlands. (2018). *Scaling up wetland conservation, wise use and restoration to achieve the Sustainable Development Goals*.
https://ramsar.org/sites/default/files/documents/library/wetlands_sdgs_e_0.pdf
- Razali, M. N., Yunus, N., Lee, J., & Mei, Y. (2017). Sustainable property development by Southeast Asian property companies. *Property Management*, 35(1), 109–126.
<https://doi.org/10.1108/PM-01-2015-0004>
- Ren, J. (2015). Gentrification in China? In L. Lees, H. B. Shin, & E. Lopez-Morales (Eds.), *Global Gentrifications: Uneven development and displacement*. Policy Press.
- Rigolon, A., & Collins, T. (2023). The green gentrification cycle. *Urban Studies*, 60(4), 770–785.
<https://doi.org/10.1177/00420980221114952>
- Schoneveld, G. C. (2017). Host country governance and the African land rush: 7 reasons why large-scale farmland investments fail to contribute to sustainable development. *Geoforum*, 83, 119–132. <https://doi.org/10.1016/j.geoforum.2016.12.007>
- Smith, N. (2002). New Globalism, New Urbanism: Gentrification as Global Urban Strategy. *Antipode*, 43(3), 427–450.
- Soz, S. A., Kryspin-Watson, J., & Stanton-Geddes, Z. (2016). *The Role of Green Infrastructure: Solutions in Urban Flood Risk Management*. World Bank.
https://www.unwater.org/sites/default/files/app/uploads/2018/12/SDG6_SynthesisReport2018_WaterandSanitation_04122018.pdf
- The Rights and Resources Initiative. (2015). *Who Owns the Land in Africa?: Formal recognition of community-based land rights in Sub-Saharan Africa*. https://rightsandresources.org/wp-content/uploads/FactSheet_WhoOwnstheWorldsLand_web2.pdf
- United Nations. (2018). *Sustainable Development Goal 6: Synthesis Report on Water and Sanitation 2018*.
https://www.unwater.org/sites/default/files/app/uploads/2018/12/SDG6_SynthesisReport2018_WaterandSanitation_04122018.pdf
- Weise, K., Hedden-dunkhorst, B., & Wulf, S. (2021). *Using Satellite Images for Wetland Management and Planning in Africa: A Handbook for Wetland Managers and Practitioners*. Bundesamt für Naturschutz (BfN). <https://www.bfn.de/sites/default/files/2021-10/Skript613.pdf>
- Wetlands International. (2015). *Wetland solutions for people and nature: Strategic Intent 2015 - 2025*. <https://www.wetlands.org/publications/strategic-intent-2015-2025/>
- White, R., Turpie, J., & Letley, G. (2017). *Greening Africa's Cities: Enhancing the relationship between urbanization, environmental assets and ecosystem services*.
- Wilkinson, S., Dixon, T., Miller, N., & Sayce, S. (2018). *Routledge Handbook of Sustainable Real Estate* (S. Wilkinson, T. Dixon, N. Miller, & S. Sayce (eds.)). Routledge.
- Wilkinson, S., Sayce, S. L., & Christensen, P. H. (2015). *Developing Property Sustainably*. CRC Press.
- Wong, K. M. G. (2004). Vertical cities as a solution for land scarcity: the tallest public housing development in Singapore. *Urban Design International*, 9, 17–30.
<https://doi.org/10.1057/palgrave.udi.9000108>
- Xu, T., Weng, B., Yan, D., Wang, K., Li, X., Bi, W., Li, M., Cheng, X., & Liu, Y. (2019). Wetlands of International Importance: Status, Threats, and Future Protection. *Environmental Research and Public Health*, 16, 1–23.
- Yaro, J. A. (2010). Customary tenure systems under siege: Contemporary access to land in Northern Ghana. *GeoJournal*, 75(2), 199–214. <https://doi.org/10.1007/s10708-009-9301-x>