OGUAA JOURNAL OF SOCIAL SCIENCES (JOSS)

VERITAS NOBIS LUMEN

Customary Land Tenure, Investments and Livelihood Adaptation in Northern Ghana

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Abstract

The land tenure practice of any place is important for the economic well-being of its citizenry. This article assesses the investments of farmers on different categories of lands deemed to have less or more security in order to inform the debate on the relationship between tenure security and investments. We also delineate the changing livelihood portfolios of families resulting from changing access forms to land via livelihood adaptation. Quantitative data from a national survey conducted by the Institute of Statistical Social and Economic Research in addition to qualitative information from nine villages is used as evidence for the study. Investments in land tend to be constrained by a host of motivations and factors rather than just security. Poverty was the most important factor which prevented farmers from investing in a wide range of land improvements necessary for increasing productivity. As a result of pressure on land resources and scarcity of farmland in urban and peri-urban areas many, people are diversifying from agriculture to non-farm activities. In the rural areas, this pressure on land has led to migration by the youth to the cities and changes in land relations between land owners and other land users. The economic mix of northern Ghana is becoming complicated and in tune with global trends. The deagrarianisation trend does not automatically lead to improvement in people's livelihoods but is contingent on social, economic and environmental factors.

Introduction

Land tenure may be defined as the terms and conditions on which land is held, used and transacted . Livelihoods of many depend on the availability, user rights and level of security in holding a piece of land. The scarcity or abundance of land determines the ease of acquisition of land by the poor. The types of user rights embedded in the exchange affect the profits expected from the use of the land. The level of security or the risk of losing the land or experiencing arbitrary changes in contract with landlords affects the way land is used, and ultimately livelihood outcomes and environmental health. Land is no longer easily available because of the gradual intensification of the commodification of land arising from several factors whose sources are both internal and external to the Ghanaian economy.

Customary land tenure systems are fast evolving especially in peri-urban communities where residential needs compete with agricultural purposes. In low density rural communities with abundance of fairly good natural resources the pressures of monetisation is likely to be lower than in high density areas where competing needs for land lead to higher values and consequently the conversion of token customary gifts for land acquisition into monetary payments or higher exactions in the form of livestock and cash. The principle of communal ownership, with elders and chiefs holding land in trust for their populace is under severe attack by the forces of modernisation that is transforming traditional society to a capitalist one linked to global markets.

Changes in the Ghanaian economy mandated by colonialism moved in tandem with changes in tenure systems and social relations. Benneh traces the commodification and individualisation of land among the Akan to the introduction of cash crops, especially cocoa. This trend is said to have destroyed the solidarity of clan members inherent in the traditional land tenure system. Northern Ghana's history of ethnic conflicts has land being the principal cause for their occurrence which raises issues of wider security concerns.

Increasing population growth and migration from both rural areas and other parts of Ghana has led to a rising urban population. The rising level of demand for food and other natural resources also increases the demand for land in rural areas thereby causing changes in the customary tenure system. It is argued that these trends bring about insecurity in land ownership and affects the degree of investments in land. Inability to access land and embedded insecurities and complexities in land tenure arrangements is regarded as a land crisis. Also, we contend that since land is becoming a scarce commodity, people would seek a livelihood outside farming. Land tenure problems should therefore be seen as integral to the livelihood adaptation revolution in Africa rather than the current stress on the opportunities or pull factors being stressed in the literature. This article attempts to probe the prescribed links that exist between land tenure security and investments in land by farmers. We then examine the emerging trend of livelihood adaptation, teasing out the motives, drivers and aspirations of people affected by the land crisis.

Land Tenure In/Security and Land Investment

The discourse on the relationship between land tenure security and land investment can be traced to the polarization of positions regarding the in/security of rights of customary land tenure systems in Africa. Policy on customary land tenure may be understood in terms of two principal viewpoints . One position held by the World Bank and recently renewed by de Soto characterized customary land tenure as ambiguous and blames this for low productivity-enhancing investment on land. According to this viewpoint, customary land rights cannot be used as collateral against loans, and that land held under customary tenure is 'dead capital' . Proponents of this view argue that a fully-fledged private property right enhances investment incentives due to 'assurance, realisability, and collaterisations effects' associated with security of land rights.

The second position calls for the recognition and reinforcement of customary rights to land, and generally opposes land title registration, particularly individual title. Proponents of this position argue that land title registration favours the wealthy, and is against women, tenants and secondary rights holders, and that the realisability and collaterisation effects, claimed to be associated with registration of title cannot be supported by empirical evidence in Africa . Instead, they believe that development of land market results in distress sale of land by the poor in times of hardships, thus leading to social differentiation and landlessness among the poor. Finally, they argue that titling generally excludes secondary or seasonal rights that are likely to be important safety-net rights for the poor under customary tenure .

In a bid to support claims of their respective positions, many studies in Africa try to empirically establish the actual relationship between land rights and productivity, security of tenure and productivity, security of tenure and investment in different contexts.

In estimating the effect of tenure security on agricultural investment, the World Bank research on Ghana concluded that, tenure security has a clearly positive impact on investment in the region of Anloga, but less noticeable impact in Wassa and no impact at all in Ejura –. In Anloga, the ability to freely transfer land was positively related to investment in drainage or excavation improvements. In Wassa, tree crops were less likely to be planted on parcels on which farmers had only limited transfer right, yet the result was not significant.

Another study in Ghana by Twerefuor et al on tenure security, investment and the environment, using a national survey data gathered by ISSER, finds that investment in farmlands in Ghana is low and appear not to enhance tenure security, and that the reverse causation of tenure security enhancing investment seems non–existent. This implies that agricultural investment in the country is not security-induced and that investment is not an important determinant of tenure security. However, tenure security appears to be an incentive for investment in

that when they did not control for endogeneity, tenure security had a positive and significant impact on investment though the result is not robust. This implies that farmers with security of tenure are more likely to invest in their lands, which may eventually lead to higher productivity (Tweefuor et al, 2007).

A study by Goldstein et al (2006) in Akwapim in Ghana using fallow as investment, shows that individuals who hold powerful positions in a local political hierarchy have more secure tenure rights, and that as a consequence they invest more in land fertility and have substantially higher output. The intensity of investments on different plots cultivated by a given individual correspond to that individual's security of tenure over those specific plots, and in turn to the individual's position in the political hierarchy relevant to those specific plots (Goldstein and Udry, 2006).

Besley , re-working the data collected by the World Bank, and controlling for endogeneity, reached a conclusion that is opposite to that of Migot Adhola's (1994) study. He finds that, better land rights facilitated investment in Wassa but not in Anloga. These results were supported by a recent study in Uganda that concluded that investment enhances tenure security, yet the converse relationship is not true .

Another study by Brasselle et al also controlled for the endogeniety of land rights while assessing their impact on investment behaviour in a sample of villages in Western Burkina Faso. The result obtained by them, indicates that land tenure security is, indeed, strongly influenced by investment; and once this endogeniety bias is properly controlled for, increased land rights do not appear to stimulate investment. The same conclusion was reached by Baland et al when they applied the same methodology to their study of Central Uganda.

It is clear from the above discussions that there is no clear evidence of unidirectional relationship between tenure security and investment. The relationship appears to be bidirectional. It is an indication that, it is a difficult task to try establishing the impact of tenure security on investment behaviour

empirically. As a result of the varied conclusions arrived at by different studies, it is impossible to establish a universally accepted model linking tenure security and investment. To arrive at a universally accepted model there must first and foremost be a universally accepted definition of tenure security and investment, while at the same time, following a methodology that effectively controls for endogeniety of land rights, before any conclusion can be reached.

Land tenure changes and livelihood adaptation
The evolving land tenure practices in northern Ghana have deeper implications for the livelihood options people use. Changing rules of usage of rural lands affect the way land is used and whether people continue with farming or not. Similarly, dwindling agricultural lands in urban areas means that farmers have to assume new occupations to make a living. Conversion of farmlands to residential and urban use also comes with its social and economic consequences. The process whereby farmers are assuming new occupations is termed deagrarianisation. Bryceson defines deagrarianisation as a long-term process of occupational adjustment, income-earning reorientation, social identification and spatial relocation of rural dwellers away from strictly peasant modes of livelihood. Her book, *Farewell to Farms*, is about people who in one way or another are easing away from a strictly agrarian existence in Africa.

The multi-active nature of peasants reflects adjustments to socio-politico-economic and environmental forces as shown by the space of vulnerability . Several forces account for why people move from farming to non-farm activities, but the role of dwindling farmlands in urban areas is paramount. In rural areas, a combination of changes in rules regarding the use of land is a notable constraint in productivity. Where land is getting fragmented, constraining norms emerge that make people diversify the portfolio of family activities. Livelihood diversification is not a new phenomenon, but an age-old practice reflecting peasant ingenuity faced with adversity and opportunities. According to Ellis,

livelihood diversification is a process by which rural families construct a diverse portfolio of activities and social support capabilities in their struggles for survival, and in order to improve their standard of living. Diversification of one's livelihood could therefore be an indication of failure of previous livelihood strategies or a path to accumulation and investment in the future . Households and individuals diversify assets, incomes and activities in response to what Barrett et al. call 'push and pull factors'. In the case of land-induced diversification or deagrarianisation, push factors are of overriding importance. However, increasing urbanisation itself is a self-propulsive growth system that creates opportunities for livelihoods. Since many peasants are flexible in terms of training for new skills, they adapt to the new socio-economic realities facing them.

Push and pull factors are synonymous with Davies' (1996) survival and choice denoting necessity and choice. These two categories of explanation postulate risk management and coping strategies as responses. Risk management strategies, or insurance mechanisms, deal with *ex ante* processes, which are deliberate household strategies to anticipate failures in individual income streams by maintaining a spread of activities. Coping strategies, on the other hand, are responses to *ex post* shocks.

The rapid rate of land sales in peri-urban areas is bound to lead in the short run to the use of ex post strategies such as commuting to distant villages for farming. However, in the long term it is expected that farmers would have reasoned and understood the realities confronting them and made rational choices involving livelihood activities which they deem appropriate to increase their material well-being. Similarly, in rural areas, population pressure would introduce new mechanisms of land borrowing, share-cropping and monetary tendencies. The social system is not expected to remain intact as several studies already demonstrate that social capital in rural communities is on the decline as hardships emanating from structural adjustment and environmental stress turn kin to strangers .

Sources of data

The focus of the study is the administrative regions with special focus on the rural, urban and peri-urban locations in northern Ghana. The data for the study were extracted from the Land Tenure and Policy Research Project (LPRP) of the Institute of Statistical, Social and Economic Research (ISSER), which was sponsored by the United State Agency for International Development (USAID). The LPRP data as a whole consisted of: a national survey data, focus group discussion reports, in-depth interview reports and institutional survey reports. These data were collected from rural, urban and peri-urban locations in selected districts in each of the ten regions of Ghana. In addition to these data, a supplementary qualitative data was collected by the researchers from selected communities in the three northern regions.

The purpose of the qualitative data was to generate contextual data and gain deeper understanding of processes, institutions and mechanisms from the perspectives of land users and affected parties. Nine communities were involved in the qualitative data collection, namely Bamaahu, Kpaguri and Tabiesi in the Upper West Region, Gisonayili, Kpilo and Mashelgu in the Northern Region and Kajelo, Chiana, and Navrongo in the Upper East Region. In-depth investigations, employing focus group discussions and individual interviews with clan leaders, women, and the destitute/ultra-poor were conducted in each community. We conducted one focus group discussion in each community, both as an exploratory research tool for the purpose of exploring the community's thoughts, and a delineation of the nature of the land tenure systems. These discussions were useful in gaining a rapid understanding of key issues of controversy to be elaborated during the in-depth interviews.

Land Tenure Practices and Investment Patterns in Northern Ghana

As explained in the literature, secure rights to land are argued to bring productivity and environmental benefits through higher investments in land. The

picture in the study area is far from clear. The survey showed that a higher percentage of landowners compared to tenants invested in capital assets on their plots (see Table 1). This is logical in that landowners need to protect their land by having visible investments that prevent a communal outcry for sharing. This is especially true in the Upper East and Upper West Regions where land ownership is fragmented among several clans and families. Also, the land hunger emerging in these regions increases the incentive to secure landownership titles with elaborate investments in capital assets such as farm houses, access roads, irrigation, storage and rehabilitation.

It is useful to categorise land investments to enable us to ascertain the differential investment types engaged in by different people with differential security over the lands they use. We have (1) high capital fixed investments such as farmhouses, wells and access roads, and (2) fluid productivity enhancing investments such as inputs/technology, cash crops and trees. Landowners tend to dominate in both types of investment categories. There is, however, a relationship between wealth and capital investments. Wealth is related to land ownership, which in turn is determined by power and political position occupied within the community and household.

Table 1: Investments on land by different land rights categories in Northern Ghana

Region		Made major capital investments on land		
	Status in relation to plots of land use	Yes	No	Total
Northern	Land owner	13	30	43
	Tenant	10	57	67
	Using lineage land	4	20	24
	Both tenant and landowner	0	6	6
	Using lineage land and tenant	0	5	5
	Land owner, tenant and using lineage land	0	2	2
	Land owner and using lineage land	0	1	1
	Caretaker	0	1	1
	Total	27	122	149
Upper East	Land owner	28	142	170
	Tenant	2	14	16
	Using lineage land	3	21	24
	Both tenant and landowner	2	4	6
	Using lineage land and tenant	0	1	1
	Total	35	182	217
Upper West	Land owner	14	102	116
	Tenant	7	61	68
	Using lineage land	4	27	31
	Both tenant and landowner	1	7	8
	Using lineage land and tenant	0	1	1
	Land owner and using lineage land	1	5	6
	Total	27	203	230
Source: LPRP Survey 2005				

Table 2 shows that majority of tenants explain their low investments in capital assets on their lands as resulting from poverty rather than insecurity of land ownership which the literature conceptualises. The fact that Upper East Region which is the second poorest in Ghana had many landowners not investing in capital assets stresses the dominating effect of poverty in explaining patterns of investments in northern Ghana rather than tenure insecurity. Less than 12% of respondents cited tenure security as reason for not making capital investments.

It is important to note that the label landowners in the survey is mixed up since people in rural Northern Region, compared with the two other regions, claim to own the lands they cultivate until it is alienated by chiefs. There is therefore interchange of terminology with regards to rights to land with time.

·   While in Northern Region each rural household owns the farmlands inherited and would therefore invest in these, as time passes by and these lands acquire a commercial value, they become users, which suddenly increase insecurity of tenure and hence of land investments. But usually, such investments are transferred to new locations where farmers migrate. Farmers from Gisonayili have migrated or commute to new farms in Bemani where though they do not have ownership rights, feel secure enough to invest in farm sheds, access roads, storage, technology and means of transport (focus group discussion in Gisonayili). This is because land for agriculture is not sold and the rights to these lands are highly secure in Northern Region as long as they are bush lands in the frontier areas which would take decades before urban development reaches there. Also because these farmers are viewed as first settlers on those farmlands, they have owner-like rights, which can only be abrogated by the chief when the land is in demand by the state or capitalist interests. It is not possible for the chief to give it out to another farmer.

Table 2: Reasons for not making capital investments in land

Region	Status in relation to plots used	Reasons for not making investments						
		Could not afford	Insecure land tenure	Short term farm	Not Interested	Locational insecurity	Others	Total
Northern	Land owner	26		1	1	2		30
	Tenant	48	6	1			1	56
	Using lineage land	19	1					20
	Both tenant and landowner	4	1					5
	Using lineage land and tenant	4	1					5
	Land owner, tenant and lineage land	2						2
	Land owner and lineage land	1						1
	Caretaker	1						1
	Total	105	9	2	1	2		120
Upper East	Land owner	134	2	3		1	2	142
	Tenant	14						14
	Using lineage land	21						21
	Both tenant and landowner	3			1			4
	Using lineage land and tenant	1						1
	Total	173	2	3	1	1	2	182
Upper West	Land owner	98		1	1		1	101
	Tenant	54	2	2	1		1	60
	Using lineage land	27						27
	Both tenant and landowner	6			1			7
	Using lineage land and tenant	1						1
	Land owner and using lineage land	4					1	5
	Total	190	2	3	3		3	201

Source: LPRP Survey 2005

In the Upper East and West Regions, however, this rule does not apply. Only land given by the *Tendana* [3] accompanied by a sacrifice of transfer stays with the land user forever. All others are borrowers of bush lands with the Tendana reserving the rights to abrogate their user rights any time the need arises. Rights are however concrete in the Upper East and West Regions because there is the possibility for people to own these lands by negotiating with Tendana to alienate the lands to them, whereas in Northern Region the chiefs would not sell farmlands but would allow free and unlimited usage until commodification of land abrogate these rights.

We can therefore talk of a temporal dimension in tenure security in Northern Region. That terminologically increases the number of landowners even though theoretically they would be considered tenants. Farmers do not feel a sense of insecurity in these instances. Investments of the second type are higher on borrowed land while those of the first type are absent (focus groups in Kpilo and all sites in the Upper East Region). Women in Kpilo farming vegetables, rice and groundnuts on lands borrowed from family heads, husbands' friends, and elderly people explained that productivity enhancing investments such as cash crops, fertilising and use of tractors and hired labour was necessary to achieve high yields. Trees are however not planted as landowners perceived this differently-either as an attempt to claim ownership or as a capital and environmental investment. In any case, fixed capital investments cannot be put up without the landowner's permission.

The relationship existing between tenants and landowners is of overriding importance in the decision to invest in capital and environmental measures. Tenants who still stick to the traditional principle of honouring the

[3] "Tendana" – literal meaning: "tin", "tengan", "teng" means the land or the grove; "dana", "soba", "tina" means owner; means the owner of the land and groves. "Tendana" or "tindana" is the singular; "tendamba" the plural. The term is known as "tendamba" or "tengansoba" among the Walas and Dagaabas; "totina" among the Sissala; "tigatu" among the Kasena-Nankani; "tindana" among the Frafras and "teng-nyono" or "teng-nyam" among the Builsa. Tendamba are the descendants of the pioneer settlers of their respective villages and towns. The land tenure system therefore stems from discovery, settlement and inheritance. As representatives of the "earth god", and caretakers of the land, the tendamba are the "paramount" title holders to land in their respective villages and towns. (Kasanga 1999)

landowner and sharing in his sorrows and happiness have little fear of losing their lands except when the landowner's household is expanding beyond their available land. Even then, the whole land is never taken back because the tenant has also become family and no elderly person wants to be seen discriminating among a family. Two tenant participants at the focus group discussion in Kajelo indicated that they had good relationships with their landowners with synergistic benefits. This contrasted with five tenants who claimed that they had just lost their lands to landowners for both known and unknown reasons. One remarked thus: 'These days the sources of conflict are several and it takes one of them to sever the relationship between you and the landlord who has been looking for an opportunity to take back his land'. The falling levels of social capital have a relationship with security of tenure and willingness of tenants to invest in land. In all the research sites, people complained about the degradation of communitarian norms due to economic hardships and commercialisation of most transactions.

An examination of Chiralaga's story in Box 1 unveils the logic of investment patterns on owned and borrowed lands. While he would readily invest in fodder trees supplied by an NGO called ADRA on his own land, he is reluctant to do same on borrowed land for the obvious reason that he would have to share with the landowner who also has livestock. Refusal to share benefits could result in land being taken back. However, he puts the borrowed land to fallow when its fertility falls. This goes against the explanation that tenants do not fallow land for fear of losing it.

A landowner in Nogsenia said he would take back his land if the tenant is seen to be overusing the land without erosion control measures, maintaining new trees growing naturally and manuring or fallowing the land. There is some level of environmental consciousness on the part of tenants and owners. Owners do not want tenants to make their lands barren, while tenants try to increase their credibility by maintaining a good level of investments in land improvements. Yet

another group of tenants complained about landowners taking back land when they notice appreciable investments such as enhanced fertility and trees. This is attributable to greed or jealousy as landowners prey on the 'sweaty investments' of tenants. These pathways exist in all the research sites and it is difficult if not impossible to point to the dominance of the negative or the positive relationships. Generally, in more urbanised locations security of tenure for tenants is low and investments are poor, while in rural locations with low population densities security of tenure is high and investments by tenants parallel those by landowners.

Box 1. Chiralaga of Kajelo (50 years of age)

I am married to a third woman after my first wife died, and the second left me. I have 8 children, 4 of whom have migrated to the south. We are farmers and cultivate inherited lands from my father. We have also borrowed land which we use for groundnut cultivation. I only gave cola nuts for the land. The cola nuts do not represent payment but respect for the landowner because one cannot go empty-handed to a chief's palace to beg. The borrowed land helped me fallow my own land since it was overused and degraded. Now the borrowed land is also on fallow because its fertility is low too. I have investments such as trees supplied by ADRA on my lands which I use to feed my livestock. These are not planted on the borrowed land because it does not belong to me.
Land should be transferred permanently from landowners to those who need it rather than lending since the insecurity involved prevents people from realising the best from the land deal. Since land is both the physical crust and the plants on it, all those who use it should have access to everything. In that case their wives can also make supplementary money. Instead of 'charim' which is at the borrowing stage, we should move to 'kogsim' which is the traditional transfer to new landowners.

The key to maintaining good security is respect for landowner and reasonable investments on the land. These are however very difficult to measure as attitudes, moods and expectations change with time and context. This once again brings to focus the role of clarity and straightforwardness in current traditional transactions and dealings. The lack of these attributes and the inability to maintain traditional African norms that are mutating along a commoditised logic may not guarantee a positive outcome in the near future for the poor. Tenure security and investments are therefore not in an inverse relationship, neither are they necessarily positively correlated. Investments on land is used to increase tenure security on bush lands in Northern Region while investments on land

increases the credibility or trustworthiness of the tenant in the Upper East and West Regions which ensures secure use of land.

The important factors for agricultural productivity have to do with inputs for increasing soil fertility, labour and farm tools. These are dependent on financial capital, which is generally limited in the study area. That explains why both landowners and tenants register low investments. With the provision of small loans to women in all the regions, there has been an increase in female involvement in profitable farming. This is contrary to our initial postulation of a constraining androcentric society where women's insecure tenure arrangements with men mean low investments and productivity. A combination of tenure security and productive assets is key to sustainable livelihoods and improved productivity as seen from the general advocacy for easy mechanisms and rules for the transfer of land rights (focus groups in Kajelo). The freedom to do whatever one wants on a piece of land rather than fulfilling some social obligations towards a landowner certainly guarantees flexibility in productive effort that is most likely to improve sustainable livelihoods through higher productivity and environmentally friendly strategies.

Changing access to land and Livelihood adaptation

Changes in land tenure relations especially land sales have contributed to the multiplicity of livelihood strategies used in contemporary rural and urban Northern Ghana. The inability of people to acquire productive land or protect their right to land requires mediation in the form of changing livelihoods. The land crisis in urban and peri-urban Northern Ghana has deagrarianised the peasantry who can no longer find land to farm within reasonable distance. Women in Northern Region have intensified their non-farm income activities. The high cost of urban and peri-urban land excludes most people using land in improving their livelihoods. In Malshegu (Northern Region) a plot of land measuring 100ft by 100ft, cost inhabitants 2,000,000 to 2,500,000 cedis while strangers pay from

3,500,000 cedis upwards (interviews 2006). The survey showed that over 60% of respondents engaged in livelihood activities outside their own premises. This often requires the payment of fees for static activities by artisans and traders. Only hawkers avoid such payments. Ability to acquire land for operating small businesses is a major constraint to livelihood adaptation or the deagrarianisation drive.

Dispossessed land users basically employ coping and survival strategies initially until they establish niches within the new micro economic context. This has often been associated with heavier burdens for women to whom non-farm activities are associated (qualitative interviews 2006). Different people in different areas use different strategies or employ new livelihood options to cope with being displaced from the original livelihood activities associated with farming. Poor families in Gisonayili simply migrated to Bemani where social links enable them to access bush lands, while wealthier families acquired urban plots and engage in livelihood activities such as trading, salons, workshops and other artisanal activities. It is now imperative for most people in urban and peri-urban areas to acquire skills in non-farm activities. Women in rural areas are also being taught skills in a range of local manufacturing activities. Type of skills acquired and possibility to acquire these also determine the ability to diversify into secured activities. Secured activities are regarded as those that guarantee a livelihood for a family while an insecure one is palliative short term measure to cope with adversity.

Imoro's family strategy of training all his children in skills the new urban economic space demands is manifestation of a new era of 'join the train or perish' at least for those subsumed by peri-urbanisation (see box 2). Though he commutes to farm elsewhere, he still learns a new trade knowing the imminent danger that farming is no longer the way forward. Training children on the farm has mutated to training them in schools and on the job in workshops. There is a new economic orientation in town taming people along its dictates.

Box 2. Gisonayili: Imoro Gumi (chief barber: 60 yrs)

Married to one wife with 5 sons and 2 daughters. I used to farm around the village when lands were plentiful but now a part-time farmer cultivating a 4-acre plot at Gbanyamni. I grow yam, okra, rice and maize. There are many people also farming there so it still feels like when we were farming close to home. I am self-employed as a barber and recently won the title of chief barber of the village.

My children don't farm like I used to do on my father's land. They are learning new trades; two of them are learning carpentry and another steel bending. The rest are in school as education is the future for the young as jobs can only be gotten with a certificate. Urbanisation of our village resulting from land sales has been good because new jobs have appeared that provide more reliable income than farming.

I inherited the farmlands we used to farm in the village from my father but lost them all to the land sales. I got a plot from the chief for residential purposes. This was inevitable because it was a deliberate change from farming to residential and since the chiefs have the legal custody over the land we lose out. My new farmland was borrowed for free along traditional rules. So it is not a big problem but the distance involved in travelling each day or staying on the farm is the issue. From the farm I provide cereals and tubers whiles my wife buys ingredients from income earned from groundnut oil sales. Also our sons provide her with money for food from time to time. The urbanisation of the village is good as it has created more livelihood opportunities for our children and brought more enlightenment.

The decline of farming in the villages in Northern Region is translated into higher expectations on women who used not to farm but only assisted men in sowing and harvesting. Shea butter processing has become the major industry in the area with every practising woman owning an improved oven. The need to earn higher returns encouraged by activities of NGOs has infused efficiency into the processing of shea butter thereby increasing output and profits. Groundnut oil processing and rice husking are other activities women engaged in. These are however periodic, because the availability of raw materials, the sheanut and rice is on a seasonal basis.

Ramatu's life story (see box 3) delineates the move from farm-based livelihoods to non-farm activities as a result of the disappearance of their

farmlands and the poor yields from bushlands coupled with long distances. She stresses the emerging high demand for consumable goods such as cooking oil which she produces as alternative to farming with a positive future outlook using education as prime source of security for survival within the emerging socio-economic situation.

Box 3. Ramatu of Gisonayili (27 years of age)

Married to the village chairman (village committee on all issues) with two sons and two daughters and five adopted kids. My main income earning activity is groundnut oil processing. Sometimes I also make shea butter on a small scale. I started groundnut oil processing six years ago when my husband allowed me harvest his groundnuts from the farm as a start-up capital. Proceeds from the first batch have been used to finance the business. Profits are quite good but one needs to sell in large quantities in order to make a living. I tried petty trading before but profits were not good and people owed here and there making it unprofitable. Profit from the business is used for buying ingredients for food and also cater for the needs of children. Their educated uncles living in the city pay their school fees.

Since this village became urbanised, women's burdens have increased because crop output from the bush farms is not enough to take care of us. We therefore need to find alternative work to buy ingredients and sometimes even taking care of basic family needs. I don't know if our lives have improved or not because though we earn more money now it involves a lot of work and stress than our previous relaxed lives. I use to help with sowing and harvesting activities on the farm and also take care of household chores.

The future now depends on taking good care of our children. The fewer children we have the better because of the rising cost of education and general upkeep. Every one has to strengthen their income earning activities because the demand is high now.

Adapting to the realities of commodification of land, economic liberalisation, globalisation and population growth by diversifying has not been a rosy alternative to farming. Informants attributed their inability to maximise income in the non-farm economy as the result of lack of financial capital, fluctuating and low demand, poor skills and poverty. For most poor people the

limitation to adaptation stems from the inability to acquire skills and space for the new livelihood activities.

Migration to major urban areas in the country is a major option used by many. It is reported that there is no house without both male and female migrants (reported in all 9 research sites). Most females from Northern Region migrate to big cities and work as porters or *kayaye* while boys become agricultural labourers in plantations or metal scrap dealers. In the past, most people from this part of the country migrated southwards to the mines and export-crop zones where state policies have always focused on. In contemporary Ghana, the need to earn more foreign exchange in a liberalised world economy is all the more demanding for cheap labour. As more people in the south compared to those up north become educated, there is the need for more labour from the north and other deprived areas to fill up the gap in farming, mining and urban unskilled jobs. The train of migration from the north to the south will continue as long as the opportunities and perceptions of a better life continue to be associated with the south while new contingencies without ready responses continue to hit the north.

Conclusion

Land tenure practices are not uniform all over northern Ghana and this prevents any smooth general patterns emerging about the relationships between tenure security and investments. This is because each context determines a particular pattern which in turn is transformed by individual idiosyncrasies. Centralised states such as found in Northern Region have high level of insecurity in urban and peri-urban areas while their rural areas have high levels of security, but yet investments in rural areas is low for most people because of poverty or the ability to practice shifting agriculture which saves investments in land. In the acephalous areas of the Upper East and West Regions, a sketchy pattern emerges whereby tenants tended to avoid investments on borrowed lands because they are not sure if they would continue growing those lands in the years

to come. Mismanagement of lands by tenants is punishable by termination of grants, so this forces them to make minimal environmentally regenerative investments. Social capital is identified as important in maintaining security of tenure for tenants. Landowners, on the other hand, tend to invest on lands to demonstrate their interest in these lands. Poverty is the main enemy of land investments rather than just security. Poverty works synergistically with insecurity to constrain investments on land. The relationships are complex and require a nuanced and careful interpretation of evidence.

The response of people to the land crisis induced by land sales in urban areas and demand and population-induced pressure in rural areas is seen in the mix of activities they employ in making a livelihood. The amount of access to urban and peri-urban land is dependent on wealth which therefore precludes many hitherto land users from engaging in static non-farm activities enabled by urbanisation. It has also introduced new forms of exploitation through high rents, prices and social obligations and rules. However, the vibrant urban economy has also introduced new opportunities for employment in the construction and service sector though of limited reach to the landless.

Migration is the major source of relief after adapted livelihood sources fail to increase well-being in the rural and peri-urban areas. In the urban areas, livelihood adaptation and deagrarianisation are the major sources of relief. Land is not the only limiting factor to sustainable livelihoods as respondents everywhere complained of the low level of other assets such as financial, physical, human, social and political which are all intertwined.

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Public Spending, Growth and Poverty Reduction: A Dynamic CGE Analysis for Ghana

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Abstract

The objective of this study was to determine the differential impact of various government expenditures on economic growth and poverty reduction in Ghana using a dynamic computable general equilibrium model based on a social accounting matrix (SAM) for Ghana for the year 1999. Even though there is evidence to show that higher fiscal deficits resulting from the increase in public investment outlays 'crowd-out' some private investment by raising interest rates, the overall impact points to increased real GDP on a net basis by removing physical bottlenecks of infrastructure and thereby raising the factor productivity of private investment. Two main lessons can be drawn from this study. First, various types of government spending have differential impacts on economic growth and poverty reduction, implying greater potential to improve efficiency of government spending by reallocation among sectors. Second, governments should reduce their spending on unproductive sectors and rather give priority to increasing its spending on production-enhancing investments such as education, health and infrastructure.

Introduction

Ghana has reached the completion point under the enhanced HIPC Initiative of the World Bank and the International Monetary Fund (IMF) after joining the initiative in March, 2001 and reaching the decision point in February 2002. The implications of the completion point included creditors being irrevocably committed to debt relief. This means the Paris Club creditors would provide 100 percent debt stock cancellation on all loans contracted before June 6, 1999 (GOG, 2003). Within the Ghana Poverty Reduction Strategy (GPRS) framework, these benefits must encompass a broad based pattern of public sector spending on basic social services with special emphasis on health, education and infrastructure [4].

To achieve broad-based growth resulting in effective poverty reduction in Ghana, an investment in human capital has been defined and articulated among the top three top priorities of government within its broad Growth and Poverty Reduction Strategy (GPRS) framework (GOG, 2003). The efforts of the government of Ghana have already borne fruit, in that, the economy has in recent years witnessed an upsurge of its budgetary allocations to the social sectors such as health, education, and on infrastructure among other social services. Also, Ghana has in recent times embarked upon a wide range of educational and health reforms to provide the knowledge, capacity, skills and attitudes necessary for the challenges ahead. For example, as part of the reforms in the context of Education for All (EFA), the ministry of education on behalf of the government of Ghana is implementing the capitation grant policy towards free Compulsory Basic Education (FCUBE) programme which provides that all children of school-going age should be in school by the year 2015[5]. Ghana is also embarking on the ambitious project of a Universal Health insurance system, financed out of general taxes as well as beneficiary contributions, in order to protect all citizens against

[4] In its policy objectives as specified in the Growth and Poverty Reduction Strategy (GPRS II), the government indicated that growth will be pursued through expanded development of production infrastructure in, among others, energy, transport, water and communications (GOG, 2003)
[5] Though sources differ on actual enrolments, the policy of free universal compulsory basic education which was introduced in 1987 as well as the current capitation grant and school feeding programs in Ghana has raised primary enrolments over the years.

preventable and manageable diseases such as malaria, tuberculosis and HIV/AIDS. The ultimate anticipated outcome is to stimulate economic growth and reduce poverty.

There are however, serious concerns about effectiveness of public spending in many key areas for growth and human development, including education, health care, roads and other rural infrastructure in stimulating growth and poverty reduction (Aryeetey and Kanbur, 2004). Likewise, there is a widespread perception that poorer groups benefit less from public spending, both in the sense of poorer individuals and households and of poorer regions. An important question that arises concerns the extent to which the current strategy of increasing public spending in totality and on various components such as health, education and transport infrastructure constitutes a targeted means for accelerated economic growth and poverty reduction in Ghana.

Investigating the link between public spending and economic growth and poverty reduction also becomes important when one looks at it from the multiplicity of consequences, both intended and unintended involved in the process. The consequences include short-and long-run allocative efficiency, income distribution and welfare, fiscal and foreign exchange balances, sustainability of resource use, and political response (Sadoulet and de Janvry, 1995). For example, while it is clear that the current levels of spending are still inadequate for achieving the poverty-reduction goals, it is also obvious that the objective of low inflation creates a new tension that is well known in development macroeconomics. This has become one of the most important policy issues that Ghana has to grapple with in the search for pro-poor growth (GOG, 2003). Also, questions such as 'do we need to spend on priority activity one or two' or to whether public investment programmes needs to be kept to a minimum because of the argument that they crowd out private investment all need to be answered in reference to their expected impact on poverty. Again, in as much as public spending is a potentially powerful instrument for stimulating economic growth and fighting poverty, budgets are limited.

The afore-mentioned issues call for a better understanding of the constraints of poverty reduction in a relatively stable growth context and the transmission mechanism through which such public spending policies affect the poor, and the possible trade-offs that poverty reduction may entail regarding the allocation of scarce resources and the sequencing of policy reforms. A more comprehensive way of modeling the overall impact of fiscal policy changes on the economy is through dynamic CGE modeling. These models are well suited to explain the medium to long-term trends and structural responses to changes in development policy (Adjakayi, 1999). Unfortunately, most of the applied studies addressing such public spending policy options have not dealt with Ghana. Also, the few recent studies, such as Bhasin and Annim (2005) and Bussolo and Round (2003) were not that rigorous in their approach and tended to rely on the static CGE, which does not capture inherent time lags associated with policy interventions. This study is therefore an application of a dynamic computable general equilibrium model in a case study of Ghana.

The rest of the paper is structured as follows. The objectives are provided in Section 2 and this is followed up in Section 3 with a discussion on recent trends in governments' social spending in Ghana. The theoretical issues related to the topic and the methodology is discussed in sections 4 and 5. The results from implementing the dynamic CGE model are presented in Section 6 whiles the final Section 7 is devoted to a brief summary and conclusions from the study.

Objective of Study

The objective of the study is to determine the differential impact of various government expenditures on economic growth and poverty reduction in Ghana using a dynamic computable general equilibrium model. Specifically, the study examines the potential impact of the following categories of government spending (i) increased total government consumption spending (ii) increased total government investment spending (iii) increased education spending (iv) increased health spending (v) increased spending on road infrastructure.

Trends in Government Expenditure in Ghana

The discussion that follows is based on the paper by Wetzel (2000) which provides classification of expenditures in terms of public services, economic services and social services. Public services consist of expenditures on such items as government administration, foreign affairs, justice and internal security.

Table 1: Central Government Expenditure by Sectoral Category

	1957-66	1967-71	1972-82	1983-91	1992 - 96
(as a share of GDP)					
Public Services	5.4	6.0	4.3	2.9	4.5
Economic Services	9.0	4.9	3.9	2.4	3.4
Agriculture	2.0	1.4	1.6	0.6	0.3
Infrastructure	5.0	2.4	1.9	1.3	2.3
Other Economic Ser	2.0	1.1	0.4	0.5	0.8
Social Services	6.1	6.9	6.4	5.2	6.0
Education	3.7	4.2	3.6	3.0	4.4
Health	1.3	1.4	1.3	1.2	1.3
Other Social Expend.	1.1	1.4	1.5	1.1	0.3

Source: Adopted from Wetzel (2000)

Table 2: Central Government Expenditure by Sectoral Category (as a share of total expenditures and net lending-narrow coverage)

	1957-66	1967-71	1972-82	1983-91	1992-96
Public Services	22.3	28.1	22.9	23.0	20.7
Economic Services	37.4	22.5	20.9	18.7	15.8
Agriculture	8.4	6.4	9.1	4.7	1.3
Infrastructure	20.8	11.0	9.6	10.3	10.8
Other Economic Ser	8.2	5.1	2.3	3.7	3.6
Social Services	25.2	32.2	33.8	39.9	28.1

Education	15.3	19.6	19.1	22.9	20.3
Health	5.2	6.3	7.0	8.7	6.2
Other Social Expend	4.7	6.2	7.7	8.3	1.6

Source: Adopted from Wetzel (2000)

These expenditures were highest during the 1967-71 periods at 6 percent of GDP and 28 percent of all expenditures. The share of expenditure allocated to agriculture was at its highest during the 1957-66 periods at 2 percent of GDP and 8.4 percent of total expenditure. Since then, it has continually declined, reaching 0.3 percent of GDP and 1.3 percent of total expenditures in 1992-96. The second major item under economic services is infrastructure. This includes items such as roads, transport, storage and communication, power/electricity, and water and sanitation. Spending on infrastructure was 5 percent of GDP and about a fifth of total expenditures during the Nkrumah years from1957-66.

During the 1972-82 periods, the expenditure on infrastructure fell to an average of 1.9 percent of GDP and 9.6 percent of total expenditure. This increased to 2.3 percent of GDP and almost 11 percent of total expenditures in 1992-96. The third major category of expenditure is social services including education, health and other social expenditures. As a share of GDP, expenditure on social services remained fairly steady across the periods except from the 2000s. As a share of GDP, social expenditures declined with the onset of the ERP, but their share of total expenditure increased to around 40 percent. Across all time periods, within the social services, education has received the largest shares of resources. With an improvement of the economic situation in recent years, government expenditures and budgetary revenues started increasing. Poverty-related expenditures indicated positive trends as observed in Table 2 and is projected to rise to about 12 percent of GDP (World Bank, 2004).[8]

[8] Poverty-related expenditures for 1999 could not be obtained and is deeply regretted

Table 3: Poverty-Related Expenditure Estimates, 2002-2004

In % of GDP unless otherwise specified	2002	2003	2004
Total Poverty Related Expenditure 1/	4.8	6.5	6.9
As a % of Total Expenditure	21.7	27.3	28.5
Basic Education	2.8	3.6	3.3
Primary Health Care	0.6	1.0	1.5
Agriculture	0.2	0.2	0.3
Rural Water	0.1	0.1	0.2
Feeder Roads	0.3	0.5	0.4
Rural Electricity	0.1	0.1	0.2
Other Poverty Related Expenditure	0.7	1.2	1.1
Memorandum Items:			
Total Expenditures 2/	21.9	23.7	29.0
Total Expenditures 2/ (Billions of Cedis)	10,716	15,673	19,173
Nominal GDP (Billions of Cedis)	48,862	66,158	78,650

Source: Adopted from World Bank (2004). 1/. Excluding externally financed expenditures; 2/ Including externally financed expenditures and excluding interest

The Literature Review

Even though the long running debate in economic circles between the roles attributed to the market as opposed to extensive state intervention has almost become old-fashioned, it is worthwhile restating a few of the salient points. The arguments that seek to legitimize government interventions include both long recognized forms of efficiency-oriented interventions of market failure such as public goods, externalities, economies of scale imperfect competition, as well as the non-efficiency oriented interventions that has to do with issues like poverty reduction, income distribution, intergenerational equity and food security, and other forms of welfare.

Public investments in strategic areas can generally stimulate economic growth and also affect the poor in a number of ways. First, fiscal policy influences the macroeconomic balances, fiscal and trade deficits and the rate of inflation. These changes affect standards of living directly (changes in real incomes) and indirectly (change in growth). Second, public investments in areas such as energy, rural roads, irrigation and primary schools often stimulate private investment and create opportunities for the poor to create, own, and accumulate assets and to smooth consumption (Vandemoortele, 2004). Finally, public expenditures generate transfers, in form of cash or monetary transfers (pensions, unemployment, insurance) or in kind (publicly provided health, education, and infrastructure services).

In as much as the justification for a robust role of government is attractive, it is important to note that economic theory indicates that such an expansion of government can negatively affect growth through inefficiencies created by government expenditures and the means of financing these expenditures (Schaefer, 2006). According to Mitchell (2005), government spending can interfere with competitive markets by establishing a "third-party payer" problem that disconnects end users from costs. This creates a lack of concern about prices that undermines competitive markets and increases inefficiency. The government cannot also spend money without taking it from someone through taxes. These taxes have the potential of discouraging productive activities by imposing a cost on work, savings, and investment. Borrowing to finance public spending also requires future payment eventually, implying a future tax burden, and diversion of investment resources from the private sector (Schaefer, 2006).

The empirical literature on the impact of various types of government spending on economic growth is mixed. The well-known study by Barro (1991) finds that "the ratio of real government consumption expenditure to real GDP has a negative association with growth and investment." Schaefer (2006) documents the study by Bernhard Heitger who examines the impact of government expenditures in 21 OECD countries from 1960 to 2000. The paper notes a substantial growth in average government expenditures over that period and a corresponding decline in average economic growth. Tanzi and Zee, according to

(Schaefer, 2006) also find no relationship between government size and economic growth. A National Bureau of Economic Research study concluded that "An increase in government spending by 1 percentage point of trend GDP decreases profits as a share of the capital stock by about a tenth of a percentage point" (Schaefer, 2006).

There are also a number of studies that have reported positive impacts of the relationship between government spending and growth and poverty reduction.Vandemootele (2004) argues that public investment was a key instrument to fostering growth and reducing human poverty in the Republic of Korea and still plays that role in China and Vietnam[7]. There is also evidence that national investments in agricultural research and rural infrastructure also contribute to agricultural and rural non-farm economic growth and to rural poverty reduction in their own right, even when markets are not widely liberalized (Fan, Hazell, and Thorat 1999; Fan, Zhang, and Zhang 2000).

Pasha and Palanivel (2004) in their work on 'pro-poor policies' argue that during the 1980s, China's agriculture-led development strategy sparked off on historically unprecedented reductions in poverty. According to the paper, farmers benefited from earlier state investment in rural physical infrastructure and basic health and education. The consequence was a surge in pro-poor growth. Easterly and Rebelo (1993) also show that an increase in public investment in transport and communication by 1.7 percentage points of GDP will raise growth by one percentage point. Gertler and van der Gaag (1990) document many studies which among other objectives indicate the correlation of health care expenditures on economic growth. Other studies include Fan, Hazell and Thorat (1999), Chu et al (2000), Addison and Rahman (2001).

Extensive evidence also exists on the positive effects of public investment on poverty and growth from studies that use CGE models. The literature is almost difficult to draw together and includes such studies by Bhasin and Annim (2005), Karl (2004), Wobst and Mhamba (2004), Agenor et al. (2004), Anderson (2003), Obi (2003), Bautista and Thomas (2000), Chitiga (2000), Bussolo and Round

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[7]These two countries are top performers vis-avis the MDG targets.

(2003), Boccanfuso et al. (2003). All these studies in part explain, at least, the political will of many governments to increase public expenditures on education, health and other development activities so as to reduce poverty. But whether or not this hypothesis holds in the Ghanaian situation within a dynamic computable general equilibrium framework remains to be validated and forms the main concern this study seeks to address.

Methodology
The Static and Dynamic CGE

ModelThe model used in this study is based on the standard static and dynamic CGE model developed by Löfgren et al. (2002). The model structure has two major parts: the main iteration that determines equilibrium for the current year and the updating part, in which the exogenous variables of the main iteration part are updated (for iteration of the following year) as functions of the equilibrium solution of the previous period. The static CGE model can be described as the within period module that defines the behaviour of public and private agents who choose their optimal level of consumption and production on the basis of relative prices. All producers (each represented by a sector or activity) are assumed to maximize profits subject to their existing technology, taking prices (for their outputs, intermediate inputs, and factors) as given. The production technology is represented by a set of nested constant-elasticity-of-substitution (CES) value-added functions and fixed (Leontief) intermediate input coefficients[8].

Household consumption is assumed to be distributed over composite goods, which are a mix of domestic goods and imports, according to a Linear Expenditure System (LES) demand functions. Fixed investment demand is defined as the base-year fixed investment multiplied by an adjustment factor. Government consumption demand, in which the main components tend to be the services provided by the government labour force, is also defined as the base year quantity multiplied by an adjustment factor. The competitive equilibrium in

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[8] See Lofgren et al (2002) for details on the complete listing of the model equations and assumptions as well as a schematic representation of the structure of the model.

this model exists and is given by the set of prices of consumption goods, wage rate of labour, rental rate of capital, and the levels of output, sectoral use of labour and capital, such that market clearing conditions are satisfied.

In the dynamic model, a time element is introduced by solving the model sequentially, updating the capital stock to simulate population growth and productivity parameters to simulate advances in technology. In the base, run labour stock evolvement is connected to population growth, which is adjusted to account for HIV-AIDS growth rates in Ghana. Accumulation of capital is assumed to be endogenous and depends on the stock of the previous period, investments and the depreciation rate. In the model, all agents are myopic which means that they do not make their decisions with regard to future expectations but base their decision making on current economic conditions. The model is solved for each consecutive period thus creating a data set for each of the periods in the horizon, which contains economy-wide data on micro and macro levels plus evolvement of stocks that are allowed to change over time.

Description of the Dataset-The 1999 Ghana SAM

The model dataset is based on the 1999 SAM for Ghana prepared by Bhasin and Annim (2005), and has been substantially modified for the present application. The modification of the SAM involves straightforward aggregations of the capital transactions accounts into a single 'savings-investment' account and a consolidation of the primary, secondary and use of income accounts into one single set of current accounts for institutions. In addition, the production accounts are initially disaggregated into six sectors or activities namely cocoa, other agriculture, manufacturing, other industry, transport services and other services. These activities in turn produce three commodities namely agriculture, industry and services. This distinction between activities and commodities allow individual activities to produce more than a single commodity and conversely, for a single commodity to be produced by more than one activity.

Instead of a single representative labour category, segmentations based on gender and skill level of workers are introduced, and comprise four groups. They are labeled in the SAM as skilled male labour (LABSM), skilled female

labour (LABSF), unskilled male labour (LABUF) and unskilled female labour (LABUF). This labour classification is important to examine the consequences of policy measures on 'factorial' income distribution. Institutions have also been grouped into four: households, enterprises, government and the rest of the world. Firms comprise non-financial corporations, financial corporations and non-profit institutions serving households. Domestic production by enterprise is assumed to require intermediate inputs from itself and from all other productive sectors and value added from the four categories of factors of production and capital. The capital factor income is shared between the households and enterprises while the factor income is entirely versed with households. Enterprises pay dividends to households and taxes and dividends to the government, and the remainder also goes into the saving account.

The household classification adopted in the SAM consists of two-level disaggregations, the first level being a distinction according to the type of economic activity of the household. The five household groups here are agricultural farmers (HAF), public sector employees (HPUSE), private sector employees (HPRSE), non-farm self employed (HNFSE), and non-working households (HNW). The second level is a distinction between rural and urban households. The gross income of the households consists of the payments to the factors of production and transfers from other institutions (enterprises, government and the rest of the world). This income is used for final consumption, for transfers to enterprises and to the government (including the direct taxes). The remainder is saved.

The leading role of government is handled by an explicit formulation of the tax financing and expenditure. In the SAM, the government is disaggregated into a core government account and different tax accounts, one for each type of tax. The tax account consists of indirect taxes on production, import tariffs and direct income taxes. The sources of revenue to government are transfers from other institutions. The balance of the current account of the rest of the world corresponds to the saving of this account. The overall classification of accounts therefore leads to a total of 27 accounts. The main source of information was obtained from the Ghana Living Standards Survey (GSS, 2000), which provided

the raw data. Data for other endogenous variables, which could not be tracked from the SAM, were obtained from other secondary sources including the International Financial Statistics and the Ghana Statistical Service. The size of the capital stock was estimated on the basis of value-added and gross capital income data in the SAM.

Implementing the Model & Data

Three main steps are involved in the CGE analysis: (a) the compilation of base data (SAM); (b) the calibration of model parameters to the base data; and (c) computation of counterfactual equilibria for the policy changes to be analyzed. The 1999 SAM was used to calibrate the model's parameters. Some parameters such as international trade elasticities were estimated from a reasonable mixture of evidence from countries with productive structures similar to the Ghanaian case [9].

In order to bring about balance in the macro accounts, it is necessary to specify a set of mechanisms or macro 'closure' rules. For the government, consumption is fixed in real terms. For most simulations, tax rates are also fixed, with savings clearing the government account. For the current account of the balance of payments, a flexible exchange rate adjusts to maintain a fixed level of foreign savings. In other words, the external balance is held fixed in foreign currency. There is no explicit modeling of the investment decision or the financial sector within a particular time-period, but aggregate savings-investment equality is required. Nominal investment is a fixed share of nominal absorption meaning that, other things being equal, real investment will respond positively (negatively) to decreases (increases) in the prices of investment commodities relative to other commodities. Finally, the base year for the model is also the base year for the price indices, which was equal to one.

The estimated and calibrated parameters must reproduce the data for the base year. This condition was satisfied. The model solution to the base year and calibration was then used to run the simulation of policy changes. The CGE model was implemented and calibrated using the General Algebraic Modeling

[9] See Appendix for estimates of various elasticities used in this study

System (GAMS) programming software. Policy impacts are compared to the situation observed in the base year in terms of sectoral outputs, macroeconomic aggregates, and poverty levels. Poverty, in this study is defined according to per capita real expenditure. Following a shock to the model, the model generates real growth rates in per capita consumption expenditure for the five categories of households in the economy, which is then applied separately to the per capita consumption expenditure of households in the survey data for the poverty calculation using the Foster, Greer and Thorbecke (1984) class of poverty measures defined as:

$$Pov_{h,k} = \int_z \left[(z - y_h)/z\right]^k f(y_h)dy_h, \quad k = 0,1,2$$

Where y_h is the income of household h, k is a poverty aversion parameter, z is the endogenously determined poverty line. The incidence of poverty is indicated by $k=0$, the depth of poverty is indicated by $k=1$ and the severity of poverty is indicated by $k=2$. [10]

Dynamic CGE Simulation Results
In this section, the dynamic CGE model (run up to the year 2010 from 1999) is used to assess the growth and income effects of (i) increased government consumption expenditure (ii) increased public investments (iii) increased health spending (iv) increased education spending and (v) increased spending on road infrastructure. [11] In the SAM, total government spending is made up of consumption expenditure (comprising mainly of government services such as public administration and social services), transfer payments to institutions plus investment spending (capital or development expenditures). In all of the cases of the experiments, an important question or consideration for the government is how to finance such spending. The range of simulation experiments together with

[10] The poverty lines for the calculations were drawn from Bhasin and Anim (2005). Assuming different initial poverty lines for the rural and urban sectors (expressed in monetary units and adjusted over time to reflect increases in rural and urban price indexes), and using the new absolute nominal levels of income and consumption for each individual and each group, the model will calculate a poverty index, and a poverty gap index. Two nutritionally-based poverty lines drawn from the Ghana Living Standards Survey (GLSS 4) were used for the base year - a lower poverty line of 700,000 cedis per adult per year and an upper poverty line of 900,000 cedis per adult per year.

[11] The percentage increase in all of these scenarios for the simulations was arbitrarily set at 20 percent.

some underlying assumptions follow the ones employed by Lofgren, Thurlow and Robinson (2004) for Zambia and Levin and Mhamba (2005) for Tanzania. The GAMS outputs for these simulations are summarized in Tables 3-5. Although the model reports annual changes in a number of variables, the report here is based only on the average annual change for the whole period. [12]

Increased Government Consumption Expenditure Simulation

Under this scenario, the effects of an increase in total government consumption expenditures on overall growth and poverty reduction is assessed. Given the assumption that direct taxes are fixed under this scenario, the initial impact of the increase is to decrease government savings. Since the model is savings-driven, the decreased savings leads to a crowding out of private investment by 4.26 percent and consequently to a reduction in real GDP. Given the compositional differences in government consumption spending, the increased demand for government services has different consequences for different sectors. The compositional changes in production towards government expenditure increases demand for and output of those sectors whose commodities feature in the government consumption bundle.

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[12] The base path growth rates were generated based on the following assumptions: Agriculture is assumed to grow at 5.4 percent; industrial activities grow at 6 percent, while services are assumed to grow at 6 percent over the period. Government real current expenditure is assumed to grow by 3 percent and total investment is assumed to be growing at 10 percent with private investment growning faster than public investment. Export volumes are assumed to grow by 8.2 percent while imports are growing by 6.9 percent

[13] The abbreviations represent the following: Gov Exp Inc: 20 percent increase in government consumption expenditure simulation, Gov Inv Inc: 20 percent increase in government investment simulation; Infras Inc: 20 percent increase in government spending on infrastructure simulation

Table 3: Base Values and Simulation Results (Average Annual Percentage Change) [13]

Sector	Initial Values	Base Scenario	Gov Exp Inc	Gov Inv Inc	Infras Inc
Real GDP	4513.17	7.70	7.55	7.84	7.64
Household Consumption	4340.24	4.32	4.07	4.43	4.23
Rural Consumption	1876.20	3.98	3.69	4.07	3.87
Urban Consumption	2464.04	4.57	4.36	4.69	4.49
Investment	868.47	2.37	-0.07	1.26	0.91
Government Consumption	710.52	3.00	4.0	3.00	3.23
Real Exports	533.95	9.73	10.05	10.15	9.87
Real Imports	1087.11	4.33	3.21	4.10	3.91
Real Exchange Rate	100	4.95	5.58	5.22	5.21
Investment/GDP	16.22	1.15	-4.26	-0.60	-0.80
Private Savings	0.09	-0.02	-0.02	-0.02	-0.02
Government Savings	9.82	1.41	-1.36	0.94	0.55
Foreign Savings	8.82	-3.14	-2.75	-3.09	-2.99

Source: Simulation Results

From Table 4, the expenditure increase leads to a slight increase (0.1 percent) in agricultural growth and services (0.1) but reductions in the growth of industry (0.9 percent). The fall in real GDP reduces the demand for imported commodities by 1.12 percent. The trade balance is maintained through a nominal depreciation in the currency (0.63 percent) which facilitates an increase in exports by 0.32 percent.

Table 4: Sectoral Production Base Levels and Simulation Scenarios

(Average Annual Percentage Change)

	Initial Values	Base Scenario	Gov Exp Inc	Gov Inv Inc	Infras Inc
Agriculture	2816.8	10.2	10.3	10.5	10.2
Industry	2628.4	6.0	5.1	5.9	6.0
Services	2440.4	4.7	4.8	4.9	4.8
Total	7885.6	7.3	7.1	7.4	7.2

Source: Simulation Results

On one hand, the increase in government spending should lead to a rise in the demand for factors and put an upward pressure on factor returns. However, given the fixed supply of these factors, the crowding out of investment forces a downward pressure on real returns to factors. The net effect from Table 5 shows a reduction in real household incomes and hence a fall in real per capita consumption for all the household groups, except the public sector employed (HPUSE) group. This, together with the investment crowding out effect drives down the real GDP. Accordingly, the incidence, depth and severity of poverty as shown in Tables 9 and 10, increase for almost all the household groups with the exception of public sector employed households.

Table 5: Base Values & Simulation Scenarios: Real Household Consumption (Average Annual Percentage Change) [14]

	Initial levels	Base scenario	Gov Exp Inc	Gov Inv Inc	Infras Inc
HAF	1015.8	4.2	4.1	4.4	4.1
HPUSE	880.8	5.9	6.0	6.1	5.8
HPRSE	756.0	5.9	5.7	6.0	5.8
HNFSE	827.3	4.9	4.9	5.1	4.8
HNW	860.4	5.8	5.3	5.8	5.7

Source: Simulation Results

Increased Public Investment Spending Scenario

In this policy scenario, outlays on current government consumption are assumed to be fixed while we explore the effects of increased public investments (Gov Inv Inc) on overall growth and poverty reduction. Such capital investments reinforce capital intensity (i.e. capital per worker) and thus have a formidable positive effect on productivity. This is in line with the theory of production where, productivity performance is tied to capital inputs or capital deepening (Mitchell, 2005). It further stimulates job creation and increases the profitability of the targeted sectors. Again, given the compositional differences in government investment spending, the change has different consequences for different sectors. Except for the industrial sector that shows a fall from 6.0 percent to 5.1 percent, the shift towards public capital expenditures in this policy scenario has a positive impact on the output of agricultural and service sectors. Overall real GDP increases to about 7.9 percent from the base growth of 7.7 percent.

[14]The abbreviations represent the following: HAF: agricultural farmers' households, HPUSE: Public sector employed households; HPRSE: private sector employed households; HNFSE: non-farm self-employed households; and HNW represents non-working households.

Intersectoral linkages and endogenous price feedbacks within the model capturing the full repercussion mechanisms in the economy of the increase in investment spending (together with an initial crowding out of private investment from 9.3 percent to about 4 percent) show a trade balance that is maintained through a nominal depreciation in the currency about (0.3 percent) which facilitates an increase in exports from 9.7 to 10.2 and a fall in imports from 4.3 to 4.1 (see Table 3). In the end, the investment spending policy scenario showed welfare gains for all the household groups. The welfare gains are mostly achieved through a rise in households' capital income gains.

Increased Education Spending Simulations

The remaining policy scenario involves a shift towards targeted specific spending in education, health and infrastructure which has been necessitated by the need of expanding these services in line with the GPRS (GOG, 2003). In the analysis on increased education spending, three alternative scenarios are considered. In the first scenario (Educ), the investment is assumed to be non-financed; in the second case (Educ-T), financing is done through increased taxes, and finally, Educ2 shows the case of increased spending on education with higher total factor productivity growth. The results from the education scenarios are summarized in Table 6.

Table 6: Base Values and Simulation Results (Average Annual Percentage Change) [15]

Sector	Initial Value	Base Scenario	Anti-Aids	Anti-Aids-T	Educ.	Educ-T	Educ 2
Real GDP	4513.17	7.70	8.19	8.65	7.81	8.05	9.20
Household Consumption	4340.24	4.32	4.55	5.01	4.29	4.35	5.77
Rural Consumption	1876.20	3.98	4.01	4.66	3.87	4.01	5.42
Urban Consumption	2464.04	4.57	4.95	5.27	4.60	4.61	6.02
Investment	868.47	2.37	-12.65	2.37	-1.11	3.33	3.36
Government Consumption	710.52	3.00	6.34	6.34	4.28	4.28	4.28
Real Exports	533.95	9.73	11.57	10.64	10.67	10.17	11.47
Real Imports	1087.11	4.33	1.74	5.11	2.82	4.71	5.48
Real Exchange Rate	100	4.95	6.84	5.01	6.04	5.03	5.42
Investment/GDP	16.22	1.15	-5.08	6.39	-5.33	2.24	0.93
Private Savings	0.09	-0.02	-0.03	-0.03	-0.02	-0.03	-0.02
Government Savings	9.82	1.41	-7.10	0.67	-2.25	2.64	1.75
Foreign Savings	8.82	-3.14	-2.45	-3.52	-2.66	-3.27	-3.66

Source: Simulation Results

[15] The abbreviations represent the following: Anti-Aids-T represents Anti-aids policy scenario, Anti-Aids-T represents the tax-financed anti-aids policy scenario. Educ represents non-financed increased education spending policy scenario, Educ-T represents increased education spending with flexible direct taxes, Educ-2 represents increased education spending with higher Total Factor Productivity (TFP) elasticity with respect to education

Given the assumption that direct taxes are fixed in the first scenario (Educ), the initial impact of the increase is to decrease government savings. This leads to a crowding out of investment and consequently to a reduction in real GDP as well as sectoral production growth rates. For the publicly funded scenario (Educ-T), government consumption is seen to increase from 3 percent to about 4.3 percent. The increased economic growth leads to an accelerated investment growth rate. The rising investment demand increases import demand as well as exports alongside the increase in GDP.

The scenario where additional spending in the sector is complemented with TFP increases (Educ2) has the largest impact. Sectoral production levels increase with higher growth rates being demonstrated for the services sector followed by the agricultural and services sector.

Table 7: Sectoral Production Base Levels and Simulation Scenarios (Average Annual Percentage Change)

	Initial values	Base scenario	Anti-Aids	Anti-Aids T	Educ	Educ-T	Educ2
Agriculture	2816.8	10.2	11.5	11.0	10.7	10.4	11.8
Industry	2628.4	6.0	3.9	6.6	4.9	6.4	6.9
Services	2440.4	4.7	5.4	6.2	4.8	5.2	6.5
Total	7885.6	7.3	7.5	8.2	7.3	7.7	8.7

Source: Simulation Results

Looking at welfare (approximated here as changes in real per capita consumption), the results from Table 8 show an improvement in welfare for all the household groups with private sector employed households benefiting more from enhanced productivity through education policy.

**Table 8:   Base Values & Simulation Scenarios: Real Household
Consumption (Average Annual Percentage Change)**

Initial values		Base scenario	Anti-Aids	Anti-Aids-T	Educ	Educ-T	Educ2
HAF	1015.8	4.2	4.7	4.9	4.4	4.2	5.7
HPUSE	880.8	5.9	6.0	6.6	5.7	5.9	7.3
HPRSE	756.0	5.9	6.2	6.6	5.9	6.0	7.4
HNFSE	827.3	4.9	5.7	5.6	5.2	4.9	6.3
HNW	860.4	5.8	5.4	6.5	5.4	5.8	7.2

Source: Simulation Results

Increased Health Spending Scenario- the case of HIV/AIDS Treatment
HIV/AIDs is assumed to influence the real economy through its effect on the
growth rate of the population, labour force and total factor productivity. The initial
task here involved the estimation of the total cost of the government HIV/AIDS
treatment programs. In this experiment, an estimated cost for an antiretroviral
therapy was assumed to be around 50 percent of the total budget [16]. The Anti-Aids
scenario (costless treatment) assesses the impact of minimizing the AIDS impact
without requiring any intervention from government through increased taxation.
Government consumption growth increases from 3 percent to 6.4 percent. This
results in decreased government savings and leads to a crowding out of
investment. The rate of real investment falls as a result but not to such an extent
as to diminish the positive gains in real GDP growth rate of 8.2 percent compared
with the base case of 7.7 percent.

A similar effect is shown at the sectoral level (Table 7) with reductions in
growth levels for industry from 6.0 percent to about 4 percent and increases for

[16] The main calculations on the estimation of the total cost of government treatment programs were drawn from Levin and Mhamba (2005) The underlying assumptions included 30% coverage and the fact that HIV/AIDS treatment program will increase population, labour force and total factor productivity growth rates.

agriculture and services, with growth rates of 11.5 from 10.2 and 5.4 from 4.7 respectively. The increase in real GDP is also reflected in increases in the demand for imports alongside exports. The results in terms of per capita real consumption of households' growth rates show increases for all the households groups with the exception of non-working households that posts a fall.

The results from the publicly funded HIV/AIDS scenario shows that increased TFP from such an intervention allows production to increase and consequently increases the level of GDP. Government consumption growth again increases, rate of real investment growth remains constant while total household consumption increases. On the sectoral level, the growth acceleration is spread across the three main sectors, with higher resulting growth levels for the services sector followed by agriculture and then the industry in that order. Welfare gains are higher for all the household groups posting average gains of about 0.7 percentage points.

Table 9: Poverty Measures for the Base Year and Simulations

	HAF	HPUSE	HPRSE	HNFSE	HNW
Poverty Incidence (alpha=0)					
Base	17.29	19.28	25.36	21.04	20.00
Gov Exp Inc	17.93	19.01	26.12	21.04	21.59
Gov Inv Inc	16.94	18.73	24.99	20.35	20.00
Anti-Aids	15.80	19.00	24.30	18.53	21.25
Anti-Aids-T	15.24	17.50	23.02	18.81	18.13
Educ	16.25	19.86	25.36	20.02	21.25
Educ-T	17.29	19.28	25.00	21.04	20.00
Educ2	13.42	16.03	20.83	17.01	16.59
Infras	17.63	19.56	25.73	21.40	20.30

Table 10: Poverty Measures for the Base Year and Simulations

	HAF	HPUSE	HPRSE	HNFSE	HNW
Depth of Poverty (alpha=1)					
Base	7.15	9.02	9.85	8.56	7.99
Gov Exp Inc	7.29	9.43	10.14	8.56	8.62
Gov Inv Inc	6.88	8.89	9.71	8.28	7.99
Anti-Aids	6.52	8.89	9.44	7.54	8.49
Anti-Aids-T	6.30	8.19	8.94	7.65	7.06
Educ	6.89	9.29	9.85	8.15	8.49
Educ-T	7.15	9.02	9.71	8.56	7.99
Educ2	5.55	7.50	8.01	6.92	6.63
Infras	7.29	9.15	9.99	8.71	8.11
Severity of Poverty (alpha=2)					
Base (in %)	4.16	5.30	5.41	4.96	4.30
Gov Exp Inc	4.24	5.54	5.57	4.96	4.64
Gov Inv Inc	4.01	5.22	5.33	4.80	4.30
Anti-Aids	3.79	5.22	5.18	4.37	4.57
Anti-Aids-T	3.66	4.81	4.91	4.43	3.89
Educ	4.01	5.46	5.41	4.72	4.57
Educ-T	4.16	5.30	5.33	4.96	4.30
Educ2	3.23	4.41	4.44	4.01	3.56
Infras	4.24	5.38	5.49	5.05	4.36

Source: Author's Calculations

Increased Transport Infrastructure Spending Simulation

This simulation (Infras-T) involved the doubling of government consumption and investment in transportation, assumed to be financed through an increase in direct taxes. The simulation results, together with the non-publicly financed scenario (not shown) appeared not to produce any significant changes compared with the base in terms of real GDP growth, sectoral production growth rates (except for a slight 0.1 percentage point increase for the services sector) and real household consumption growth rates. [17]

[17] The Infras-Inc simulation did not produce significant changes from the base scenarios and as such was excluded from the presentations in tables 9 and 10

Concluding Remarks

Two main lessons can be drawn from this study. First, various types of government spending have differential impacts on economic growth and poverty reduction, implying greater potential to improve efficiency of government spending by reallocation among sectors. Second, governments should reduce their spending on unproductive sectors and rather give priority to increasing its spending on production-enhancing investments such as education, health and infrastructure. This type of spending not only yields high returns to agricultural production, but also has a large impact on poverty reduction since most of the poor still reside in rural areas and their main source of livelihood is agriculture. In concluding, it is significant to mention that the findings from these analyses are entirely conditioned by the data used and model specifications and should be interpreted as such. However, additional sensitivity analysis in substitution and transformation elasticities, which are the core parameters of the applied CGE approach, indicates an acceptable robustness of the modeling results obtained.

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Appendix 1: Table AI: Social Accounting Matrix for Ghana 1999 (Billions of Cedis)

	ACOCOA	AOAGRG	AMANUF	AOINDG	ATRANSG	AOSERG	CAGRG	CINDG	CSERG	LABSM	LABSF	LABUM	LABUF
ACOCOA							504.1						
AOAGRG							2017						
AMANUF								972					
AOINDG								1805.2					
ATRANSG									350.2				
AOSERG									1981.7				
CAGRG	56.6	226.5	59.2	109.9									
CINDG	26.7	107	251.5	467.1	58.5	329.5							
CSERG	44.5	178.2	66.2	123	85.4	483.6							
LABSM	70	280.2	52.5	97.5	32.4	183.5							
LABSF	3.5	14.1	2.6	4.9	1.6	9.2							
LABUM	217.2	868.7	162.8	302.3	100.4	568.8							
LABUF	59.6	238.2	44.6	82.9	27.5	156							
CAP	11.1	44.6	168.2	312.3	43.6	246.8							
HAF										156.2	7.8	484.4	132.8
HPUSE										150	7.5	465	127.5
HPRSE										132.3	6.6	410	112.4
HNFSE										139.6	7	432.7	118.6
HNW										138.2	6.9	428.3	117.4
ENT													
GOV													
YTAX													
INDTAX	14.9	59.5	164.4	305.3	0.8	4.3	56.3	316	3.2				
TARRIFS													
ROW							62.4	985.9	211.9				

Appendix 1: Table AI (Continued): Social Accounting Matrix for Ghana 1999 (Billions of Cedis)

	CAP	HAF	HPUSE	HPRSE	HNFSE	HNW	ENT	GOV	YTAX	INDTAX	TARRIFS	ROW	S-I	TOTAL
ACOCOA														504.1
AOAGRG														2017
AMANUF														972
AOINDG														1805
ATRANSG														350.2
AOSERG														1982
CAGRG		435.7	408.4	357.6	380.4	383.5						232.8	-10.9	2640
CINDG		227.9	214	187.4	199.3	200.8						278.6	1531	4079
CSERG		150.6	141.4	123.9	131.7	132.7		732.3				6.6	146.9	2547
LABSM														716.1
LABSF														35.9
LABUM														2220
LABUF														608.8
CAP														826.6
HAF	25.8	-20.8					9.5	10				23.3		829
HPUSE	25.3		-20.5				5	5.5				12.4		777.7
HPRSE	21.3			-18.1			3.5	4				8.9		680.9
HNFSE	23.8				-19		5	5				11.4		724.1
HNW	28.8					-18.7	6.5	7				15.9		730.3
ENT	560	4.5	3.7	3.2	3.5	3.8	523.7	195.5				74.5		1392
GOV							200.2	128.4	479.1	549.2	375.5	190.1		1594
YTAX		33.3	31.3	27.4	29.1	29.4								479.1
INDTAX														549.2
TARRIFS														375.5
ROW	121.5	1	1	0.8	0.9	0.9								1386
S-I		-3.3	-1.8	-1.3	-1.7	-2.3	638.8	506.2				532.1		1667
TOTAL	826.5	828.9	777.5	680.9	724.2	730.1	1392	1594	479.1	549.2	375.5	1386.6	1667	

Appendix 2: Table A2: Values of Elasticity of Substitution and Transformation

SECTOR	CET	CES	FACTORS	LABOUR
Agriculture	1.25	1.5	0.75	1.25
Industry	1.25	0.8	0.75	1.25
Services	1.25	0.8	0.70	