

Kugbega, Selorm Kobla; Aboagye, Prince Young

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RESEARCH

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Farmer-herder conflicts, tenure insecurity and farmer's investment decisions in Agogo, Ghana

Selorm Kobla Kugbega^{1*}  and Prince Young Aboagye²

* Correspondence: selorm.kugbega@keg.lu.se

¹Department of Human Geography,
Lund University, Geocentrum 1,
Sölvegatan 10, 22362 Lund, Sweden
Full list of author information is
available at the end of the article

Abstract

Owing to climate change, population growth and tenurial changes, the past decade has witnessed high interest among migrant and settler pastoralist groups in the vegetal-rich customary lands of the Agogo Traditional Area. This has resulted in lease grants of large land areas to pastoralists by traditional authorities and usufruct families, for reasons of ensuring optimum use and gaining the highest returns from lands. This paper examines the implications of consequent competing interests over land resources between farmers and herders on indigenous farmer's agricultural investment decisions. The study uses qualitative methods and empirical evidence is given by primary data from semi-structured interviews and focus group discussions in the case study area. Results indicated that land owners exploit lapses in customary land administration systems to allocate lands in exchange for money, to pastoralists while neglecting indigenous farmers' land use rights. Thus, indigenous farmers report land tenure insecurity and a sense of deprivation from their customary lands. Despite tenure insecurity concerns, farmer's agricultural investment decisions remain unchanged because such changes in investment decisions may reduce incomes and compromise their livelihoods. The findings herein contradict theoretical expectations and provide new perspectives for understanding the relationship between tenure (in)security and investment decisions.

Keywords: Agogo, Land tenure (in)security, Usufructs, Pastoralists, Customary land

Introduction

Barriers to agricultural productivity in Sub-Saharan Africa (SSA) have commonly been evidenced in poor soil quality, over reliance on rain-fed agriculture, poor market accessibility, inadequate inputs, low levels of mechanisation and reliance on obsolete agricultural knowledge in a fast-changing world (World Bank 2008; Binswanger-Mkhize 2009; FAO 2009). More topical in recent times however is the limited access to land and poor tenure security attributable to increases in rural land commodification¹ (Schoneveld et al. 2011; White et al. 2013; Kansanga et al. 2018). While using theoretical

¹Rural land commodification in this instance follows the definitions of Amanor (2010) and Yaro (2012) to denote the act of recognizing land and associated use rights as tradeable commodities central to the process of capital accumulation.

conceptions of primitive accumulation (Marx 1961) and accumulation by dispossession (Harvey 2004), the critical literature on land grabbing is replete with recurrent cases of rural land dispossession, commodification and consequent livelihood implications. The recent focus on land grabbing has shifted attention away from equally consequential rural land contestations arising from traditional mechanisms of crop and livestock production. Specifically, rural land demands have been influenced by the heightened demand for pasture by pastoralists who migrate towards hitherto uncharted parts of the forest and coastal zones of Sub-Saharan Africa in search of water and pasture (Tonah 2002a; Tonah 2006). The migratory herding patterns of pastoralist tribes including the *West African Fulani and East African Masai*, coupled with land-grabbing effects (see Schoneveld et al. 2011; Scoones et al. 2013; White et al. 2013; Boamah 2014b; Kansanga et al. 2018), increases in cattle herds and persistent reductions in vegetation cover in the arid and semi-arid regions has forced many herders to seek alternative grazing lands in the vegetal-rich forest and transition zones of Sub-Saharan Africa (Boonzaier 1987; Bonfiglioli 1992; Bonfiglioli 1993; Bennett et al. 2013).

The consequent pressure on land and water resources in the transition and forest zones of Sub-Saharan Africa has led to increased competition among traditional user groups—*farmers on one hand and herders on the other*—and poses challenges to customary land tenure² security. Cotula et al. (2006) posit that smallholder farmers' customary land rights, defined by their indigeneity to the land-holding community, are especially threatened by increased competition and demand for land by pastoralists. Continuous land contestations create tenuous relations among competing use groups; degenerating into conflicts (Turner 2004). For example, competing use rights to land has historically degenerated into conflicts in parts of northern Nigeria, Mali, Chad, Ghana and between the Nuer and Dinka ethnic groups in South Sudan (see Bennett 1991; Blench 1996; Blench 2004; Turner 2004; Benjaminsen et al. 2009; Abubakari and Longi 2014). Competitions over land between farmers and herders brings into focus debates on market and non-market-based customary tenure. Primarily, customary land tenure is non-market based hence ownership is secured through conquest, occupation, usufructuary access, inheritance, customary gifts and customary licenses (Lambrecht and Asare 2016). The non-market customary tenure system has been praised for its advantage of securing tenure verified by communal knowledge of asset use, occupation, ownership and distribution (Kasanga and Kotey 2001). It is further lauded for its egalitarian quality and comparative capacity to efficiently distribute land resources to all segments of land users (Juul and Lund 2002). In contrast, the introduction of formal and informal market systems within customary tenure is underscored by monetary considerations; a phenomenon described by Goldstein and Udry (2008) as “the monetization of customary land tenure”. Commodification of customary tenure through market processes encourages the individualisation and consequent privatisation of land rights (Besley 1995; Chimhowu 2019); a development which is in sharp contrast to the definitive communal characteristics of customary land ownership.

In Ghana, the dual operationalisation of market and non-market tenure domains in customary land allocation increases competition, creates overlapping land use rights

²Customary land tenure involves the administration of communal land in accordance with the tenets of customary law which emanates from the norms, customs and traditions of a group of people with common ancestry.

and encourages tenure insecurity. Notably, the dynamics of a hitherto non-market spatiotemporal land tenure among pastoralists is changing to accommodate market-based leasehold rights for purposes of creating livestock pasture reserves to support dry season grazing (Tonah 2002b; Tonah 2006). This practice has created discontent among usufruct farmers primarily because traditional authorities do not seek prior community consent when demarcating land for use by pastoralists (Kuusaana and Bukari 2015; Kuusaana 2018). Thus, the once complementary use rights between farmers and herders, characterised by livestock grazing on crop remnants after the planting season, have degenerated from a state of symbiosis to one of discord (Tonah 2005; Kuusaana and Bukari 2015). In Agogo, a community located in the central plains of Ghana, the contestations between farmers and herders stem from use right ambiguities between usufruct farmers whose ownership and use entitlements to customary lands are embedded in non-market claims of indigeneity and pastoralists whose claims are grounded in market-based tenurial rights (usually long-term leases). The question of whose land rights supersede the other in such parallel tenure domains remains unanswered. This degenerates into tenure insecurity and contestations for survival by either group. Despite the inherent fluidity and dynamism of customary land tenure systems in adjusting periodically to changing trends (Berry 1993; Berry 2009), it has been unable to efficiently solve land tenure insecurity problems. It has especially failed in reconciling the multiple and overlapping rights over land between smallholder crop farmers and agro-pastoralists. With over 80% of Ghana's land area administered under customary land tenure arrangements, (Kasanga and Kotey 2001) and 40.65% of the population engaged in agriculture (World Bank 2019), farmer-herder conflicts and associated threats to land tenure security may compromise the livelihoods of smallholder farmers (Bennett 1991; Tonah 2002a; Benjaminsen et al. 2009), discourage farmland investment and reduce agricultural productivity (Besley 1995; Cotula et al. 2006; Cotula and Vermeulen 2009).

This paper investigates how tenure insecurity arising from competing claims over land between farmers and herders affects farmer's farmland investments and patterns of production in the Agogo Traditional Area (ATA). Issues of customary land commodification, livelihood contestation and farmer's coping strategies are explored further in relation to spatiotemporal causes of tenure insecurity. The contribution of this paper lies in the research gap on perceived tenure insecurity created as a periodic phenomenon (3–4 months per annum) due to high in-migration of herders and the investment decisions farmers make in the light of such periodic experiences of tenure insecurity. The study becomes more relevant as the government of Ghana in 2019, after several failed militarisation attempts to flush-out pastoralists from Agogo, is considering policy initiatives to create dedicated cattle routes, ranches and grazing zones to accommodate registered pastoralists in the unoccupied and uncultivated plains of Agogo. This paper is structured in five sections. The first section presents the contextual background; the "[Land tenure and administration in Ghana](#)" section focuses on literature review of customary land tenure, land tenure security, pastoralism and farmer-herder conflicts in Ghana; the "[Theoretical aspects](#)" section presents the theoretical framework to guide the analytical focus of this paper; "[Methodological considerations](#)" section describes the methodological aspects of the study including data collection, data analysis and contextualisation of the case study area; the "[Results and discussions](#)" section discusses relevant findings and draws conclusions.

Land tenure and administration in Ghana

Land administration is the totality of all processes including record keeping and information sharing, that ensure the social and legal recognition of land rights (UN 1996). Ghana operates a bimodal system of land administration comprising customary and statutory land tenure (Ubink and Amanor 2008; Ubink and Quan 2008). Statutory land tenure relates to land vested in the state to be held in trust for the land-holding community or such land acquired for public purposes through the state's power of eminent domain as allowed by Article 257 of the Constitution of Ghana (1992) (Constitution of the Republic of Ghana 1992; Da Rocha and Lodoh 1999). Land acquired by the state to serve public purposes reverts back to the original land-holding group after such public purpose has been served or when the intended public use does not materialise. Conversely, Cotula and Chauveau (2007) define customary land tenure as emanating from customary law which is a set of undocumented, yet socially recognised laws grounded in the traditions, culture, norms and customs of a group of people defined by common lineage. Due to the differences in customs and traditions of different societies, customary law largely varies from one society to another and cannot be applied in a uniform manner across a geographical space of different cultures and ethnicities. Kasanga and Kotey (2001) note that about 20% of Ghana's land area is administered under statutory land tenure and held by the state while 80% is administered under customary land tenure. Interests in customary land as allowed by Articles 257, 265 and 266 of Ghana's Constitution (Constitution of the Republic of Ghana 1992) and defined by Ollennu (1962), Asante (1965) and da Rocha and Lodoh (1999) include the allodial title, freehold interest (customary freehold and common law freehold), leasehold interest, share tenancies and licenses (see Table 1).

The allodial title is the highest interest in land from which all other rights and interests are derived (Da Rocha and Lodoh 1999). It is usually held in trust by chiefs who act as fiduciaries or executive functionaries (by virtue of their occupancy of stools or skins), earth priest or Tendaana³, clans and families. In many instances, the primary allodial title holders devolve administrative powers to institutional subordinates (sub-chiefs, clans, families) who are entrusted with the responsibility of administering the sub-allodial title characterised by managing sub-parcels of the territorial range of the allodial title. The fiduciary role in customary land administration is recognised by Article 36(8) of the constitution of Ghana which stipulates that "Ownership and possession of land carry a social obligation to serve the larger community and, in particular, the State shall recognise that the managers of public, stool, skin and family lands are fiduciaries charged with the obligation to discharge their functions for the benefit respectively of the people of Ghana, of the stool, skin, or family concerned"(Constitution of the Republic of Ghana 1992). While detailing the mechanisms of what constitutes a charge of social obligation emphasised by Ghana's constitution, section 45 of Ghana's Chieftaincy Act, 2008 (Act 759) posits that all decisions of land disposal by traditional authorities need to be made with the consent of the lands commission and traditional council concerned (Chieftaincy Act 2008).

³Tendaana literally means land owner, and it pertains to the northern regions of Ghana where the Tendambaa or first settlers retain the allodial title over the land while serving as the spiritual custodian or earth priest who bridges the gap between citizens and the earth deity.

Table 1 Interests in land in Ghana

Interest/right	Duration	Primary custodian	Reason	Coverage/range
Allodial	Infinite	Chief, tendanaa, clan, family	Fiduciary/custodian role	All customary lands within geographical boundaries of chieftancy, earth priest/tendanaa, family or clan institution
Sub-allodial title	Infinite	Sub-chief, clan, family	Subordinate Fiduciary/custodian role	All subdivided land within territorial jurisdiction of sub-chief
Customary freehold	Infinite	Usufructs/ indigenes	Membership of community through lineage	All lands allocated, occupied and actively cultivated by usufructs
Common-law freehold	Infinite	Any individual or group with whom a freehold purchase agreement was reached before promulgation of the fourth (1992) republican constitution of Ghana (families, individuals, corporate organisations)	Assignee	Territorial boundaries of purchased land
Leasehold	Maximum 99 years (renewable)	Any individual or group with whom a lease agreement was reached (families, individuals, corporate organisations)	Lessee	Territorial boundaries of leased land
Customary cash/share tenancy	Renewable seasonally/yearly/after payment of agreed fee/share of farm produce to land owner	Any individual or group with whom a rental agreement was reached (families, individuals)	Tenant	Territorial boundaries of leased lands
Customary license	May be infinite, time bound or renewable in consonance with provisions of the license agreement	Any individual or group with whom a license agreement was reached (families, individuals)	Licensee	Specific use rights with varied territorial access.

Source: Authors' Illustration based on Ollennu (1962), Bentsi-Enchill (1964), Asante (1965), Constitution of the Republic Of Ghana (1992), Woodman (1996), da Rocha and Lodoh (1999)

The customary freehold (usufructuary interest) which is the near maximal interest derived from the allodial title is usually held by individuals and families that are subjects of the chief, earth priest or clan vested with the allodial title (Ollennu 1962; Asante 1965). It arises from allocation by the custodian of the allodial or sub-allodial title or through cultivation or occupancy of vacant communal land by usufructs. Thus, by virtue of citizenship and social belonging, usufructs enjoy an inalienable right to land which cannot be contested by the allodial title holders unless such land is required for public purposes (Ollennu and Woodman 1985; Da Rocha and Lodoh 1999). The usufructuary interest features customary co-ownership of land among individual and sub-groups that make up the community. It further comprises an infinite right of exclusive land use and an inherent right of bequeathal from older to younger generations. However, disposal of the freehold interest in the land (a) cannot be customarily executed without the express consent of the allodial title (Ollennu 1962) and (b) is statutorily prohibited by the Constitution of Ghana (Constitution of the Republic of Ghana 1992). Nana Sir Ofori Atta (paramount chief of Akim Abuakwa, 1912–1943) while opining that “land belongs to a vast family of whom many are dead, a few are living and countless host are still unborn (Quoted in Ollennu 1962:4) succinctly captures the intergenerational aspects of customary land tenure and the associated centrality of the usufruct family unit.

In addition to exercising primary territorial control over all unoccupied lands and shared resources including forests and rivers, the allodial title reverts to itself all idle lands including such lands abandoned after occupation or cultivation by usufructs. While noting this, Sarbah (1968:66) opined that “according to the native ideas, there is no land without owners. What is now a forest or unused land will, as years go on, come under cultivation by the subjects of the stool or member of the village, community or family”. Usufructuary rights have also been historically bestowed by fiduciaries on strangers who are not original citizens of the land-holding community but have been accorded customary citizenship status arising from long occupancy, servitude of stool/skin/family/clan or other agreements (Ollennu 1962; Asante 1965; Ollennu and Woodman 1985). The consequent common-law freehold also known as the stranger customary freehold is similar in vesting near-absolute interests in land in an individual or group. However, the interest is usually granted to strangers⁴ whose rights often emanate from market-based dealings. The major difference between customary and common-law freehold interests is that land is claimed by virtue of birthright, citizenship status and social identity among usufructs while strangers (holders of common-law freehold) claim interests through market dealings involving payment of valuable consideration (Ollennu 1962).

The leasehold interest primarily developed with the advent of statutory land tenure (Woodman 1996). It is characterised by a contractual agreement to use land in exchange for an agreed rent, granted by the allodial title or freeholder. It involves the acquisition of land parcels for specified purposes over an agreed time period, usually a period of 99 years⁵ for residential purposes among Ghanaians and 50 years for

⁴A stranger in the context of customary law is an individual or persons who are not citizens of the land-holding community by virtue of lineage and family claims.

⁵The common lease period of 99 years emanates from statutory practices of land registration in Ghana; however, no legislation in Ghana limits leasehold interests to 99 years for Ghanaians. The administration of lands act however limits leases for commercial and agricultural land uses to 50 years.

foreigners, commercial and agricultural land uses (Administration of Lands Act 1962; Constitution of the Republic of Ghana 1992). A valid lease agreement includes contractual details specifying the land parcel, parties, valuable consideration, period of lease, terms and conditions of lease and signatures of contracting parties and witnesses. The land reverts back to original land owners upon expiry of the lease period or may be subject to renewal. Unless expressly prohibited, the primary leaseholder reserves the right to sub-let leasehold rights in land to third parties for a period not exceeding the expiry date of the original lease and in consonance with its terms. Leasehold interests do not exist in customary law, instead, customary tenancies devolve from the usufructuary and allodial title (Da Rocha and Lodoh 1999). Customary tenancies allow tenants use rights to land for specified purposes over definite or unspecified periods of time. They are inheritable and require continuous recognition of the allodial or usufructuary title. They may arise from mutual agreements where landlords create gratuitous tenancies to ward-off land encroachers or when tenants initiate cultivation agreements with landlords. Broadly, customary tenancies may be gratuitous (customary licenses) or consideration-based (cash/share tenancy).

Customary license

Customary licensees reserve the right to use land without payment requirements (Woodman 1996; Da Rocha and Lodoh 1999). The interest merely comprises a right to beneficial use of property by the licensee: a feature that reinforces the altruistic qualities of customary tenure. Such licenses may be granted to friends, family or strangers who may exercise primary or secondary use rights over land. A common example of customary licenses is the stranger license (Da Rocha and Lodoh 1999) which allows migrant farmers and in some cases, pastoralists (Lengoi-boni 2011) the right to periodic land use as long as the licensee recognises the title of the licensor, does not bring adverse claims of ownership and does not violate the terms of the license. Though the customary license does not charge market rents for use of land, it is characterised by periodic in-kind gifts as a sign of homage and recognition of the land owner's title. In customary law, licenses are inheritable but may not transform into proprietary rights regardless of the history or length of the agreement (Bentsi-Enchill 1964; Woodman 1996; Da Rocha and Lodoh 1999). They are further conceived as weaker interests because the licensor reserves the right to revoke the licensee's use rights at any time.

Customary cash/share tenancy

Woodman (1996) conceives that all cash/share tenancies evolved from earlier licenses where land owners did not charge rents for land use. With increasing land demands and associated scarcity of the fixed resource, the hitherto gratuitous arrangement has changed markedly to incorporate market rents (Da Rocha and Lodoh 1999). Cash/share tenancy denotes an agreement usually for farming purposes on a seasonal or annual basis where the landlord agrees to rent land to the tenant with conditions of receiving either agreed cash payments or proportions of farm harvest (Blocher 2006). The former, also known as cash tenancy, is

preferred by wealthier households who favor paying cash for seasonal or annual land rental rather than sharing farm harvest with the landlord. The latter, involving in-kind payments of proportions of farm harvest after cultivation, is known as customary share tenancy and is the most common form of customary tenancy. Though varied in proportions of farm proceeds payable to landlords, most agreements in the Akan areas of Ghana require the payment of a third (*abusa*) or half (*abunu*) of proceeds to land owners (Ollennu 1962; Asante 1965). The agreement by both parties on the responsibilities of farm cultivation is a definitive factor in negotiating the proportion of farm produce shared between landlord and tenants. Commonly in *Abusa* (1/3 of harvest), land owners prefer to exact returns only for the lease of land to share croppers hence the tenant cultivates the farm with his/her own effort and finances. However, it is not uncommon for land owners to commit to land preparation, seed provision and finance while the sharecroppers perform all other management functions in which instance, *abunu*—half of the harvest—is considered fair (Degraft Johnson 1955; Josiah-Aryeh 2005).

Market/non-market land tenure

Tenure administration in Ghana comprises market and non-market dealings within both customary and statutory tenure regimes.

Customary tenure

In customary law, land acquisition predominantly takes place in non-market dealings including settlement, gifting, inheritance, customary allocation and borrowing. These allocations are mostly done without documentation of allocations and the boundaries thereof (Lambrecht and Asare 2016). Instead, land transfer is evidenced by customary ceremonies where witnesses are entrusted with the obligation of maintaining mental memories and passing on knowledge of the transfer to succeeding generations. The reliance on oral evidence coupled with fading memories, death of witnesses and distortions in reporting creates frequent contestations over land ownership (Bentsi-Enchill 1964). Though predominantly non-market based, customary tenure adopts a market-based feature in dealings with strangers and non-citizens typically through share tenancy agreements. Chimhowu and Woodhouse (2006) theoretically proves the existence of functional land markets within customary tenure that do not entail the establishment of *dejure* property rights. They find that vernacular land markets without formalised statutory documentation have historically existed and shaped land tenure relations between land owners and strangers. Additionally, tenure individualisation which is a definitive feature of market-based land tenure is primarily absent in non-market customary tenure. Baland and Platteau (1997) explain that when land resources are abundant, little regard is given to division of tenure and individualisation. As resources become scarce, there is a higher likelihood for division and individualisation because its benefits far outweigh the cost of communal governance (Besley 1995). Nonetheless, Kasanga (1988) warns that individualisation is not a totally alien concept to customary tenure. Instead, individualisation in customary tenure adopts a fluid nature, comprising active individualised tenure recognition during the planting period after which the land reverts to communal use (Kasanga 1988; Kasanga 2002).

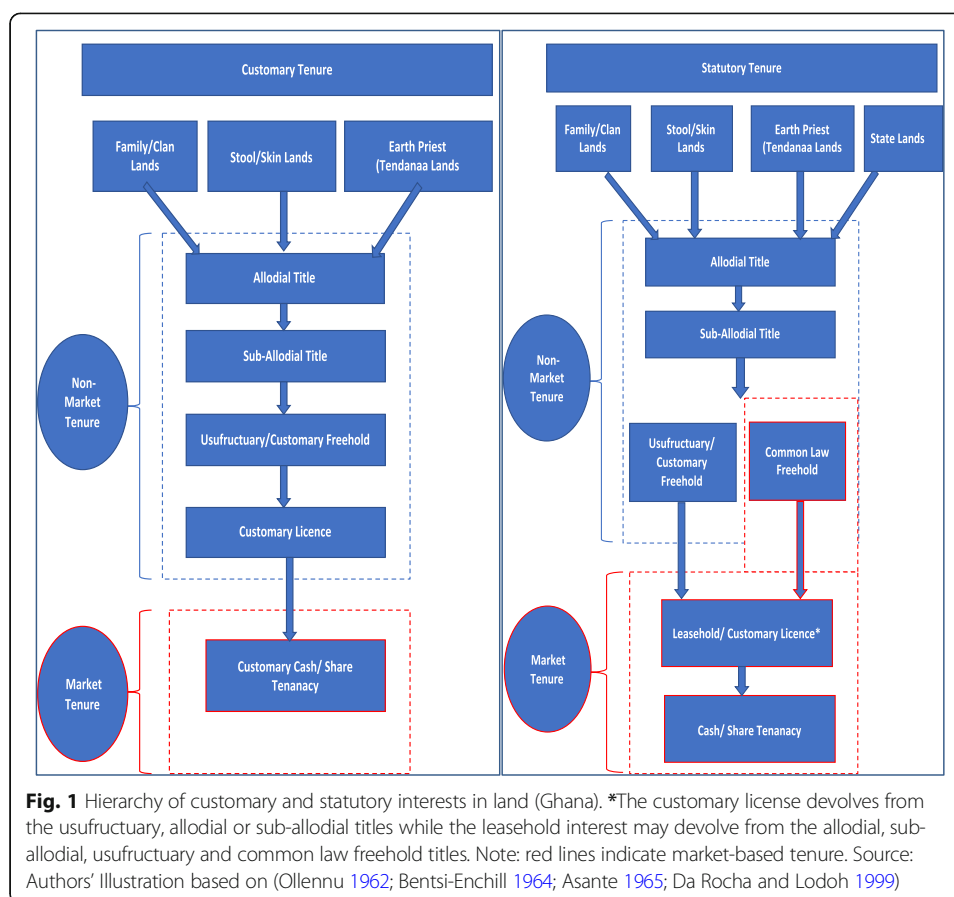
Statutory tenure

The inherent documentary deficiencies of customary land tenure necessitated statutory formalisation of tenure as a mechanism for guaranteeing ownership (Kasanga and Kotey 2001). Statutory legislations in Ghana recognise all interests under customary law and additionally introduces the leasehold interest, which is alien to customary systems (Woodman 1996). It precludes communal land access and introduces the tenets of tenure individualisation, privatisation and division of communal land rights. Regardless of the advantages of individualised tenure, Plat-teau (1996) recognises that statutory tenure suffers from problems of inequity where property rights are concentrated with rich and powerful individuals. Individualisation further fails to recognise multiple and secondary rights that serve as safety nets for the poorest groups including access rights by pastoralists, rights to collect fuelwood, mushrooms and wild fruits (Barrows and Roth 1990; Toulmin and Quan 2000). In Ghana, statutory law protects property rights through the deed and land title registration systems, respectively, safeguarded by the Land Registry Act (1962 Law [Act 122]) and the Land Title Registration Law (1986-Provisional National Defence Council Law [PNDCL] 152). While deed registration connotes the statutory registration of a transaction for transfer of land, land title registration involves registration of interests in the land, secured by the state (Agbosu 1990). Title registration involves processes of cadastral mapping, gazetting and the award of a land title certificate as proof of land ownership for the registered period. Though statutory tenure recognises several interests in land, the allodial, sub-allodial and customary freehold are non-market based while the common law freehold, leaseholds and cash/share tenancy arise from market transactions. See Fig. 1

Spatiotemporal land rights and farmer-herder conflicts in Agogo

Pastoralism is common in the arid and semi-arid zones of West Africa. The agro-climatic condition of the zone is conducive for supporting livestock rearing due to the availability of vegetal resources during the rainy seasons and the ability to easily fight or avoid common livestock diseases. Indigenous pastoral tribes who traditionally rear livestock on a free-range and migratory basis have existed in Africa for centuries (Blench 1994). In West Africa, the Fulanis⁶ are the largest ethnic group engaged in pastoralism and in Ghana; they were among the first settlers in the Northern Savannah Ecological Zone (NSEZ) (Tonah 2006). Traditionally, pastoralists land tenure rights are rooted in customary law; hence, their land rights are held under communal tenure arrangements (Migot-Adholla et al. 1991; Lengoiboni 2011). These rights are based on a complementary relationship for reciprocal use of land resources between pastoralists and farmers; creating resource sharing expectations (Meinzen-Dick et al. 2005; Lengoiboni et al. 2010). Pastoralists land rights have been described as spatiotemporal since they apply across different geographical spaces in time (Lengoiboni 2011). Thus, their land rights are characterised by temporal qualities of spatial coverage and duration. Spatiotemporal land rights are also termed as seasonal licenses or tenancies and relate to pastoralists due to their migratory

⁶Fulani's are largely categorised into two groups: cattle owners or cattle herders.



pattern of livestock production (Lengoiboni et al. 2010). Thus, pastoralists may traditionally hold land rights across a wide geographical area however such rights are only valid (a) during certain time periods within the livestock production year and (b) when the terms of the licenses or tenancies are adhered to. Generally, pastoralists tend to hold stronger use rights in the arid and semi-arid regions that traditionally support free-range livestock production (Tonah 2006). They settle in these arid and semi-arid zones, construct their homestead and tend to livestock for longer periods of the year, depending on the rainfall patterns in and around the zone (Oxby 1984; Xiao et al. 2015). Meanwhile, pastoralist activities in the transition and forest zones are minimal and historically limited to grazing during the dry seasons.

Conflicts between farmers and herders in West Africa are not new. Tonah (2006) notes that it predates colonialism; however, recent clashes were mainly noticed during the development of the cattle trade and the onset of the Sahelian droughts between 1960 and 1980. The Sahelian drought threatened the adaptive capacity of pastoralists to climate change in the arid and semi-arid regions of West Africa and forced many to move southwards to the rich forest and grassland plains of the south (Tonah 2005; Tonah 2006). Push factors of the Sahelian drought was compounded by growth in cattle numbers and farm expansion of indigenes resulting from the adoption of mechanised cultivation techniques (Tonah 2005). In Agogo, historical accounts of Fulani activities are marked by two distinct agreements in 1997 and 2006.

The first agreement with pastoralists

The earlier accounts of Fulani invasion were recorded in 1997 when four Fulani herdsmen petitioned the Agogo stool for access to grazing land on a temporal migratory basis. Through a customary tenancy agreement signed by Nana Kwame Nti (Krontihene⁷) and Nana Kwadwo Baah (Odikro⁸ of Abrewapong) on behalf of the Agogo Traditional Council, the herders were allocated grazing parcels in Abrewapong village, a suburb of Agogo with the following terms (Graphic Online 2017);

1. Compensation payments of one live cattle per herdsman per annum starting from year 1997
2. Animals will be prevented from destroying crops and personal possessions of local population in which case herdsmen will bear the full cost of the damage.
3. Any incidence of conflict will render the tenancy void.
4. Herdsmen will contact the traditional council for allocation to new sites or expansion of allocated sites when need arises.

Nonetheless, many farmers soon reported incidences of crop destruction and clashes with herders; a breach of two conditions of the customary tenancy. By 1999, Tonah (2002a) observed that competing interests over land encouraged farmers armed with guns, machetes and catapults to organise themselves into a local vigilante group with the singular motive to forcibly drive pastoralists out of the Agogo Traditional Area. The result was recurrent violent clashes between indigenous farmers and Fulani herders. The Agogo Traditional Council gave notice to herdsmen to leave Agogo by 5 February 1999 on account of breach of the agreed terms. Graphic Online (2017), however, reported that herders were reluctant to leave with many changing their production style from migratory to settler or sedentary pastoralism. The government of Ghana in an attempt to flush out herders from Agogo re-launched “Operation Cow Leg”. The operation Cow Leg was first introduced in 1988 to deal with the problems of “alien herdsmen”, mostly Fulani who are conceived as non-Ghanaians, by forcing them across the Ghanaian border and confiscating cattle (Department of State 1989). Similarly, the re-launched operation Cow Leg, comprising a joint military-police taskforce with support from other national security outlets, was aimed at using negotiation strategies and coercive force in ridding the Agogo Traditional Area of herders and ultimately pushing them out of Ghana. This expulsion strategy has been criticised by Atta-Asamoah and Aning (2012) to be in contravention of the ECOWAS Treaty on Transhumance Protocol (1998) which requires corporation on transhumance activities among member states.

The second agreement with pastoralists

In 2006, the Agogo Traditional Council and Nana Akuako Sarpong (paramount chief of Agogo), while citing economic development intentions, granted a grazing lease for 50 years to six Ghanaian cattle owners to rear cattle on a sustainable basis in Agogo. Each of the six cattle owners were granted 50 acres of grassland at

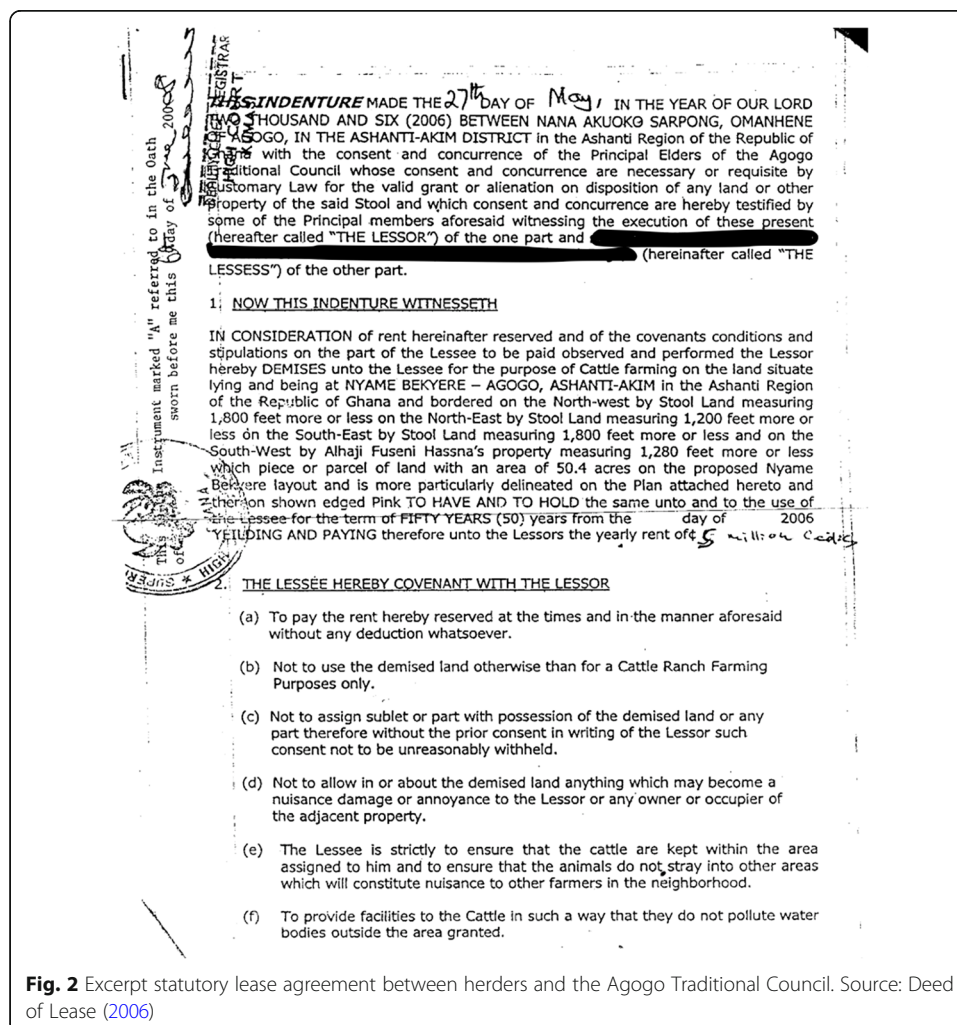
⁷Krontihene is the second in command to the paramount chief among the Ashanti's in Ghana.

⁸Odikro is the sub-chief, usually of a village

an annual rent of 5 million cedis (equivalent to 500 Ghana Cedis) payable to the Agogo Traditional Council with the following conditions (Deed of Lease 2006; Graphic Online 2017):

5. To pay the agreed rent
6. To use the leased land only for the purposes of cattle ranch farming
7. Not to assign or sublet any portions of the land without the consent of the lessor
8. Not to conduct any activity that may damage or become a nuisance to the lessor or occupiers of adjacent properties
9. Keep cattle within the leased area to prevent straying that may constitute nuisance to farmers
10. Provide watering facilities including wells to prevent pollution of shared water resources
11. Provide facilities for cattle in a manner that will encourage community cohesion
12. Any incidence of conflict and anti-social behaviours will render the lease voidable

See Fig. 2.



The grant of a statutory lease of customary land invited a new wave of Fulani activities in Agogo. Kuusaana and Bukari (2015) find that their reintroduction resulted partly from sublease agreements between the original lessors and non-Ghanaian Fulani herders. Conflicts re-emerged and in 2010, the government mandated a committee headed by James Dadson (Regional Lands Officer) to investigate the recurrent conflicts and make recommendations. The recommendations among other things included enforced cattle ranching, flushing out pastoralists who refuse ranching options and coordinated management of land grants to herders. In 2011, the Agogo Traditional Council having realised the breach of many lease conditions by herders, called for the voluntary removal of cattle by 29 March, 2011; a directive that was disobeyed by the six leaseholders (Graphic Online 2017). A further high court directive for removal of all cattle except such confined in ranches in the allocated zones was ordered on 20 January 2012. The directive reads

“The Court hereby issues mandatory injunction directed at the REGSEC [Regional Security Council], Ashanti Region, (and by implication the Regional Coordinating Council and the Executive branch of Ghana) to take immediate, decisive efficacious and efficient action to flush out all cattle in the following villages and localities in the Agogo Traditional AreaThose who rear the cattle must also do so properly. That means, confining the cattle and feeding them at the confined area. The time has come to end the nomadic cattle rearing tradition in this country. It sharply conflicts with the rights and activities of food crop farmers who constitute the majority” (Oduro and Others vs Attorney General and Agogo Traditional Council 2012:152)

This directive necessitated a re-launch of operation Cow Leg in Agogo in 2013 to remove all herders that did not have a valid lease and have failed to observe the covenants of the lease or both (Graphic Online 2017).

Theoretical aspects

Property rights and tenure security

Theories of property rights define the range of rights granted to individuals or groups over resources including land (Demsetz 1967; Libecap 1989). Its central ideologies of tenure exclusivity, individualisation and privatisation have incited a long and polarised debate on the place of customary tenure in the definition of property rights (see Baland and Platteau 1997; De Soto 2000; Platteau 2000; Toulmin and Quan 2000; Chimhowu and Woodhouse 2006). The principal theme of these debates can be reduced to the definitions of tenure (in)security which remains an enduring aspect of the definition of property rights. Van Gelder (2010) argues that tenure security incorporates three components including legal security (arising from formal titling), de facto security (arising from factors including long occupation) and perceived security (subjective beliefs of property rights). The prominent position on tenure security including such espoused by World Bank (2003) has been a focus on the legal security component of Van Gelder's (2010) definition. Tenure security arising from legal processes encourages individualisation of land through boundary clarification and the creation of property rights records to ensure tenure exclusivity (Deininger 2003; Obeng-Odoom and Stilwell 2013).

Similarly, De Soto (2000) concludes that privatisation and formalisation of land tenure increases tenure security and provides opportunity for leveraging on land assets as financial collateral. This legal focus has been described by Oya (2007) as a simplistic definition that attempts to utilise a market solution, based on the assumption of economic rationality, for poverty reduction through releasing the latent potential of what De Soto (2000) described as *dead capital*⁹. Beyond prescriptions of tenure security as legal, perceptive or factual, Obeng-Odoom and Stilwell (2013) extend the definition to cover legal, economic and social dimensions. While defining legal aspects as the relationships between owners, tenants and institutional actors, Obeng-Odoom and Stilwell (2013) relate social aspects to tenure security assured through communitarian land use, long occupation (UN-Habitat 2003) and spatial organisation of communities. Economically, they relate tenure security to privatisation of property rights such that they can be commodified (Obeng-Odoom and Stilwell 2013). While questioning the applicability of the evolutionary theory of land rights on African customary tenure, Platteau (1996) describes a linear and inevitable transition from communal to private property rights catalysed by demographic, economic and social factors. He argues that as population pressures on land increase and subsistence production patterns become commercialised, customary land tenure systems will become inefficient for ensuring tenure security and naturally replaced by a more efficient private property rights regime, safeguarded by state authority (Baland and Platteau 1997; Platteau 2000).

Payne (2004) notes the absence of an objective measure of tenure security and instead views the concept as a continuum of tenure where some individuals can claim higher rights to land than others. However, Besley (1995) defines land tenure security as the certainty that an individual or group's rights to exclusive use and enjoyment of land resources is safeguarded when challenged by adverse claims. Similarly, Migot-Adholla and Bruce (1994) and Goldstein and Udry (2008) observe that tenure is secure in the absence of existing and perceived land contestations and when an individual holds the exclusive right to reap the economic benefits of investments in land. These definitions convey a broader meaning of tenure security by differentiating formalised ownership rights (typically land titling) from use rights and right to recover investments in land (Lund and Benjaminsen 2001). The broader definition incorporates tenets of customary land administration that view tenure as social relations of resource use and further fits Polanyi's (1944) classification of land as a fictitious commodity which produces value through an intricate network of social relations rather than an exclusive market process.

Tenure security and investment

"If a farmer cannot look to the future with security, little can be hazarded by him beyond the expenses which the returns of the year will defray; and not only will all great improvements, but even the most common works of the season, be imperfectly performed" (Low 1844:9). The quote captures a prominent ideology of the property rights school which assumes the existence of a linear relationship between tenure security and the propensity to invest in land (Shipton 1989). It is perceptible that decisions to invest in land or otherwise are rooted in the probability of reaping some

⁹Dead capital relates to financial assets locked up in property that has not been collateralised

expected economic benefits secured by the nature of land rights held by the investor. The hypothesised relationship between property rights, tenure security and investment has received much attention among property rights theorists (see Besley 1995; Platteau 1996; Pagiola 1999). The basic assumption of the tenure-investment relationship is that a rational farmer considering to undertake farmland investments will compare investment costs with the present value of expected net returns. However, expected net returns are influenced by real or perceived probability of holding uncontested rights in land over a defined period. A higher real or perceived tenure security translates into higher expected net returns to investment.

Besley (1995) and Pagiola (1999) theorise that farmers that feel a higher degree of tenure security are more incentivised to invest in land through farm expansion, farmland improvement and cultivation of longer maturity cash crops. Conversely, when tenure security is threatened, farmers are likely to reduce their land cropping area (Besley 1995) and switch to cultivating early maturing crops (Pagiola 1999). Blarel (1994) finds that tenure secure farmers have an assurance of long-term land use and invest in short, medium and long-term farm improvements. Investments in land may be labour or capital-intensive comprising irrigation systems, fertiliser and input use, mechanisation and terracing. While the theorised relationship between tenure security and investment is logically appealing, empirical studies on the phenomenon remains inconclusive or contradictory. For instance, a study by Feder and Onchan (1987) in Thailand finds that tenure security increases farmer's investments in land. Similarly, Carter et al. (1994) in Kenya demonstrate a higher variance in return to investment on land with tenure secured through statutory title than land without title. The theorised linkages between statutorily secured tenure and investment may be challenged by the perceived risk of losing titled land; an indication that statutorily registered land may experience perceived tenure insecurity (Platteau 1996). Thus, evidence that statutory titling improves tenure security and investment in land while customary tenure does not, is inconclusive (Chimhowu and Woodhouse 2006).

Further, Migot-Adholla et al. (1993) observed that even though farmers who hold statutory titles are perceived to have secure tenure in Ghana, agricultural investment did not vary between farmers who have either privatised or communal land rights. Instead, farmers that hold temporal land use rights (typically customary tenancies) and transferable interests invested more in land. Likewise, Gavian and Fafchamps (1996) find no significant relationship between tenure security and investment in Niger. Meanwhile, Sjaastad and Bromley (1997) observed that farmers may enhance their claims to land when they feel tenure insecure by increasing their investment in land including erection of permanent structures, irrigation facilities and cultivation of long maturity economic trees (for example timber). Their empirical analysis showed a reversal of the perceived linear relationship between tenure security and investment by proving the paradoxical need for investment to ensure tenure security. They argue that "If one accepts that certain types of investment in land are a legitimate way of claiming more secure rights to land, and that investments may be recovered even when land is lost, the assertion that insecurity of land rights in indigenous tenure systems is a serious impediment to investment seems less convincing" (Sjaastad and Bromley 1997:553). Tenure security and investment linkages are context-specific and defined by varied financial,

cultural and socio-political factors (Goldstein and Udry 2008; Fenske 2011). Though a relationship exists from the theoretical explanations, empirical evidence is varied. The relationship is therefore one that needs to be constructed based on an empirical question that takes cognisance of contextual differentials rather than a theoretical investigation.

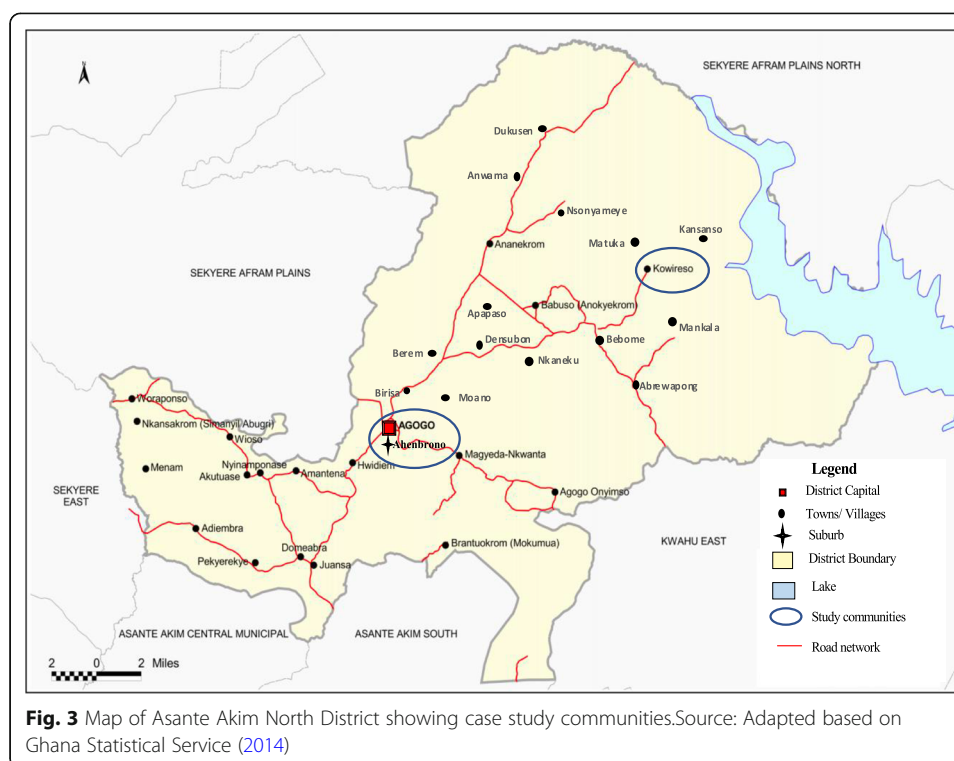
Methodological considerations

Study area—Agogo traditional area¹⁰

Agogo is the capital of the Asante Akim North district in Ghana, inaugurated in 2012. It is located along the eastern corridor of the Ashanti region and covers a geographical landscape of 1160 km² equivalent to 4.6% of the total land area of the Ashanti region of Ghana (Ghana Statistical Service 2014) (see Fig. 3). It is a predominantly rural district with a rural population of 53.5% and urban population of 46.5% (Ghana Statistical Service 2014). The area is dominated by the Akan ethnic group however, there are small pockets of settler non-Akan migrant farmers usually belonging to the Frafra, Mamprusi, Dagaaba and Dagomba ethnic groups. Traditionally, the district is administered by three paramountcies including the Agogo, Domeabra and Juansa paramountcies who collectively owe allegiance to the paramountcy of the Ashanti Kingdom of Ghana. The district population is estimated as 68,186 with 51.2% female and 48.8% male (Ghana Statistical Service 2014). The population structure of the district is predominantly youthful and middle-aged with 39.9% between ages 0 and 14, 54.8% between 15 and 64 years and 5.3% above age 65 (Ghana Statistical Service 2014). With a high proportion of economically active people, the major economic activity in the area is smallholder agriculture which employs 72.7% of the entire population (Ghana Statistical Service 2014). Major crops grown in the district are plantain, yam, rice, oil palm and vegetables while animal rearing constitutes 21.7% of agricultural production (Ghana Statistical Service 2014). Other economic activities include timber lumbering, carpentry, retail business and textile making. With low capacity for small-scale processing, manufacturing and industry, the district has vibrant local markets for wholesale of agricultural produce and onward transportation to the urban centres across Ghana.

Ecologically, the district falls within the moist semi-deciduous forest zone with 54.5% open forest area, 21.9% closed forest and 23.3% wooded savannah area (Ghana Statistical Service 2014). The area's undulating gentle slopes, wet-semi equatorial climate characterised by bi-modal rainfall (major and minor rainy seasons) and extensive grassland is conducive for supporting crop and livestock farming. Peak rainfall occurs between May and July and the minor rainy season starts from September to mid-November. The dry season sets in towards the end of the minor season and is between late November and

¹⁰The Agogo traditional area (ATA) denotes a geographical jurisdiction over which the Agogo paramount chief exercises customary land management rights. Rather than a political jurisdiction defined by the state, the land area of the Agogo Traditional Area is historically defined by the chieftaincy institution and may overlap with defined statutory jurisdictions. Thus, the Agogo Traditional Area spans parts of the Asante Akim North District and Sekyere Afram Plains district in Ghana (see Wallis 1953:18-22). In the context of this paper, both case studies are located in the Asante Akim North district; however, the activities of pastoralists are common in other areas of the Agogo traditional area that span beyond the Asante Akim North district. For the purposes of this paper, the Asante Akim North district (where both case studies—Agogo Ahenbrono and Kowireso are located) is put in focus. Meanwhile the authors found it important to indicate that the territorial reach of pastoralist activities cover the entire land area (Agogo traditional area) over which the Agogo paramount chief exercises his land custodianship duties.



March. It is also home to the Akwapim-Mampong range of ridges which serves as a watershed for several waterbodies including the major Oweri and Afram rivers that drain the district. The Agogo traditional area is relevant for the study due to its lush grasslands and drainage that serve as attractions to migrant Fulani pastoralists during dry periods in the Sahelian regions of West Africa. Furthermore, the widespread and long-lasting nature of farmer-herder conflicts in the area justifies the purposive selection of ATA (Flyvbjerg 2006).

Research design and site sampling

The research primarily uses what exists as facts (ontology) as a guide to unveil farmer's conception of a phenomenon (epistemology). Thus, it uses a social constructivist approach to investigate farmer's constructions of reality pertaining to perceived tenure security and consequent investment decisions. It sought to unveil the connections between theories and social processes (Creswell 2014). The study is explanatory in nature (Bryman 2016) as it seeks to examine how pastoralist's and farmer's competing land rights under customary law affects the investment decisions farmers make. This approach is in line with Saunders et al's (2009) definition of explanatory research design as a mechanism for determining how causal relationships explain a situation. The research also adopts a case study design in order to present a detailed contextual analysis of a social phenomenon and its causal relationships (Flyvbjerg 2006; Yin 2014). The study adopts a purposive sampling technique that helped in the selection of two farming communities in the Agogo traditional area out of a total of 15 where the activities of agro-pastoralists are reported to be rampant (see Graphic Online 2017; Bukari and Kuusaana 2018). The communities

identified are Kowireso and Agogo Ahenbrono. These two communities were chosen firstly because farmers experience similar concerns regarding threats to their land tenure and secondly to help ensure consistency, triangulate and validate data gathered.

Data collection

In qualitative data collection, it is imperative that several methods are used to seek multiple responses and to spot contradictory claims (Bryman 2016). The study uses a mixed qualitative methodology comprising in-depth individual interviews, key informant interviews and focus group discussions for eliciting data on individual's construction of their realities (Creswell and Creswell 2018). The use of different qualitative data collection methods helped to unveil a deeper understanding of the phenomenon under study and further served as methodological triangulation tools to corroborate the study findings. Semi-structured interview guides were developed to guide data collection. The interview guide aided in collecting data on farmer's land rights, farmer's perceptions of pastoralist's land rights, perceived tenure (in)security among farmers and the investment decisions they make in response to tenure insecurity concerns. Data was collected between February and March 2017. A reconnaissance study visit for purposes of identifying gatekeepers and key informants (Bryman 2016) was first conducted in February 2017. This process resulted in meetings with members of the Agogo Traditional Council, religious leaders, family heads, farmer cooperative leaders and the police. Due to sensitivity reasons and ongoing pastoralist flushing-out (militarisation) operations at the time of data collection, the district commissioner of police, paramount chief and some members of the clergy declined to comment. A total of 36 farmers were sampled for the individual semi-structured interviews, 27 farmers for FGD's and 8 persons for key informant interviews. The distribution of respondents is shown in Table 2 below;

Individual interviews

For individual semi-structured interviews, a list of farming households in Agogo was sought from the Asante Akim North district assembly. With the help of assembly members, the sample frame of farming households in the two case study communities was generated. The list revealed a total of 140 farmer households in the Agogo Ahenbrono community and 107 farmer households in the Kowireso community. While sampling 18 households in each community for the individual interviews, a simple mathematical formula denoted by total number of households divided by number of interviews needed, rounded up to the nearest whole number was used to select the "nth" household to be invited for interview. The sample size selection is informed by Bowen's

Table 2 Distribution of Respondents

Number of interviewees	Characteristics	Agogo Ahenbrono	Kowireso	Outside case study area
Type of interview				
Individual interviews	Indigenous crop farmers	18	18	0
Focus group discussions (number of participants)	Indigenous crop farmers	11	16	0
Key informant interviews	Community leaders and researcher	5	1	2

Source: Authors' Construction, Field Data (2017)

(2008) recommendation that a flexible sample size range needs to be chosen while conducting qualitative research and a finite number only adopted after data collection has reached the saturation point.

Focus group discussions

A total of four focus group discussions (FGD) of 6–8 participants (Mikkelsen 2005) with two per research community were conducted. Convenience and purposive sampling techniques were used in sampling FGD participants. With farmer-herder conflicts expected to be high and farmers avoiding farm activities at the time of data collection, this paper used convenience sampling techniques for conducting the first set of FGD's by interacting with farmers passing time leisurely in each of the two sampled communities. A second set of FGD's comprising purposively sampled individuals who are members of farmer cooperatives and leaders of farmer groups was conducted in each community. Purposive sampling of FGD participants helped to reach participants who had primary knowledge and experiences of tenure security issues associated with farmer-herder conflicts. The central themes of the FGD's focused on land ownership rights of farmers and herders, mechanisms for land access, farmer-herder conflicts, tenure security, cropping patterns and farmer's investment decisions. The FGD's complemented prior individual interviews and was important for eliciting group insights into perceived tenure security issues arising from pastoralist's activities. Farmers are often faced with a plethora of concerns including climatic conditions, product prices, market accessibility among others and subjects that they feel need to be given utmost consideration but are not the focus of the study (see Jacobsson and Åkerström 2013). In the peculiar case of Agogo, farmers were quick to point out the large-scale acquisition of land by transnational corporations; a phenomenon often described as land grabbing (White et. al 2013; Boamah 2014b; Bukari and Kuusaana 2018) and evacuation exercises by the forestry commission to prevent farmers from encroaching on protected forest lands. Thus, the authors, while permitting the deliberations to flow in an iterative manner moderated discussion in a way that prevents participants from totally veering off the topic of discussion.

Key informant interviews

Further, eight key informant interviews with community leaders and a researcher was conducted. An integrated purposive and snowballing sampling technique, adapted with further probing strategies to remove inherent biases of being referred to like-minded people, (Bryman 2016) were used in selecting key informants who have in-depth knowledge of the subject. To this extent, the researchers interviewed two members¹¹ of the Asante Akim North district assembly (one for each research community): one unit committee¹² member of the district assembly, one linguist¹³, one family head, one elder of the Agogo paramountcy, one sub-chief (Krontihene) of the Agogo paramountcy and one researcher who has published widely on farmer-herder conflicts in Ghana.

¹¹An assembly member refers to the politically elected leader of an electoral area of the district.

¹²A unit committee member is an elected executive member of the district assembly

¹³An elder in the traditional hierarchy of Agogo, who interprets the paramount chief's messages to community members

Data analysis

This paper uses content analysis and descriptive narratives for deductively evaluating empirical data. Recorded interviews were transcribed and supplemented by notes from field notebooks. Data was analysed using NVIVO qualitative data analysis tool for coding to show patterns of emerging and recurrent themes related to theory (Creswell 2014). The pattern coding identified similarities, frequencies, differences, categorisation and causation between descriptive codes (Saldana 2009). Primary data was further supplemented with secondary information from journal publications, reports and newspaper articles. A major constraint of the methodology adopted was a lack of gender representativeness. Women were mostly unavailable to comment due to their engagement in household chores upon returning from their farms and their exclusion due to traditional patriarchal restrictions on women assuming the responsibilities of the household head (including receiving guests) without permission from the male household head. In circumventing this, a deliberate purposive approach was used in ensuring at least 25% women interviewees (Scheyvens and Leslie 2000). Cumulatively, 12 women, 6 in each study community were engaged in the 36 individual interviews while 9 women were engaged in the FGD's comprising a total of 27 participants. Women's views comprised a third of data collected and this can be deemed adequate since the research has no highly weighted gender dimensions. For purposes of data stratification and detailed analysis, demographic data including age, sex and occupation(s) of respondents was collected (see Table 3).

Ethical considerations and limitations

When conducting sensitive research related to conflicts, it is important for the researchers to thoroughly explain the reasons for the research and seek the consent of respondents. Thus, consent forms detailing assurances of confidentiality and anonymity of data were prepared and explained before signing by respondents. Respondents were given the option to willingly participate in the research and withdraw at any time while questions were worded in a culturally sensitive manner to reduce anxiety. Respondents also did not include minors (under 18 years) and the researchers were careful to eliminate power imbalances by correcting respondent's notions of them as government officials or journalists since such notions could potentially skew narratives. Key informants consented to the use of their names and designation while pseudonyms are used for the remaining respondents in observation of the ethical rule to "do no harm". This was to prevent interviewees from being targeted by pastoralists or other disagreeing parties. Regarding its scope, it is difficult for the results of the research to be generalised to other areas because it is limited in geographical reach and context specific. However, the aim of the research is not to present results that can be generalised to the entire population or other communities but to elucidate individual perceptions that are unique and important in shaping the discourse on tenure security and farmer-herder conflicts. Thus, the selected sample size and data collected can only be indicative of the broader picture of the phenomenon and can help direct further studies.

Land tenure security as a concept is difficult to measure because it relates to farmer's perceptions and adopts a constructivist nature. Nonetheless, the study elicits information based on farmer's perception of tenure (in)security rather than the establishment

Table 3 Demographic characteristics of respondents: summary

Attribute/category	Individual interviews	FGD	Key informants	Total (% to 1 decimal point) ^a
Age				
20–30	2	0	0	2 (2.8%)
30–40	6	3	0	9 (12.7%)
40–50	15	15	2	32 (45.1%)
50–60	8	9	4	21 (29.5%)
Over 60	5	0	2	7 (9.9%)
Sex				
Male	24	18	8	50 (70.4%)
Female	12	9	0	21 (29.6%)
Education level (highest completed)				
Tertiary	5	—	4	9 (20.5%)
Secondary	1	—	2	3 (6.8 %)
Junior High school	7	—	0	7 (15.9%)
Primary	10	—	1	11 (25.0%)
No education	13	—	1	14 (31.8%)
Primary occupation				
Farmer	25	—	—	25 (69.4%)
Teacher	4	—	—	4 (11.1%)
Carpenter	2	—	—	2 (5.6%)
Lumbering (chainsaw operator)	0	—	—	0
Charcoal burning	0	—	—	0
Electrician	0	—	—	0
Hair dressing	0	—	—	0
Driver/bus conductor	2	—	—	2 (5.6%)
Trader	3	—	—	3 (8.3%)
Secondary occupation				
Farmer	11	—	—	11(30.5%)
Teacher	0	—	—	0
Carpenter	0	—	—	0
Lumbering (chain saw operator)	1	—	—	1 (2.8%)
Charcoal burning	1	—	—	1 (2.8%)
Electrician	1	—	—	1 (2.8%)
Hair dressing	3	—	—	3 (8.3%)
Driver/bus conductor	2	—	—	2 (5.6%)
Trader	3	—	—	3 (8.3%)
None	14	—	—	14 (38.9%)
Ancillary economic activities				
Labourer/casual work ^b (off-farm) in the past 3 years	22	—	—	22 (61.1%)
Labourer (on-farm) ^c in the past 3 years	0	—	—	0

^aPercentages pertaining to humans as used in the discussions section are rounded off to the nearest higher whole number.

^bRespondents considered casual work as an ancillary economic activity that they engage in when they take time off from their primary or secondary occupations. In this context, ancillary economic activities instead of being regarded as an occupation was viewed as, an often-used mechanism for livelihood support.

^cRespondents mentioned on-farm labour services as a last resort and intimated that it was instead common to find migrants usually from the northern regions of Ghana offering the service as their primary or secondary occupation.

Source: authors' construction, field data (2017)

of an objective measure based on identified indicators. Yin (2014) argues that oral reports may suffer problems of miscommunication and insufficient recollection. Hence, farmer's construction of perceived land tenure insecurity may be exaggerated, misleading and ascribed to different meanings related to their lived experiences. We however use iterative questioning where previously raised questions are rephrased to identify contradictions and methodological triangulation tools to verify information and report the commonly defined changes in farmer's investment in reaction to tenure insecurity. Finally, even though the research does not seek to take sides in the farmer-herder conflict, it is one-sided because it aims to reveal indigenous farmer's conceptions on tenure security and investment. Thus, pastoralists were not interviewed and their opinions are not represented. Nonetheless, these limitations did not affect the aim and objectives of this paper hence the results remain robust.

Results and discussions

Customary land administration in Agogo

Most lands in Agogo are managed under communal property arrangements where custodians of the Agogo stool (paramount chief, sub-chiefs and council of elders) act as fiduciaries who hold the land in trust for the community. The study confirmed that about 70% of the total land area of the Agogo Traditional Area is directly managed by the chiefs while the remaining 30% is held by usufruct families and the central government though the forestry commission (Kuusaana and Bukari 2015). The Agogo stool (paramountcy) thus holds claim to the allodial title which denotes the highest right in land from which all other rights are derived (Da Rocha and Lodoh 1999). Being the occupant of the stool, the final power to transfer land or otherwise rests solely with the paramount chief (*Omanhene*) with advice from his council of elders. This authority over land exercised by the paramount chief is exerted at the local level by community chiefs (*Odikro*) who control smaller spatial areas on behalf of the paramountcy. Community chiefs have the power to grant up to 5 ha of uncultivated stool land for usufruct cultivation while all land demands by strangers (non-usufructs) are handled by the paramount chief (Kuusaana and Bukari 2015). A 78-year-old elder of the Agogo Traditional Council acknowledged the land ownership rights of the Agogo paramountcy by remarking that "*He [Nana Akuoko Sarpong] is the paramount chief and he is the owner of the land but he allows us [his subjects] to also use the resource*" (Field Data, 2017).

Secondary to the allodial title are the usufructuary land rights (customary freehold interest) granted by the stool and held by usufruct families. These lands are held in trust by family heads who usually possess rich knowledge of the land boundaries and act in consultation with the family council to allocate parcels upon request to family members. Aside managing family land, usufruct families may lease or sublet land in consultation with the stool; however, they do not necessarily require express and prior consent of the stool before executing such agreements (Asante 1965). Despite the superiority of the allodial title, the paramountcy cannot exert any power to transfer family lands unless such land is required for public purposes (Asante 1965; Da Rocha and Lodoh 1999). Even so, the paramountcy is required to consult the family head and table a request for the use of land for the public purpose identified. Most indigenous

farmers in Agogo gained access to farmlands through family membership, inheritance of family land or allocation by chiefs. While affirming this notion, a male farmer in Kowireso remarked; *“I inherited my father’s farm land of about 30 acres when he died. I have not heard of an indigene here in Agogo who has bought land. If you ask your family head or community chief [Odikro] for land, he will give you after verifying your lineage, so that you can also farm and feed your family”*

Thus, land access by usufructs remains largely non-market based and they possess an inherent right of access to lands held by the paramountcy, yet the paramountcy reserves the discretion to allow or restrict such usufruct land use in favour of what may be customarily prescribed as public interest. The words of a 76-year-old family head in Agogo Ahenbrono, who stated that *“The land belongs to us. Our forefathers gave it to us and it has been held in the family for generations”* (Field Data, 2017), indicates that usufructuary land rights in Agogo are administered in accordance with the tenets of communal land tenure, which typifies land as an asset that is owned collectively by an identifiable group with a common ancestral heritage (Chimhowu and Woodhouse 2006). Meanwhile, due to the scarcity of stool and family lands, some usufruct farmers obtained lands outside their primary family unit through negotiable oral licences, renewable share cropping agreements with other usufruct families and taungya¹⁴ arrangements with the forestry commission of Ghana. Farmers related the preference for taungya, licences and share cropping arrangements to the difficulty in accessing arable stool lands, marginal nature of remaining stool lands, long distance from homesteads to newly allocated farm lands and the proximity of new allocations to the areas of the Agogo plains where activities of sedentary Fulani herdsmen is rampant all year-round.

Pastoralist’s land rights—from seasonal tenancy to statutory leasehold

Pastoralists may acquire land through agreements with the Agogo paramount chief and usufruct families who both have the discretionary right to grant customary land (see Andersen 2011). In Agogo, the *Krontihene* confirmed a grant of about 50 acres of land to Fulani herders in Abrewapong Village in 1997. Without statutory registration, this grant was considered a customary grazing tenancy for seasonal sustenance of cattle by migratory pastoralists (see *“The first Agreement with Pastoralists”* section) The tenure type (seasonal customary tenancy) was markedly different from the spatio-temporal customary licences that pastoralists held in the northern regions where they were not required to make any periodic payments nor obey explicitly defined covenants. The *Krontihene* intimated that the decision to agree to a customary grazing tenancy on a seasonal basis with Fulani herders in 1997 was underpinned by humanitarian factors because herders had been pushed out of their original grazing zones in northern Ghana as a result of recurrent tribal conflicts. Soon, migratory pastoralists having realised the lush vegetative cover in Agogo started to adopt a sedentary nature. The previous symbiotic relationship where herders were only present in Agogo after the planting season to graze in allocated zones and feed on crop remnants, changed markedly with some herders settling permanently and tending cattle throughout the planting season. More

¹⁴ Agroforestry farming system where farmers agree to tend forest trees in exchange for cultivating undergrowth.

specifically, this switch from migratory to sedentary pastoralism changed the once spatio-temporal and complementary land rights of herders to a competitive one. With increasing competition, farmer and herder groups developed hostile views of each other instead of being allies with shared interests. Many farmers in Abrewapong (community where the first four Fulani herders were granted grazing tenancies) and their environs reported cases of farm destruction by cattle; an indication that herders were in contravention of the covenants of the customary grazing licence. Even though dialogue, ultimatums, appeals, mediation by chiefs and other dispute resolution measures were sought, farm destruction remained rampant. This posed a threat to farmer's livelihoods leading to conflicts and a termination of the customary tenancy agreement by the Agogo Traditional Council on account of breach of covenants.

Nonetheless, in 2006, the Agogo Traditional Council considered a new agreement for a statutory lease of 190 acres of land to six (6) Ghanaian cattle owners (see [“The Second Agreement with Pastoralists”](#) section). Unlike the previous seasonal grazing tenancy which was underscored by humanitarian influences, the new lease agreements were aimed at stimulating economic development by harnessing the economic benefits of cattle rearing, including a vision to establish a meat processing factory to provide employment for the youth. Against this backdrop, a market-based transaction for grant of customary grazing leases characterised by monetary payments (drink money¹⁵) was agreed. An elder of the Agogo paramountcy, Wofa Nti-kyei, opined that most of these large-scale land transactions by the paramountcy are conducted secretly with selected members of the traditional council who do not oppose the chief's views or themselves have vested interests in the land transaction. He stated that *“Even though I am a key member of the traditional council, some of these land decisions are taken at a much higher level and I wasn't part of the group of elders and chiefs who took the decision to give our lands to the pastoralists”*. Thus, the decision to lease land to pastoralists occurs among the top executive functionaries of the allodial hierarchy.

Generally, major stakeholders including the Agogo traditional council and members of the local government assembly acknowledge the market-based rights of pastoralists to graze in the areas demarcated for their use. However, the reaction among farmers is mixed. Many farmers (60%) do not acknowledge that the Fulani pastoralists have any land rights in Agogo. Their notion on the perceived land rights of the Fulani is best captured by the statement of a member of the Kowireso farmer's cooperative. He remarked that *“we don't think the Fulani's have any rights in land here in Agogo. We are the indigenes and we are the ones who own the land by virtue of inheritance from our forbearers”*. Non-recognition of the land rights of pastoralists was high among farmers who have limited knowledge about the land transaction, duration of lease, land boundaries and covenants for use of the land. Meanwhile, community engagement and information sharing are important for establishing legitimacy, reducing contestations and ensuring accountability in land resource management. Other farmers (30%) agree

¹⁵Drink money pertains to the price customarily charged by land owners. Though previously regarded as a token payment, it has recently been described by Goldstein and Udry (2008) as valuable consideration that is equal to the purchase price of the land. Meanwhile, Asante (1969) advises against equating drink money to “purchase price” because such payment is required for customary services related to the land grant while the land itself is not sold.

that the grant of customary land by family heads and the paramount chief to cattle owners gives pastoralists the exclusive right to use the allocated lands. This view is elucidated in the words of Kweku Asante a 54-year-old farmer in Agogo Ahenbrono who noted that *“the land belongs to the Fulani’s, the Agogo paramount chief gave the land to them so there isn’t much we can do..... The Fulani’s even claim they have legal grazing permits signed by the chiefs”* (Field Data, 2017). Conversely, most farmers do not hold statutorily registered titles that may serve as proof of land ownership. Instead, proof of land ownership hinges on a self-regulated communal acknowledgement of the family’s land assets as well as long-term or active cultivation of land parcels.

The changes in pastoralist’s land rights from customary licenses primarily in northern Ghana to customary tenancies and statutory leases are in line with Platteau’s (1996) evolutionary theory of customary land tenure. While the customary license conferred no inherent proprietary right to customary land, the seasonal customary tenancy agreed at sub-market rates did not confer any proprietary rights either. Meanwhile the leasehold interest in its nature confers a proprietary right of ownership to the allocated land area for the agreed period. Pastoralists’ leasehold tenure is characterised by division of tenure and rights of exclusion while it actively erodes the communal sense of sharing that characterises customary licences and seasonal tenancies. Contrary to Platteau’s (1996) predictions, the recent changes cannot be viewed as a natural transition from communal to private tenure arising from population pressures; instead, the changes arise from the nature, type and quality of negotiations between herders and land owners.

Power dynamics and abuse of discretion

Land acquisition by pastoralists in Agogo was largely micro-managed by the paramount chief of Agogo and members of the traditional council without informing community members. Ninety-five percent of farmers acknowledged little or no knowledge of the lease terms between pastoralists and chiefs because the chiefs did not seek their consent during land grants. Article 267(6) of the Constitution of Ghana (1992) supports the nature of customary land management in Agogo and mandates the chief to maintain the authority of his paramountcy through market-based processes including negotiating land deals and collecting revenues accruing from land. This provision has been largely misconstrued thus creating major lapses of power concentration with traditional authorities (Goldstein and Udry 2008). While article 36 (8) of the Constitution of Ghana (1992) recognises chiefs and family heads as land trustees, they have instead annexed such communal land, treated it as their private property and unilaterally profited from the proceeds (Ubink and Quan 2008). Blocher (2006) attributes the abuse of discretion by chiefs and some family heads to lack of written records and indeterminate boundaries of customary lands. Nonetheless, Article 36 (8) of the Constitution of Ghana (1992) condemns such power abuse and encourages chiefs and family heads to recognise that their roles as trustees carries a social obligation to serve their communities rather than their self-interests.

Owing to the notion of total ownership of land by the paramountcy without accountability, members of the Agogo Traditional Council opined that chiefs did not appreciate

the need for engagement with the larger community during large-scale customary land allocations. While similar absolute land ownership sentiments were expressed by farmers, the toleration of abuse of discretion by the paramountcy is best captured by the remarks of a 78-year-old elder of the Agogo Traditional Council who remarked that *"He [Nana Akuoko Sarpong] is the paramount chief working on behalf of the Asantehene [King of the entire Ashanti kingdom] and he can do with the land as he pleases"* (Field Data, 2017). Thus, the Agogo paramountcy is subservient to the political authority of the King of the Ashanti state (*Otumfuo*) who exercises executive power over all other sub-paramountcies within the spatial confines of the kingdom. Interviews with family heads in Agogo Ahenbrono confirmed similar grant of usufruct family lands totalling 40 acres to pastoralists. Such leases were granted by the family heads without the express knowledge of the community chief (*Odikro*) let alone the paramount chief (*Omanhene*). These usufruct-herder land deals were similarly observed by Kuusaana and Bukari (2015) who concluded that the customary grant of grazing leases to pastoralists by the paramountcy opened the flood gates for indiscriminate grants by usufructs without informing the paramountcy for record keeping purposes. While farmers expressed low trust in the stool to protect their farmlands, they reported high levels of trust in the family unit and its ability to safeguard lands under cultivation by family members while granting uncultivated lands and usually farther and marginal lands to herders.

Perceived tenure (in)security

When asked about the extent of perceived tenure insecurity, a 32-year-old farmer in Agogo Ahenbrono opined that *"It is a real threat, you may lose all your harvest. Many people have quit farming and migrated to the cities. Even some villages are empty now and those who are farming do so in constant fear of being attacked by herders or their crops being destroyed"*. Most farmers orally expressed perceived tenure insecurity however they related such insecurity to three major factors including land scarcity and monetisation of customary land rights, farmland encroachment and distrust in dispute resolution processes.

Land scarcity and monetisation of customary land rights

First, farmers related perceived tenure insecurity to land scarcity. They attributed land scarcity to population growth and technological changes which leads to demands for new cultivable lands among usufructs. Land scarcity fuels perceived tenure insecurity by increasing competition for the resource thus, forcing farmers to move into herder grazing areas and herders to move into farmer's cropping areas (Flintan 2012). Aside increases in human population and technologically induced land demands, farmers intimated that increases in cattle numbers, leads to overgrazing which encourages continuous movements towards the greener farmland areas. A unit committee member of the district assembly alleged that *"some of the 6 [Ghanaian] cattle owners [who hold leases] have sublet portions of their land to new cattle owners and recent enumeration surveys shows the existence of over 25 different [settler] cattle groups with an approximate total of 50,000 cattle in the district"*. He further

intimated that cattle numbers in the Agogo plains are variable. The numbers are higher in the dry season (November– March) when migratory herders join sedentary ones and that is when crop destruction and perceived tenure insecurity is highest. Farmers further noted that land scarcity encourages the monetisation of customary land rights and development of customary land markets as found for example by Goldstein and Udry (2008) and Boamah (2014a).

Monetisation of customary land poses a potential risk to tenure security of usufruct farmer's non-market-based land rights. The FGD's revealed farmers' belief that pastoralists were favoured by chiefs in land allocation due to the latter's ability to pay market rates for leases as opposed to them (usufruct farmers) who pay nothing for use of land. To buttress this claim, farmers reported that chiefs and family heads give excuses of land unavailability and disregard usufructs during land allocations. Instead, lands that are sometimes under cultivation by usufructs are granted to herders for grazing purposes and in exchange for monetary payments (Field Data, 2017). These claims by farmers proved difficult to verify because they did not have access to the lease agreement that specified the spatial boundaries of lands granted to herders. Thus, the allegations were based on speculations among farmers, some of whom believed their farms were destroyed because chiefs and family heads had granted their lands as part of larger concessions to pastoralists. Nonetheless, tenure insecurity arising from speculations of multiple and parallel ownership (pastoralists through market-based leases and usufructs through non-market allocations) was low among farmers whose land holdings were inherited but higher among such farmers who depend on the family collective or chieftaincy institution for access to unallocated land. The extent of monetisation of a hitherto non-market resource is captured in the words of an executive member of the Kowireso farmers' cooperative. He alleged that *"because cattle owners are rich, the chiefs are easily influenced to give them our lands in exchange for money as opposed to us [usufructs] who usually pay nothing or only as much as one bottle of schnapps as a token for use of the land"*. The preference for land users that provide higher remuneration and consequent disregard of usufruct's land rights may invoke feelings of deprivation, discontent and unfairness that serve as an undercurrent for tenure insecurity (Schaefer 2008).

Farmland encroachment

Furthermore, farmers identified land encroachment and farmland destruction by cattle as a fundamental indicator of tenure insecurity. Interviewees opined that farm destruction was done deliberately by pastoralists as an expression of power and ownership of the land that farmers cultivate. Farmers complained that Fulani herdsmen leave cattle unattended or deliberately move them to feed on crops. While acknowledging that pastoralists may have very generous yet verifiable market-based rights to lands in Agogo, it is important to note that the lease agreement gives pastoralists the right to graze animals within a certain perimeter and not to graze in a manner that destroyed farmlands. Evidence of deliberate crop destruction is given by a male farmer in Agogo Ahenbrono when he remarked *"I took a loan of 20,000 Ghana Cedis to farm and when I harvested my watermelons, put them together in a mound and left to get a vehicle to convey it to*

the market, I came back to find the Fulani cattle feeding on the watermelons. They had been deliberately cut into halves by herders to make feeding easier for cattle. When I complained I was told even cattle like watermelons.....How do you expect me to react to this?" (Field Data, 2017)

Farmers further observed that much of the farm destruction takes place when the Fulani herdsmen lead the cattle to feed at night and when they deliberately set fire to usufruct's farms during the dry season, in an attempt to encourage the early growth of fresh grass. Farmers relate the incidences of deliberate crop destruction, setting of fires to farms and violent clashes, to pastoralists' attempt at asserting their land ownership claims and intimidating farmers off their farmlands. A 52-year-old female farmer in Kowireso remarked that *"Fulani's neither respect our [usufruct farmers'] land rights nor boundaries. They view our crops as feed for their cattle.....the Fulani boast that the chief has given them documents that show they can graze anywhere and can destroy farms in the process"* (Field Data, 2017).

Additionally, farmers perceive their tenure insecurity as highest in the dry seasons when the grass in the plains are inadequate and cattle numbers increase due to the influx of migratory pastoralists. A 43-year-old female farmer in Agogo Ahenbrono while asserting that pastoralist's activities are rampant in the dry season stated that *"when the dry season comes and the grasses in the plains start drying, then they move more towards the greener areas where our farms are located and that is when they go on the wildest rampage"* (Field Data, 2017). This is in line with results found by (Moritz 2010) that climate change is a precipitator of farmer-herder land contestations. The constant contentions between farmers and herders relates to a sense of either group feeling relatively deprived of their perceived legitimate rights to land which invokes feelings of discontent and antagonism between both groups (Schaefer 2008). Lund et al. (2006) ascribe the contentions between farmers and herders to the concept of resource competition which typifies a competition over land resources for survival by different use groups. In the case of Agogo, resource competition is evidenced by either group believing in depriving the other of ultimate access; hence, both lay legitimate claims to the land; farmers through usufructuary rights and herders through market-based rights.

Distrust in conflict resolution institutions

Customary dispute resolution primarily lies with the paramount (*Omanhene*) and community chiefs (*Odikro*) in Agogo. However, 85% of farmers distrust the traditional mechanisms for dispute resolution and allege that chiefs unduly favour pastoralists. The Krontihene however debunked the allegations of favouritism and explained the difficulty in identifying which exact herd of cattle destroyed a farmer's crops, more so when the herders are not registered with the Agogo Traditional Council. Farmers (60%) therefore resort to formal state institutions including the police and court systems but many (54% of those who resort to state institutions) report perceived corruption and distrust in the formal processes of dispute resolution. Farmers alleged during FGD's that the police and court systems have been corrupted by the rich cattle owners, some of whom were politicians and prominent persons. The level of distrust in state

institutions is succinctly captured in the words of a farmer in Agogo Ahebrono who remarked;

"Go to the police station or court? What? How much money do I have? Don't annoy me, don't annoy me at all. Go to the police station or court and find out whether they will help you. What are you talking about? The police here are so useless. When you report that your farm has been destroyed by cattle, they tell you to go and catch the cow and bring it. But how can you catch a cow? Can you take a cow to court?"

With a breakdown of trust in both customary and formal conflict resolution processes, farmers preferred resorting to direct confrontations with herders as the ultimate solution to protecting their customary land use rights and preventing crop destruction. Farmers find that the inability to amicably resolve disputes and surcharge herders for crop losses fuels tenure insecurity and reduces the propensity of exclusive enjoyment of the economic fruits of cultivation. Similar results of low trust among farmers in customary and state dispute resolution processes was found by Opoku (2014) in his study on management of farmer-herder conflicts in Agogo. Despite high levels of perceived tenure insecurity among farmers, they were confident that pastoralist activities which were periodic and only rampant during the dry season could not expropriate them from their lands. In asserting this confidence, a 58-year-old executive of the Kowireso farmers' cooperative iterated that *"The land belongs to us and it's the only intergenerational commodity that we will leave for our children so we will not allow foreigners to claim it"*. Thus, farmers exhibited a high propensity to cultivate their plots in the coming seasons and they plan to hold their plots long enough to pass them on to succeeding generations.

Tenure insecurity and farmer's investment decisions

The conflict situation in Agogo provides a verifiable case of tenure insecurity expectations. When asked about the investment decisions they had taken in the light of threats to their land tenure, farmers reported mixed responses that have been categorised in accordance with some theoretically informed measures of the relationship between investment and tenure security.

Farm size changes?

Majority (85%) of farmers reported no change in their farm sizes. While motivating this decision, a farmer in Agogo Ahebrono remarked *"Whether you make the farm big or small, they will still attempt to destroy it, so it is better to make it big once and for all so that even if they destroy parts of the farm, you will still be able to get quite a healthy return"*. When probed further on the rationality of cultivation in expectation of crop destruction by cattle, farmers noted that farming in Agogo was a very profitable venture with a high propensity to recover losses in subsequent years even if a farmer lost all his/her crops to pastoralist activities in a given year. A 47-year-old farmer in Kowireso explained that; *"As for us here in Agogo, God has really blessed our land...it is very fertile. We don't use any chemicals or fertilisers on our farms but our harvest is always*

good. Our cost of production is very low so even if you lose all the harvest in one year, you know you can recover your loss in the subsequent years unless you contracted a bank loan that attracts high interest. Look at the beautiful house up the hill [pointing finger at a blue painted building], it was built in less than 6 months by a young man who cultivated plantain but fortunately did not experience much farm destruction by cattle. Our only problem is the cattle. If only they stayed in the areas allocated to them by the chiefs".

Further analysis revealed that farmers invest little financial capital and high sweat equity by cultivating farms themselves or receiving help from family members. Thus, their most important proxy for measuring profits is the difference between returns from farms and financial capital invested (including cost of hiring farm machinery) without quantifying 'free' labour costs from their own efforts or family members. This thinking which largely underestimates farmer's expenditure and fuels false profit calculations partly explains why farmers have made no changes to their cultivated farmland area, regardless of expected farm destruction by pastoralists. Additionally, farmers acknowledged that they continue farming because their livelihoods depended primarily on it and they lacked the opportunity and ability to learn new non-farm skills. While affirming this notion, a female farmer in Kowireso remarked *"Stop farming totally and do what? That will be equal to me committing suicide. How will I survive? I will rather go to the farm and risk being killed than starving to death because hunger is painful"*.

The finding was inconsistent with Besley's (1995) theoretical expectations of decrease in farm sizes when there are verified and perceived threats to land tenure security. By deduction, most farmers (85%) in Agogo are unwilling to allow pastoralists to force them off their land nor do they feel the current threat to their tenure security is great enough to push them totally away from their primary livelihood activity (farming). Resulting, the expectations of direct relationships between land tenure security and investment are challenged in Agogo when (a) farmers feel their ultimate survival depends on the land, due to a lack of viable livelihood diversification options that offer commensurate returns as farming and (b) when they conceive the financial capital they invest as little and have false profit notions.

Changes in cropping patterns

Most farmers report cultivating three to five different types of crops on their farms in accordance with mixed or seasonal (dry or rainy season) cropping techniques. They intimated that the types of crops cultivated have not changed much because their lands are suitable for cultivating those crops with very minimal fertiliser application. Thus, 92% of farmers report continuous cultivation of plantain as their primary food crop. A small minority (8%) mostly female farmers have moved away from cultivating plantain. When asked the reason for such change, they explained that plantain cropping takes up to 12 months to mature hence the crop risks being destroyed during the dry season when agropastoral activities are highest. Some farmers (6%) acknowledge avoidance by not cropping during the peak dry season to avoid contact and altercations with Fulani herders. Plantain farmers especially preferred to start cropping towards the end of the dry season or the beginning of the light rainy season (September to November) to

ensure crops are mature and not easily destructible in the next dry season when pastoralist activities are highest. They revealed strategies of altering crop planting dates and cultivating early maturing crops including vegetables and cereals although the returns are much lower than returns from cultivating plantain. A 32-year-old female farmer in Kowireso details how she undertakes crop diversification by remarking that *“during the dry season, we normally diversify into garden eggs, okro, tomatoes and water melons because they have shorter maturity periods....and when the dry season is prolonged unexpectedly, we prepare our nurseries and wait until the first few rains for the pastoralists to move further towards the plains before we start cropping”* (Field Data, 2017).

The nature of farmer's crop diversification strategies against threats to tenure security is in consonance with results found by Saumik (2015) in his investigation of crop diversification strategies by smallholders in the southern provinces of Cote d'Ivoire between 2002 and 2008. Saumik (2015) found that farmers resorted to cultivating different crop types and altered their planting dates in response to changing severity of tenure insecurity. This observation is difficult to relate to expectations of changes from longer maturity crops (cash crops) to early maturing crops occasioned by threats of tenure because farmers are already traditionally engaged in cultivating annual crops and keep historical cultivation patterns passed on from their parents. The preference for plantain farming in Agogo is explained by historical losses in cocoa cultivation attributed to diseases and bush fires in the 1980s (Kuusaana and Bukari 2015). It is further influenced by the high cost of maintaining longer maturity cash crops, including fertiliser application, weed and disease control as compared with cultivating plantain which farmers assert requires less fertiliser and pesticides hence is easier and cheaper to cultivate. The finding contradicts theoretical expectations by Pagiola (1999) because the farmer-herder conflict has not occasioned much changes to farmer's cropping patterns despite increasing threats to land tenure security posed by the conflict.

Farm improvement strategies

Due to historical cropping practices and bi-modal rainfall pattern in Agogo, farmers did not use permanent tree cropping or irrigation development as investment strategies to lay claim to their land as shown for example by Sjaastad and Bromley (1997). Instead, strategies adopted by farmers (10%) in a direct attempt to ward off pastoralists and protect the spatial area of their farms included building farm houses to show their presence on farms and investing in the erection of wire mesh fencing to reduce crop loss. These farm improvement actions that serve as a statement of claim to the land are however contrary to theoretical predictions by Blarel (1994) who finds that investments in farm improvement are likely to reduce as tenure becomes insecure. Though these acts do not expressly serve as mechanisms for laying claim to land by making permanent or long-term changes to the land itself, they may be viewed as auxiliary mechanisms of farm improvement for reaching similar objectives of improving tenure security. However, neither the farm houses nor fences have proven adequate in totally preventing cattle from encroaching on farms. A farmer in Agogo Ahenbrono recounted how he erected fences around his 20-acre plantain farm but the fences were destroyed by cattle in less than two years. While alleging that Fulani herders deliberately pull down the fences to allow cattle access to their farms, he agreed that fencing slows down the ease of destroying farms.

Off-farm investment and livelihood diversification

Even though farmer's investments in land have not changed much to accommodate the threat to tenure security, they acknowledge an increased probability of partial or total crop losses; hence, many adopt coping strategies to supplement incomes from farming. These strategies can best be described as partial diversification which relates to an intermittent resort to other income earning activities to support farm revenues, without the total abandonment of farming. Farmers acknowledged that they engage more with secondary and auxiliary jobs during the minor season when the activities of pastoralists are high. Common jobs include engagement in off-farm casual labour (usually in cities), petty trading, management of micro-enterprises, carpentry, teaching, lumbering, charcoal burning and other off-farm economic activities. A 62-year-old farmer from Kowireso remarked that *"Some people have their husbands or children open small retail shops for them to sell. But what happens if you don't have a child or husband, who will do this for you?"* (Field Data, 2017).

Data collected indicated that most farmers (62%) intermittently take casual labour jobs mostly in Konongo, Kumasi and other nearby urban areas however educated and skilled farmers (14%) switch to their secondary occupations. Similar results were found by Trærup and Mertz (2011) in Tanzania while investigating climate vulnerabilities and associated coping strategies thus validating the hypothesis that farmers adopt partial or permanent diversification activities when threats to their livelihood is imminent (Ellis 1998). In the case of Agogo, none of the farmers engaged in permanent livelihood diversification activities. When asked why they have not considered the option of total livelihood diversification, a female farmer in Agogo Ahenbrono remarked *"We are too old to learn new skills. Farming is what we are good at but we have decided to educate our children well so that they don't have to farm and risk being killed by pastoralists like we do daily"*. However, farmers recounted stories of how some farmers totally quit farming and moved to the urban cities of Accra and Kumasi because of death threats from pastoralists and the consistent destruction of their crops.

Abandonment

Lazarus and Folkman (1984) posit that individuals are likely to adopt gradual minimisation and abandonment strategies when they conceive threats to their livelihoods as high. Though no respondents admitted to plans of total abandonment of farming, they recounted many cases of abandonment by colleague farmers who now engage in petty trading or have migrated to cities. A local government officer of the district assembly explained the severity of the abandonment problem by acknowledging that in another community (Pataman), the population of 500 has reduced to less than 200 because many people abandoned farming due to the recurrent threat posed by pastoralist activities to tenure security (Field Data, 2017). These abandonment decisions may not be entirely attributable to agropastoral activities because subsistence farming as an economic activity is gradually losing prominence in rural Ghana (MoFA 2015). However, the decision to quit farming, given a verifiable option is much quicker when threats to land tenure security are high. The assembly member for Kowireso electoral area succinctly described his leaning towards abandonment. He remarked *"Even as an assembly man, I am no longer interested in farming. I rather concentrate on my teaching and less*

on my farm because I incurred a huge debt that took me 5 years to repay after 30 acres of my plantain farm was destroyed by cattle” (Field Data, 2017). In lieu of total abandonment, the interviews revealed that farmers take periodic breaks or minimise their farm investment in years they expected high agropastoral activity due to droughts. Furthermore, farmers indicated low likelihood to undertake cultivation in the absence of the operation Cow Leg joint police-military force or when they perceive low political will by state and traditional institutions to remedy the recurrent farmer-herder clashes.

Conclusions

Using a systematic qualitative analysis, this paper unveils the implications of farmer-herder conflicts on indigenous farmer's investment decisions in Agogo. The analysis revealed that land management in Agogo is done in accordance with communal land tenure arrangements where traditional authorities including chiefs and usufruct family heads hold land on behalf of the collective. Further analysis showed that chiefs and family heads while acting as fiduciaries with a duty of trust over land, abuse their discretion and instead exercise exclusive ownership rights (see Goldstein and Udry 2008; Ubink and Quan 2008). Consequently, pastoralist's land rights have changed from customary licenses through customary tenancies to statutory leases: an indication of the evolutions in land rights of pastoralists towards privatised tenure (see Platteau 1996). Meanwhile tenure insecurity is high among farmers due to climatic changes, high cattle population and use of mechanised cultivation methods. The already tenuous land rights of indigenous user groups are worsened by activities of farmer vigilante groups whose aim is to dispel cattle herders from their communities on grounds of livelihood disruption while an equally charged movement of armed herders resists expulsion from their statutorily registered grazing fields. Regarding the implication of tenure insecurity on farmers' investment decisions, the first conspicuous finding revealed that land tenure insecurity has little effect on the farm sizes cultivated by farmers. This finding appears counterintuitive and paradoxical as it contrasts sharply with theoretical conceptions by Besley (1995) who hypothesised that threats to tenure security will invariably lead to reductions in farm sizes. Farmers bemoaned their inability to engage in other economic activities despite perceived threats to land tenure security because the readily available livelihood diversification options did not offer commensurate returns as farming. Thus, they preferred to risk farming in expectation of partial crop destruction by herders while harvesting the remaining for sale.

While some farmers (8%) alluded to changing their crop types to early maturing crops, most farmers (92%) kept cultivating the same crops in the face of tenure security threats; a development that is in contrast to Pagiola's (1999) theoretical predictions. Furthermore, farmers preferred the relative ease of keeping to historical cultivation patterns of plantain farming because it required lower financial investment yet it offered quicker returns than longer maturity cash crops such as cocoa and coffee. With recurrent tenure insecurity concerns, farmers sought to invest more in farm improvement infrastructure that they perceive can increase their ability to safeguard an uninterrupted harvest. These included erecting fences and building farm houses. Though they did not undertake these farm improvements as explicit acts to legitimise their land rights through increased farmland investment as found by Sjaastad and Bromley (1997), farmers invested in these auxiliary facilities based on the perception that it could help

them safeguard their ability to continue reaping the economic fruits of their farmland investments. These acts typify a security-driven motive for farmland improvement and contradict findings of reductions in farm improvement due to tenure insecurity as shown by Blarel (1994) in Rwanda. In sum, the research findings corroborate those found by Fenske (2011) who opined that the land tenure and agricultural investment relationship is largely context specific. This paper adds perceptions of total livelihood dependency on farming, lack of verifiable diversification options, development of auxiliary farmland infrastructure based on security motives and false profit reporting to exceptions to the application of the theories that define the tenure security and investment relationship. Turning from analysis to prescription, some farmers noted that their tenure insecurity concerns may be addressed through transparent land deals and negotiations instead of current militarisation actions. The critical question asked by a prominent researcher on expulsion during a personal interview still remains unanswered; *“when you push them out, where do they go? To cause mayhem and create tenure insecurity in other communities?”* (Field Data, 2017).

Farmer-herder conflicts remain a complex phenomenon as it points to a larger picture of struggles for survival between two important stakeholders in Africa's agricultural sector. Paying little attention to the implication of these contentions on economic development is likely to deepen mistrust and escalate conflicts between the two groups. At present, Ghana risks farmer-herder conflicts further escalating due to tribal sentiments to reject the Fulani in many communities (see Bukari and Schareika 2015). Allegations of unfairness and mishandling of the conflict has been raised in the corridors of national politics with the paramount chief of Agogo being accused of belonging to a political party that is sympathetic to the plight of herders (see Bukari 2017). The sharp ethnic divisions, socio-political and economic effects that unresolved contentions between farmers and herders creates requires that the situation is swiftly remedied before it degenerates further. Rather than a one size fits all solution as seen in the case of militarisation and flushing out activities, it is recommended that a targeted approach that takes into consideration the unique contextual undertones of each conflict is adopted. Additionally, the state is encouraged to register migrant pastoralists for purposes of ensuring continuous engagement and reducing conflicts arising from farm destruction by unidentified herders. The creation of rental ranches for temporal use by migrant pastoralists, demarcation of grazing reserves far from farmlands and dedication (including signage marking) of cattle routes may help improve the farmer-herder relationship. Finally, it is important that farmers are educated against holding hostile views of pastoralists and furnished with an independent, fair and trust worthy mechanism of dispute resolution.

Abbreviations

ATA: Agogo Traditional Area; ECOWAS: Economic Community of West African States; FGD: Focus Group Discussions; MOFA: Ministry of Food and Agriculture; PNDCL: Provisional National Defence Council Law; REGSEC: Regional Security Council; SSA: Sub-Sahara Africa; UN: United Nations; UN-Habitat: United Nations Human Settlements Programme

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Authors' contributions

SKK defined the research questions, reviewed literature and undertook data collection. Both SKK and PYA wrote the theoretical section, analysed data and wrote conclusions. Both authors read and approved the final manuscript

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Availability of data and materials

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Declarations**Ethics approval and consent to participate**

The research did not require ethical approval according to Lund University's ethical committee which suggests that ethical approval is required when the research concerns handling personal information concerning race or ethnic origin, political views, religious or philosophical convictions, trade union membership, health, sexual orientation or sex life, genetic data, biometric data, vulnerable groups and legal offences. Ethical approval is also required for studies related to a physical intervention on a living human being or a deceased person or a method which aims to affect the research subject physically or mentally or entails an obvious risk of harming the research subject physically or mentally. Approval is further required for studies on biological material taken from a living human and traceable to that individual or a deceased person for medical purposes and traceable to that individual. Since the research does not relate to any of the above-mentioned nor falls within the suggestions for ethical approval by the World Medical Association's (WMA) Declaration of Helsinki, it did not require ethical approval from Lund University's ethics committee.

The research however acknowledged the need for informed consent. The researchers thoroughly explained the reasons for the research and sought the consent of respondents. Consent forms were prepared in accordance with Lund University guidelines (including confidentiality and anonymity of data) and explained by the researchers before signing by respondents. Respondents were given the option to willingly participate in the research and withdraw at any time. Respondents also did not include minors (under 18 years). Key informants consented to the use of their names in the final report while the remaining respondents declined hence, pseudonyms are used where possible.

Consent for publication

The authors approve the manuscript for publication upon acceptance by the journal and after peer review.

Competing interests

The authors declare that they have no competing interests.

Author details

¹Department of Human Geography, Lund University, Geocentrum 1, Sölvegatan 10, 22362 Lund, Sweden. ²Department of Economic History, Lund University, Vaktmästeriet i EC1 Holger Crafoords Ekonomisentrum Ole Römers väg 2, Lund, Sweden.

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