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Research Paper

Perceived agricultural land use decisions in a peri-urban district, Ghana

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Abstract. The paper analyses farmer households' decisions on agricultural land uses in peri-urban Asante-Akim South District of the Ashante region, Ghana. Rapid peri-urbanization has resulted in increasing demand for, and pressure on arable lands. The decision to convert from agricultural land uses to other land uses is driven by a myriad of factors, ranging from social to economic. Using a triangulation of qualitative and quantitative methods, 120 household respondents were proportionately sampled from three communities in the district, for questionnaires administration and interviews, to collect data. Data was subjected to Pearson's chi-square, contingency and frequencies tabulation analyses embedded in the SPSS V.17. Results show that there is increasing peri-urbanization, resulting from increasing demand for residential and commercial land uses at the expense of arable land uses. These outcomes have perceived negative implications on food productivity and security in the district. The District Assembly's policy focus should be geared towards the protection of prime agricultural lands, as physical development cannot be avoided.

Keywords: Peri-urbanization, agriculture land use decisions, Asante-Akim, Ghana.

INTRODUCTION

A number of factors contribute to peri-urbanization, thus peri-urban areas result from rapid urbanization which leads to the outward expansion of cities and results in changes in land uses (Owusu and Adjei, 2007). These areas come about when urban residents buy up prime agricultural land for residential or commercial purposes outside the main city center but on the fringes of cities (Prakash, 2008). Thus, access to land remain the driving force or pull factor drawing most people to settle in peri-urban areas regardless of the distance it may be in accessing the city centre (Amoateng *et al*., 2013). In this connection, the study sought to find out the main causes of peri-urbanization in the Asante-Akim District of the Ashante Region.

The rural land is easy to access in the sense that it is relatively cheaper than lands within the city and not highly under demand according to Kasanga and Kotei (2001). Migrants to these areas find it easy to access these lands and quickly use them for their agricultural activities.
However as the cities become congested and land in the urban areas attract a great deal of demand pressures, attention seem to have been shifted to arable land (Mazzochi *et al*., 2013); for the purposes of urban land uses, such as residential, commercial and recreational (hospitality mainly). This argument supports the assertion made by Cobbinah and Amoako (2012), that rural land uses are being converted into peri-urban land uses and ultimately urban Lambin *et al*., 2003. Accordingly, a combination of factors is responsible for the emergence of peri-urbanization or urban sprawl into the rural fringes, creating melting transitional peri-urban zones.

However, the peri-urban zone definition has gone

beyond, as a place with an admixture of urban and rural livelihoods, being pursued, and theorizes about the peri-urban processes (Narain and Nishcal, 2007). Friedberg has argued that the peri-urban is fundamentally integrated into urban contexts. As such, peri-urban areas occupy 'unique space, in that they are simultaneously sustained and threatened by the dynamics of the urban economy' (Friedberg, 2001: 353).

According to Masanja, (1999), there are two major driving forces for conversion of agriculture land use in the peri-urban peripheries, that is, demands for housing for the growing population and the deteriorating housing conditions and inadequate urban services (Doos, 2012). Also, another reason for the conversion of land was discovered by Webster (2002), and supported by Mandere *et al*. (2010) as being a result of higher economic gains over the agriculture returns. With rationality of the farmers, they would go in for other activities with higher earnings other than the agriculture, in the end, subtly endorsing food insecurity in the areas.

According to the World Food Summit in 1996, food security exist when all people at all times have physical or economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life (FAO, 2010). In addition, the FAO's State of Food Insecurity report (2011) stated that, food security included four elements: food availability, food accessibility, food utilization and food system stability. Defining the various elements, availability of food focused on food production, accessibility focused on the ability of people to obtain food, either through production, purchase or transfers. Also utilization of food also aimed at the actual consumption, whilst stability of food focused on the stability of supply of food and easy access.

Over the years however, there have been records of low food production followed by a rise in the food prices (Bukeviciut *et al.*, 2009). Food prices are mostly determined by a complex combination of various factors, among them is substantial increase or decrease in agriculture production and output (UNEP, 2014).

The effects of food prices by the changes in agriculture land use has not been embraced by many policy makers and researchers, given that, other factors come into play in determining food prices other than agriculture land use changes (Baker, 2008). However, Xu *et al*. (2004) argued that no matter how insignificant the conversion of agriculture land seems to be, it also plays a role in determining food prices, and hence its security.

The Asante Akyem South District, with the capital as Juaso, is a peri-urban district with its surrounding rural communities. As a result of land use expansion in the direction of residential and commercial, agriculture land is declining. This is hampering the development of the agricultural subsector in ensuring food security in terms of availability, access and affordability. Development in the periphery is characterized by progressive conversion of agricultural and forested land to peri-urban uses.

The original forest and agricultural land use is usually converted into residential, commercial and industrial areas. A number of studies have investigated the effects of factors driving peri-urban expansion (Keys and McConnell, 2005; Shriar, 2005; Li *et al.*, 2013). However, to date, little study has examined the influencing drivers of peri-urban expansion on arable agricultural land, in the

District and surrounding communities. This study sought to find out the agricultural land use conversion decision in the Ashante Akim South District of the Ashanti Region of Ghana.

METHODOLOGY

Profile of the study district

The study was conducted in the Asante-Akim South District located within the Latitude 6° 10' and 6° 40' and Longitude 0° 50' W and 1° 17' in the Ashante Region of Ghana, with *Juaso* as the District capital (Figure 1). The agricultural sector is mainly food and cash crop farming with little livestock rearing activities. The climate and vegetation is characterized by maximum temperatures recorded between March and April and the minimum temperature in August. The mean monthly temperature is 26°C. The district also experiences a double-maximum rainfall. The major rainy season is between April and July, reaching its climax in June. The minor season occurs between September and mid-November. The mean annual rainfall ranges between 1500 and 1700 mm (GSS, 2012).

The district falls within the Moist Semi-Deciduous Forest zone where different species of tropical hard woods with high economic value can be found. The trees species found in the district include; *Wawa (Triplochiton scleroxylon)*, *Denya (Cylicodiscus gabunensis), Mahogany (Khaya ivorensis), Asanfena (Aningeria spp.) and Onyina (Ceiba pentandra).* In certain parts of the district, however, the original forest cover has been turned into secondary forest and grassland through indiscriminate exploitation of timber and inappropriate farming practices such as the slash and burn system. Currently the district can boast of 5 major forest reserves covering a total of about 109.6 km^2.

Sampling design, instruments and data analysis

Probability simple random sampling was used to select the respondents from the district's list of farmer household population size of about 17,540. This approach was used because the population of the communities is fairly homogeneous in terms of their occupational activities. This technique reduced biases and

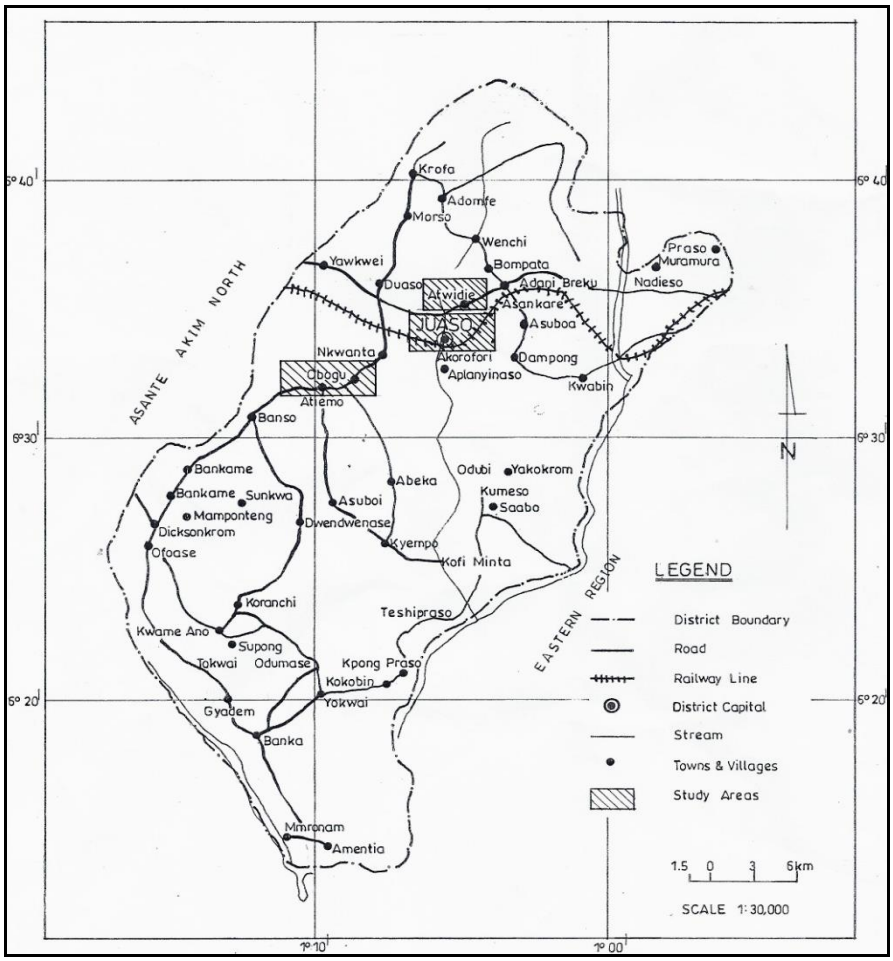

Figure 1. Map of the Asante Akim South District.

also helped in drawing general conclusions from the various household heads. The main targets for study were the heads of household in the district. The selected communities were *Juaso, Obogu* and *Atwedie*. These communities were selected based on their co-existence of both rural and urban activities as a result of peri-urbanization and proximity to the urban city as they were found at the peripheries.

In order to ensure generalization and a fair representation from the three selected communities, the proportionate sampling method was used to select 45 households from *Juaso,* 35 households from *Obogu*, and 35 households also from *Atwedie*; these were based on their respective population sizes. Also 5 key informants were purposively sampled from the Ministry of Agriculture and the Asante Akim South District Assembly. In all, a total of 120 respondents constituted the sample size for the study.

The questionnaire was the key instrument used. It consisted of a blend of partially pre-coded and pre-coded questions that were administered to the respondents. The collected data was analyzed using the embedded tools of frequency and cross-tabulation and Chi-square test of association in the Statistical Package for Service Solution (SPSS). Qualitative data was also analyzed thematically in a descriptive and explanatory manner and used as support of the quantitative results. Tables and graphs were produced in the Microsoft Excel software.

RESULTS

Here, the authors present the results from the analysis of the primary data collected and presented in tables and figures. Table 1 shows that respondents' understanding of what constitutes peri-urbanization is not only limited to population expansion or increase, but also the increasing demand for residential facilities outside Juaso and the subsequent expansion of infrastructure to meet the demands of both urban and rural dwellers along the urban transition zones.

It can be noticed that while 37% of the respondents perceived peri-urbanization in the district to be an increase in residential activities in the urban area, about

Table 1. Perceptual definition of peri-urbanization.

Perception	Frequency	Valid percentage
Increasing population	37	32
Increasing infrastructure	3	3
Increasing population and infrastructure	32	28
Increasing residential activities	43	37
Total	115	100

Source: Fieldwork (2015).

Table 2. Uses of peri-urban lands.

Peri-urban land uses	Frequency	Valid Percentage
Land use for residential activities	28	24
Land use for commercial activities	8	7
Land use for recreational activities	8	7
Land use for administrative activities	6	5
A mixture of all land uses	65	57
Total	N = 115	100.0

Source: Fieldwork (2015).

Table 3. Factors determining agricultural land use change.

Determining factors	Frequency	Valid percentage
Easy Access to land	36	31
Changing demand trends in land use	30	26
Deteriorating livelihoods of land owners	16	14
Economic incentives for land use conversion	33	29
Total	N = 115	100.0

Source: Fieldwork (2015).

32% perceived that it is rather due to increasing population in the urban area. Moreover, 28% of the respondents stated that an increase in the population and infrastructure of a community close to an urban area constitute the term peri-urbanization, while 3% linked peri-urbanization to increasing infrastructure.

Uses of peri-urban land

On the uses to which peri-urban lands were put, Table 2 shows that, about 57% of the respondents agreed that peri-urban lands are dominantly used for all kinds of activities, whereas 24% of them saw the land to be used for residential activities, the other activities which were commercial uses, recreational activities and administrative uses were answered by 7 and 5% of the respondents, respectively. Majority of the respondents asserted that peri-urban lands are used for numerous activities which include recreational, commercial, administrative, residential and not forgetting agriculture.

Decisions behind agriculture land use change

The study therefore sought to find out the causes of agricultural land use changes in the surrounding communities of Juaso. The results are presented in Table 3.

Table 3 shows that 14% of the respondents said land uses are changing especially from agriculture to other land uses because of deteriorating livelihoods of landowners, 26% also stated that there is a changing demand for land use, 29% said that land use change is determined by economic incentives for new land use whilst majority of the respondents (31%) explained that the use of land in the peri-urban areas are changing because it is easy to access lands in these areas.

From Table 4, about nine percent of the household heads indicated that they would convert their agricultural lands to other uses because there is excess land sizes and demands trends for land use is changing, 36% of the household heads also indicated that, they would convert

Table 4. Perceived household decisions on agricultural land conversion.

Determining factors	Frequency	Valid percentage
Excess land sizes	9	8
Changing demand trends in land use	10	9
Deteriorating livelihoods of land owners	41	36
Economic incentives for land use conversion	45	39
Other reasons	10	9
Total	N = 115	100.0

Source: Fieldwork (2015).

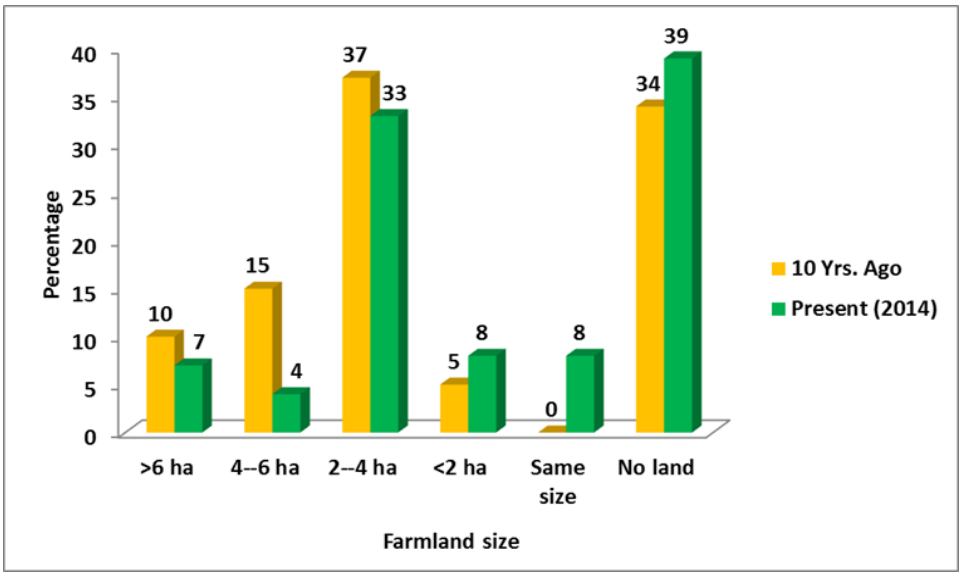

Figure 2. Relationship between peri-urbanization and agriculture land.

their agricultural lands to other activities as a result of deteriorating livelihoods whilst 39% representing majority of the household heads said economic incentives for land use would influence them to convert their agricultural lands to other land uses. Those who said economic incentives for land use change would be their motivation explained that, agriculture is no more lucrative though it is very important.

The study also sought to establish the association between the responses on the general factors determining agricultural land use change and the factors that influence household decision to convert agricultural lands to other land uses. The chi-square statistic of χ^2 at 12 degrees of freedom was 19.801, with the probability value $p > .05$ confirms that, there is no significant differences between the factors that determine agricultural land use change and the factors that influence households' decision to convert agricultural lands to other land uses in the communities. Thus, the general factors that determine the conversion of agricultural lands to other land uses are extraneous to what were espoused by the respondents in Juaso and its surrounding communities.

Effects of peri-urbanization on agricultural land

The study also sought to determine the major effects of peri-urbanization on agricultural lands in Juaso and its surrounding communities. Different outcomes were indicated by the respondents, as displayed in Figure 2.

Figure 2 describes the relationship between peri-urbanization and agricultural lands. From the figure, 10% of the respondents indicated that they had above 6 Ha of land, 10 years ago. However, 7% indicated that they still have the same size of farmland currently. It can therefore be inferred that 3% of the respondents had a reduction in their farmland sizes between the 10-year periods.

Again, out of the total respondents, 15% claimed they had lands between 4 and 10 hectares about ten years ago whereas 4% still had their farm sizes not reduced (that is, between 4 to 10 hectares currently). This means

that 11% of the respondents had lost their agricultural lands between the 10–year periods. Furthermore, 37% of the respondents had lands up to 4 ha about ten years ago. However, 34% still have the same size of land currently.

The following deductions can therefore be made; some of the respondents, who possessed land in sizes of between 4 and 6 ha, currently have their farmland sizes reduced to 2 and 4 ha, representing a percentage of 34 % of the respondents. Figure 2 depicts that a higher percentage of the respondents had no access to productive farm lands. Thirty-four percent of the respondents indicated they possessed no lands for agricultural activities ten years ago, while 39% are currently dispossessed of agricultural land. The above results show that peri-urbanization has caused considerable reduction in the arable lands at Juaso and its surrounding communities.

The study posits that, there is no significant difference between the number of people who owned land sizes less than 10 ha in the past ten years and the number of people who currently have land size of less than 10 ha. In this connection, a Pearson's chi-square analysis was employed to test the association between the nominal variables. The Chi-square test results show that at a-20 degree of freedom, χ^2 value of 40.867, with $p < 0.05$ was reported. This indicates that, there is a significant difference between the number of people who owned lands up to 6 ha, 10 years ago and the number of people who currently possess land sizes more than 6 ha. In addition, to substantiate this claim, the total size of land of 115 respondents 10 years ago, summed up to 244 ha, while the total amount of land from the same number of respondents currently summed up to 196 ha, in relative terms. The difference between them (48 ha) firmly indicates that the amount of agricultural lands for subsistent farming available 10 years ago, has now reduced.

According to the respondents, many landowners have changed the use of their lands. Their claim was that, the unprofitability of agriculture and alternatively high grounds rent offered for land meant for other uses in recent times, compelled majority of farmers to decide to lease and sometimes convert their own lands from agriculture to other uses. The average size of a subsistent farm ten years ago was more than 4 ha. This size has reduced to about 2 ha per farmer, threatening agriculture and food security in the district.

DISCUSSION

Drivers of peri-urbanization and land use decisions

Across the globe, there are a number of factors that influence or determine urbanization. These factors include social, economic and cultural (Masanja, 1999). However, the occupational activities, historically dependent on agriculture, are also influenced by this process as urban expansion shifts toward the peri-urban areas. A place is peri-urban when there is evidence of differences in land uses, particularly the conversion of arable lands to residential and commercial land use (Houston, 2005; Zasada *et al*., 2011). This is not different in the Asante-Akim South District of the Ashante Region. However, the study sought to find out the perception of peri-urbanization from the respondents. Thus, what constitutes peri-urban areas, peri-urban land use and the causes of peri-urbanization?

It is however, important to note that, the term peri-urbanization constitute the varying perceptions of the respondents as outlined in Marshall *et al.* (2009). Respondents who indicated that increasing population means peri-urbanization gave reasons such as: a lot of people migrating from the rural areas to peri-urban communities in search of employment and economic opportunities.

Moreover, because these communities are increasingly becoming urban, there is an influx of migrant workers from both the public and private sectors to work in the peri-urban communities in the district. However, Nilsson *et al.* (2013) argue that, peri-urbanization does not only depend on the migration of people from the rural setting to the urban peripheries but also on other transformations such as recreation and behavioral changes. Respondents who indicated peri-urbanization to mean increasing residential activities and infrastructure, support their assertion by saying that due to the increase in the population of the peri-urban communities, there is a correspondent demand for residence and infrastructure. All these assertions and connotations of peri-urbanization reveal that peri-urbanization involves a transformation in the demographic structure and infrastructure in the urban peripheries (Lewanson *et al.*, 2012).

There are many uses of peri-urban lands. Some of these uses include recreational, commercial, residential and to a minor extent agricultural (Nelson, 2007). Peri-urban lands available for agriculture are relatively low due to the fact that other land uses are increasingly becoming dominant relative to agriculture. In attempt to know the various views of the uses of peri-urban lands from the study communities, various responses were given.

Peri-urban being a zone between the rural and urban is characterized by both urban and rural activities. The urban land uses include buildings for residence, recreation, manufacturing and the like. Also the rural areas are mostly for agriculture purposes (Simon, 2008). This supports the view of the respondents with the higher responses that peri-urban lands are used for multiple activities. Similarly, peri-urban area may contain a disorganized cluster of residential, commercial, rural-residential, and often varied agricultural uses (Irwin and Geoghegan, 2001). Peri-urban areas are usually not

homogenous and may have different characteristics and uses (Buxton *et al.*, 2008). The respondents indicated that residential activities are increasing because of the high demand for houses in the communities. Most of the young adult move into new houses further from the family house after marriage. To substantiate this claim, a farmer in *Juaso* reiterated that:

> *…nowadays everyone wants to live in his own house, nobody wants to live in family house (abusuafie*). He continued to emphasize that; *"if the individual gets money, the first thing that comes into mind is to build a house for his family" (Interview with Respondent, Juaso 2014).*

Another reason for increasing residential land uses in the communities, stems from the traditional extended family system is gradually giving away to the nuclear family system. Hence, people do not longer live in family houses but prefer to live in their own houses. This has therefore increased the demand for land for the building of individual houses. To conclude, the land is used for all kinds of activities which reflect the heterogeneity of peri-urban land uses in Juaso and its surrounding communities. To confirm this, Salvati and Carlucci (2014) indicated that in peri-urban areas, land speculation is a characteristic of urban expansion. This underscores the peri-urban character, which is a combination of land uses, both urban and rural; such as residential, commercial and agricultural land use complexes (Duta, 2012).

Causes of agriculture land use change

Globally, land is used for various activities ranging from agriculture to commercial. Agriculture is the traditional and major use of land in every geographical setting. However, due to urbanization characterized by increased in population and its associated demand for land has resulted in the conversion of agricultural lands to other land uses and built-up environments (residential, commercial and recreation) (Samat *et al*., 2011). In this connection, urban sprawl is encroaching on agricultural lands. This process according to Amoateng *et al*. (2013), is reducing the amount of arable lands in the peri-urban areas for increased agricultural production.

There is easy access to lands in these communities, because land is cheaper and involves less procedure to acquire a parcel of land as compared to urban areas where land is expensive and scarce. This statement confirms that of Afriyie *et al*. (2013), who observed that, in the peri-urban areas, most lands are owned by individuals and the processes to go through to acquire an individual's land, is quite simple. Those who reported that economic incentives are the reason for changing agricultural lands to other uses gave reasons that, other land uses such as building houses and renting them out is more profitable than agricultural production.

Similarly Seto *et al*. (2000) inferred that currently, agricultural production is no longer profitable as compared to the past. In the study areas, most of the farmlands have been invaded by *galamsey* mining and chainsawing operations, as in Juaso. This renders the farmland infertile. Also farming on the land for a long time has reduced the fertility of the soils and so there is mostly low yield of agricultural produce. Another reason is that, subsidies and incentives for farming are no longer encouraging. One farmer sorrowfully commented that: *—The agriculture inputs are so expensive that we are not able to buy them to help us on our farms. As a result, a lot of people are moving away from farming to other activities, especially, petty trading".*

This implies that commercial activities, to which the land is put, have more value than agricultural activities as stated by a respondent from *Obogu*.

Another reason was the changing demand trends for land use. This is connected to economic incentives in the sense that, because agriculture is no more lucrative in these areas, demand for land for agricultural purpose has changed. People now acquire lands for other activities such as commercial activities, residential, recreational and the like. A few of them said that the land use is changing due to deteriorating livelihoods of landowners; giving the reason that, people tend to give their lands out for other activities when they are faced with financial challenges.

The land tenure system in the Asante-Akim South District is not different from what has been enshrined in the 1992 Constitution of Ghana namely public and customary private land ownership (Kwapong, 2009; Kasanga and Kotey, 2001). In the district, farmlands are owned by family heads where other family members or members of the lineage access land through the heads.

Traditionally, these lands are used purposely for agriculture and related activities. However, in recent times, these lands are being demanded for purposes other than agriculture. In the light of this, the study also sought the views of the households' and family heads on their motivation to lease part of their land for uses other than agriculture.

Using the lands for residential activities is much profitable because, buildings last longer and can easily be rented out. Sometimes the lands are leased for other activities when the livelihoods of the family are deteriorating. The influence of poverty influences, for instance, make household heads to easily lease their land for the money when he/she is financially bankrupt (Kwapong, 2009).

There are a number of factors that influence people to convert their lands to other uses; however it is clear from

the study that economic reasons are major factors. Low incomes earned from agricultural produce have made the sector less lucrative, deterring farmers and the youth from engaging in it. Also farm yields are low due loss of soil fertility. to crown it, high cost of farm inputs such as fertilizers, seedlings farm tools make it difficult for poor and subsistence farmers to practice extensive agriculture.

Even the youth see agriculture as backward and would not venture into it. Most of them leave to the cities for white collar jobs. Agriculture is for the old and the poor farmers as they see it. In light of this, when migrants who are individual-oriented rather than communal-oriented come with better and challenging ideas on how to use the land, the farmers seeing it as economically wise, sell their lands to them. In a related way, Adjei (2010) observed that incomes accrued from lease of lands to private and estate developers are generally higher than those from agricultural purposes; hence, the preference of landowners to lease out lands for purposes other than agriculture. Similarly, the OECD (2009) stated that agriculture is a marginal profit activity and decline in the farming returns would cause production to cease in the long run.

Effects of peri-urbanization on agriculture land availability

Peri-urbanization as the name suggests, is the development of urban peripheries into urban areas. This is ultimately the conversion of arable lands into urban land uses (Deng *et al*., 2005). This therefore reduces the amount of arable lands available in the urban peripheries (Djurfeldt and Jirström, 2013). The consequential effects of this will be food insecurity and related effects in the peri-urban areas (Deng *et al.*, 2005). This is as a result of the high demand of farmlands for residential, commercial, recreational and industrial activities as urban centers expand outward toward the peripheries (Naab *et al.*, 2013; Ramankutty *et al.*, 2002).

In like manner, Hamamatsu (2002) opined that agriculture land conversion is occurring in most peri-urban zones across the world. His study of Japan observed that cropland has been reducing for the past decade. Though the reduction is at an insignificant rate of 1% per annum, the long term consequences could be grave for food security for the progressively increasing peri-urban population.

This is in congruence with the study of Busck *et al*. (2006) who espouse how land use change dynamics in urban settings have tendencies to affect other land uses including agriculture. This is as a result of the high demand for farmlands for residential, commercial, recreational and industrial activities as urban centers expand outward toward the peripheries (Naab *et al*., 2013; Ramankutty *et al*., 2002). Development of physical structures basically involves shifting of rural and agriculture to peri-urban (Isibor, 2013); in the long run, the anticipated outcome is to diversify the economy of a country. These outcomes have perceived negative implications on food productivity and hence the general rural livelihoods in the district.

CONCLUSIONS AND RECOMMENDATIONS

The study revealed that there is a progressive rate of peri-urbanization in the Asante Akim South District. Owing to the pressure on residential accommodation in the near-by cities, there has been increasing demand for land for residential and commercial land use purposes at the expense of arable land. Easy access to land and the gradual deterioration of rural economic livelihoods are some key determinants of agricultural land use conversions in the District. Therefore, the economic incentives expected from the conversion of agricultural land into residential and commercial land uses are the motivating factors for change. Agriculture as an economic activity is gradually losing its profitability among peasant households. The conversion of agricultural land use into other uses has become more lucrative in the short term to subsistence agriculture. These outcomes have perceived negative implications on food productivity in the district.

Conversion of agricultural lands cannot be avoided, especially considering the changing demand for land for uses other than agriculture. Population increases have put considerable pressure on the households' economic conditions that have necessitated some conversion of land from arable to commercial uses. These were ostensibly done, to 'diversify' the household income.

With the paucity of information on the changing agricultural land use in peri-urban areas, this paper serves as a policy prompt to the District Assembly to focus policy attention towards the protection and regulation of prime agricultural lands, as physical development cannot be avoided entirely. In this regard, the Ashante-Akim South District Assembly should step-up land use monitoring efforts in tandem with the lay-out land use planning schemes.

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Conflict of interest

Authors declare that there is no conflict of interest associated with this paper, in terms of its conceptualization and writing.

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