DNA Economics
Making economic sense of common problems

THE MACRO-ECONOMIC IMPACT OF TWO DIFFERENT INDUSTRIAL DEVELOPMENT PATHWAYS IN GHANA

Final report

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1D1F	One District One Factory
ACP	Africa, Caribbean and Pacific
AFOLU	Agriculture, forestry and other land use
AGOA	African Growth and Opportunity Act (AGOA)
BoG	Bank of Ghana
CO_{2e}	carbon dioxide equivalent
CPESD	Coordinated Programme of Economic and Social Development Policies
ECOWAS	Economic Community of West African States
EPA	Ghana Environmental Protection Agency
ERP	Economic Recovery Programme
GCF	Gross capital formation
GDP	Gross domestic product
GFCF	Gross fixed capital formation
GHG	Greenhouse gas emissions
GNI	Gross national income
GPRS	Ghana Poverty Reduction Strategy
GSGDA	Ghana Shared Growth and Development Agency
GVA	Gross value added
IMF	International Monetary Fund
ISI	Import Substitution Industrial
MFI	Micro-finance institutions
NPC	National Population Council
NUP	National Urbanisation Policy
ODA	Official development assistance
RCB	Rural and community banks
S&L	Savings and loans companies
SAM	Social Accounting Matrix
SOE	State-owned enterprises
VAT	Value-added tax

EXECUTIVE SUMMARY

Rapid urbanisation has coincided with stable and rapid growth in Ghana since the start of the millennium. Ghana's experienced an annual average gross domestic product (GDP) growth rate of above 6% between 2005 and 2017, which is well above historical trends and is strong by global standards. While the oil and gas sector has contributed to growth since 2011, urbanisation has played an important role in densely populated urban areas like Accra and Kumasi. Since the early 1990s, labour moved from agriculture to industry and services with very little unemployment, generating increased productivity which contributed towards GDP growth.

Investment in infrastructure, however, did not keep up with the rapid urbanisation. Today Ghana faces several urbanisation-linked challenges that stakeholders believe will threaten its strong growth. These include rapidly growing slums, lowering levels of productivity and deficient infrastructure services that result in congestion, pollution and high operating costs. While Ghana has managed to combine urbanisation and economic growth better than most African countries, it still lags international trends. It has a lower level of development, and a much smaller manufacturing sector, than is expected given its level of urbanisation.

While Ghana's growth performance has improved significantly since 2000, this is in line with that of West Africa and Sub-Saharan Africa more generally. It only outperformed its peers in the year (2011) when its oil reserves started to be fully exploited. International experience has shown that reliance on a new extractive industry makes it more difficult to create productive cities that can drive growth and development. This, coupled with the fact that Ghana is already struggling to deal with accelerating urbanisation, means that now is an important time to focus on creating compacted, connected and clean cities.

Ghana's current industrial policy is focused on transforming the industrial sector through improving the competitiveness of local industries and promoting value addition in specific industries, most notably in agriculture, agro-processing and chemicals and pharmaceuticals. Industrial policy does not have an urban dimension, even though the country faces several challenges linked to urbanisation. In fact, by locating factories in every district in Ghana, decentralisation is a central tenant of the industrial strategy. It does aim to generate some economies of scale by having smaller factories or facilities feed into larger processing hubs. Based on international experience, however, trying to achieve this by establishing several new facilities in different geographic locations will be difficult.

To investigate the potential of a more urban-focused industrial policy with potential climate change co-benefits, an alternative industrial development pathway was developed based on stakeholder input. The impact of this pathway relative to the status quo was investigated using a Social Accounting Matrix (SAM)-based multiplier model. This alternative pathway, labelled the Cities Matter pathway, was built around investments in transport infrastructure, low cost housing, support for informal and small-scale businesses operating in cities, renewable energy, waste recycling, urban agriculture and sustainable and local manufacturing. Stakeholders believed that urbanisation will only become a strong driver for industrial development once the local construction industry starts to use more locally produced inputs. This was reflected in the modelling by including inputs from local

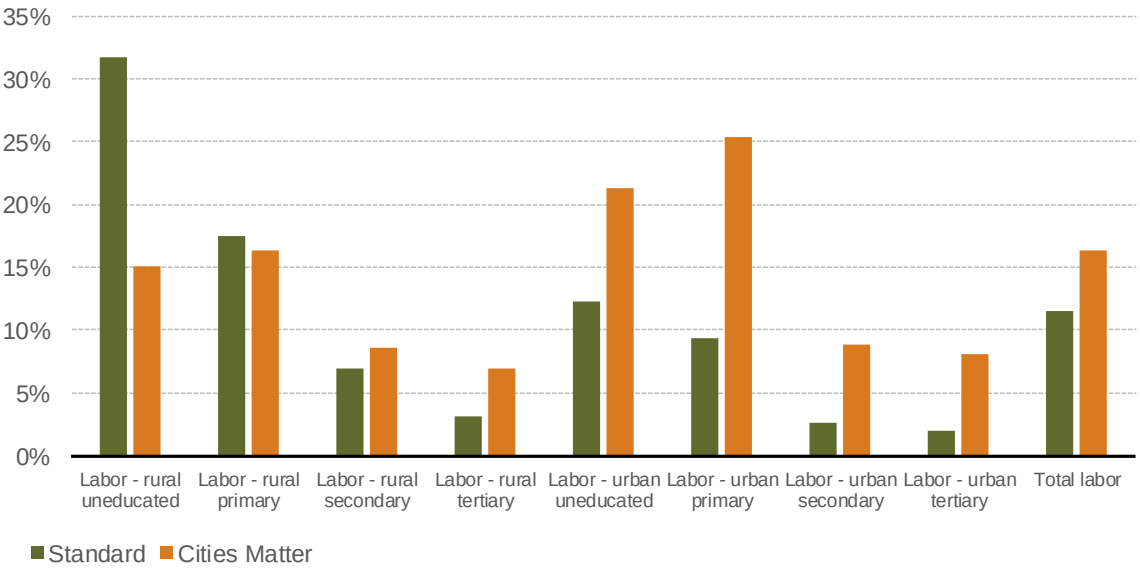
sectors when modelling low-cost housing and transport infrastructure investments. Furthermore, stakeholders emphasised that, given the reality of urban economies in Ghana, it would be very difficult to change the development trajectories of cities without increasing the efficiency of small-scale and informal businesses. Consequently, small-scale and informal sector support (including commercial zones) received the largest proportion of investment (20%) under the Cities Matter pathway.

Figure 1: Modelled economic growth outcomes

Source: Own calculations based on (GSS, ISSER and IFPRI, 2017).
Source data available at http://www2.statsghana.gov.gh/nada/index.php/catalog/95

In terms of growth in output, gross value added and gross domestic product, the modelling results showed that the Cities Matter pathway had the potential of significantly increasing growth. Output, for example, increased by more than 50% from an already impressive 12% under the Standard Industrial Policy pathway to 18.3% under the Cities Matter pathway.

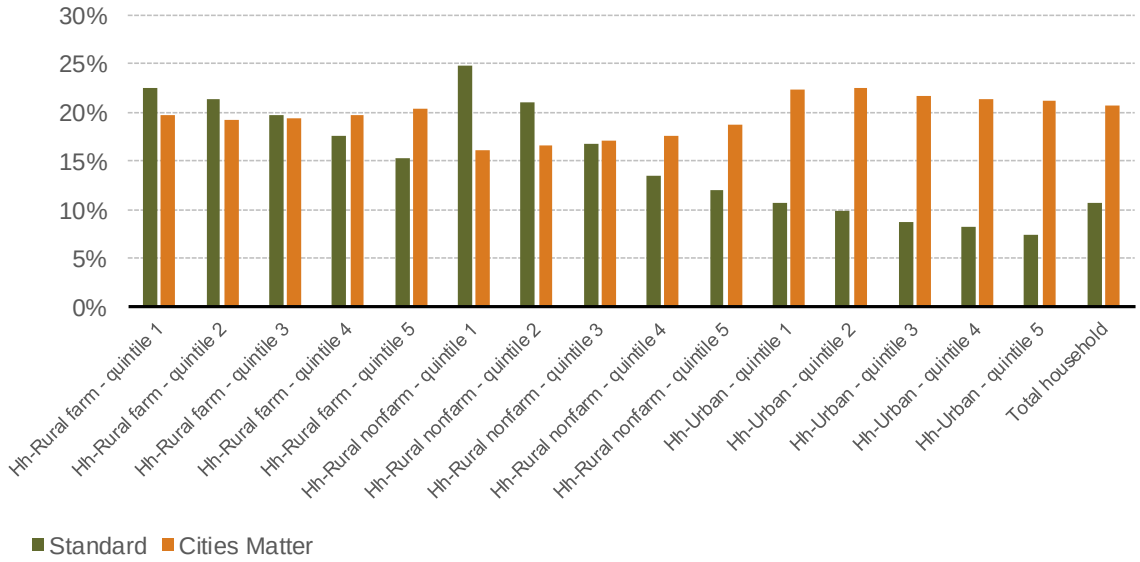
Figure 2: Percentage change in labour income for Standard and Cities Matter pathways (nominal)



Source: Own calculations based on (GSS, ISSER and IFPRI, 2017).
Source data available at http://www2.statsghana.gov.gh/nada/index.php/catalog/95.

Labour income and total household income also increases faster under the Cities Matter pathway.

Figure 3: Percentage change in household income for Standard and Cities Matter pathways (nominal)



Source: Own calculations based on (GSS, ISSER and IFPRI, 2017).
Source data available at http://www2.statsghana.gov.gh/nada/index.php/catalog/95

Figure 4: Percentage change in output for Standard and Cities Matter pathways (nominal)

Commodity sector	Standard Industrial Policy pathway		Cities Matter pathway	
	% Change	% Contribution to output	% Change	% Contribution to output
Cereals	101%	16%	1%	0%
Fruit and vegetables	0%	0%	46%	8%
Other crops	16%	4%	3%	0%
Livestock and livestock products	126%	14%	2%	0%
Forestry and fishing	12%	2%	10%	1%
Mining	1%	1%	2%	2%
Food, beverages and tobacco	140%	45%	1%	0%
Textiles, clothing and leather	16%	1%	3%	0%
Wood and paper	13%	2%	3%	0%
Petroleum	4%	1%	6%	1%
Chemicals	18%	2%	7%	0%
Minerals and metals	3%	0%	29%	2%
Equipment and machinery	320%	1%	5%	0%
Other manufacturing	529%	6%	883%	7%
Electricity, gas, steam	4%	1%	9%	2%
Water supply and sewage	1%	0%	5%	0%
Construction	1%	0%	62%	38%
Trade	0%	0%	57%	25%
Transport and storage	0%	0%	2%	1%
Accommodation	0%	0%	0%	0%
ICT	0%	0%	4%	1%
Finance	0%	0%	12%	2%
Real estate	0%	0%	13%	2%
Business services	0%	0%	16%	4%
Public administration	0%	0%	0%	0%
Education, health and other	3%	2%	0%	0%
Renewable energy*	4%	0%	422%	1%
Waste to energy*	0%	0%	4218%	1%
Sustainable manufacturing*	0%	0%	47248%	2%
	12%	**100%**	**18%**	**100%**

Source: Own calculations based on (GSS, ISSER and IFPRI, 2017).
Source data available at http://www2.statsghana.gov.gh/nada/index.php/catalog/95
** Because these sectors were added to the SAM, and the share of their output was "fixed" to amount for a small percentage of total output to not distort linkages between the existing sectors in the SAM, even small investments in these sectors will have a large impact on the increase in output from these sector because growth is of an artificially low base.*

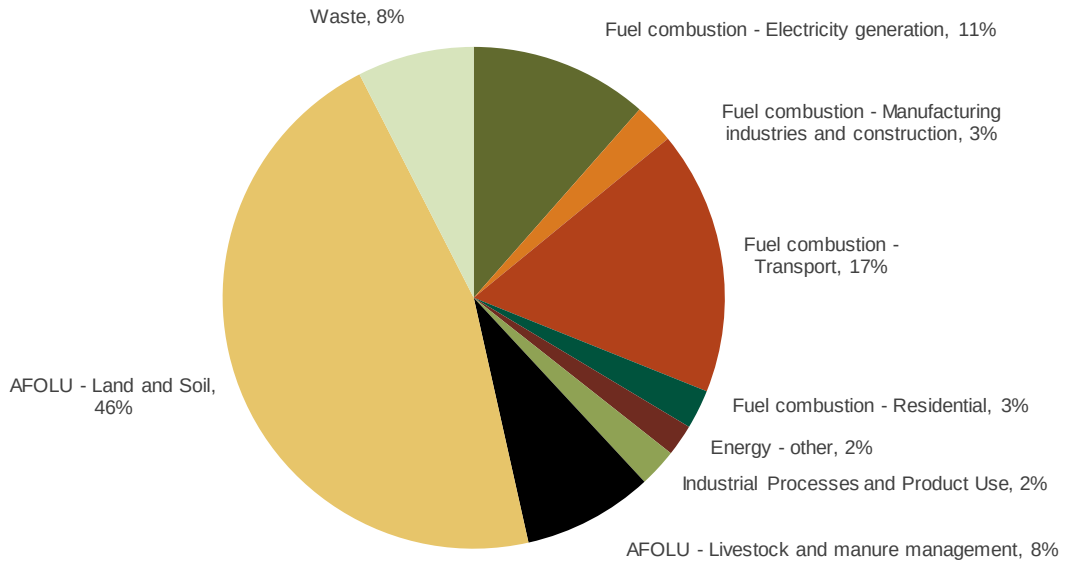
Under the Standard Industrial Policy pathway, growth is driven primarily by the agriculture sector and agro-processing, while the construction and trade sectors account for almost two thirds of growth under the Cities Matter pathway.

The Cities Matter pathway leads to a slightly higher current account deficit, but this is marginal (12% vs 11%). And the current account deficit in both pathways are close to the baseline value of 10%.

The current account is likely to be less of an issue than shown in the results because Ghana's trade balance has improved since the SAM base year of 2015.

The sectoral composition of growth under the Cities Matter pathway is also better aligned to the current structure of Ghana's economy, in that the largest local sectors in the three regions with the largest local economies, Ashanti, Greater Accra and Western (which houses the cities of Accra, Kumasi and Secondi-Tokaradi), grow faster under the Cities Matter pathway than the Standard Industrial Policy pathway.

Figure 5: Sources of GHG Emissions in Ghana (2016)



Source: Calculations based on Ghana's Fourth National Greenhouse Gas Inventory Report (EPA, 2019)

The agriculture, forestry and other land use (AFOLU) sector contributes more than half of Ghana's national emissions, while emissions linked to industrial activity are relatively small. It is therefore unsurprising that the Cities Matter pathway leads to a much smaller increase in GHG emissions than the Standard Industrial Policy pathway. Assuming urban farming won't lead to deforestation or additional land-based emissions, the Standard Industrial Policy pathway leads to an increase in Ghana's national emissions of 50%, whereas the Cities Matter pathway is estimated to only lead to a 4% increase in emissions.[1]

Interestingly, the discovery of oil in Ghana has not significantly changed the country's GHG emissions trajectory. Towards the late 1990s there was a rapid shift from biomass fuel to crude oil as a primary fuel in Ghanaian in response to a government policy to diversify away from a reliance on biomass in the energy sector (EPA, 2019). Almost all the crude oil extracted in Ghana is exported, while natural has been displacing crude oil. Initially the gas originated from the West Africa Gas Pipeline, but from 2014 local supplies were also utilised. Electricity generation is the 2nd largest contributor to GHG emissions within the energy sector (contributing 4.84 $MtCO_{2e}$ out of an energy sector total of 5.21 $MtCO_{2e}$ in 2016). Even though energy sector emissions, and emission from the energy industries (which is dominated by electricity generation) in particular, have been growing in importance, they are still smaller than Agriculture, Forestry, and Other Land Use (AFOLU) in Ghana. And within the energy sector, transport emissions were almost 40% larger than energy industries emissions in 2016. Transport emissions have, however, been increasing at a slower rate than emissions from energy industries.

The high level of emissions in the transport sector illustrates the fact that GHG emissions related to the oil and gas industry are concentrated in the consumption of these products, and not their extraction. While transport emissions stood at 7.17 $MtCO_{2e}$ in 2016, emissions linked to the exploitation of oil and gas reserves were only 0.05 $MtCO_{2e}$. Emissions from oil refining were five times larger at 0.25 $MtCO_{2e}$ but Ghana's only oil refinery predates the discovery of local oil reserves and these emissions cannot therefore be linked to the local oil industry. Arguably the main impact on Ghana's GHG emissions pathway of the local discovery of oil been the increased utilisation of natural gas in electricity generation but given the existence of the West African Gas Pipeline even this link is debateable.

The results above suggest that an urban-focused industrial policy could accelerate economic growth in Ghana while decreasing the carbon-intensity of the Ghanaian economy. Furthermore, the rising urban population is expected to stimulate demand for goods and basic services including social amenities and infrastructure. A development strategy built around turning cities into drivers of growth is therefore relatively low risk since demand for these goods and services are likely to remain strong in future. Focusing on urban demand could therefore be a dependable strategy to support long-term economic growth.

[1] If this assumption is removed, total emissions under the Cities Matter pathway increases by 10%.

1 INTRODUCTION

The Ghana Urbanisation Think Thank was formed by the Ministry of Local Government and Rural Development and organized in collaboration with the Urban Management Institute, the Coalition of Urban Transitions (the Coalition), and the African Centre for Cities (ACC). The Think Tank was convened to support the Government of Ghana to engage with urban development as a socioeconomic learning opportunity. It aims to draw on local and international knowledge and experience to inform policies that will enable Ghana to use the current rapid urbanisation as a driver of sustainable development. While economic growth rates and increasing urbanisation in Ghana is correlated to a larger extent than in most African countries, it is likely income growth drove urbanisation rather than urbanisation acting as a growth driver. Ghana has been grown in spite of urbanisation, rather than because of it. In fact, the negative externalities linked to unmanaged urbanisation like growth in slums and congestion, pollution and high operating costs linked to inadequate infrastructure provision is now starting to threaten Ghana's strong recent growth performance.

Cities have historically played an important role in driving the industrialisation and development of countries. In Africa, however, this has largely not been the case. If cities in Africa can be made more efficient and productive, this could have a significant impact on the development trajectory of countries like Ghana. This report provides the Think Tank with policy-relevant research considering how urbanisation could be used to shape more sustainable industrial development in Ghanaian. This can inform the current review of Ghana's National Urbanisation Policy (NUP). It explores the macroeconomic impacts of two different industrial development pathways in Ghana. The Standard Industrial Pathway is based on the Government of Ghana's current industrial policy stance and is indicative of activities normally associated with state-led industrial policy activities. The Cities Matter pathway, in contrast, includes interventions aimed at creating more compacted, connected and cleaner cities. The compact nature of cities, and their connections to other cities in the area, region and globally, will increase efficiency and productivity; as will improved health outcomes for residents. The pathways are indicative of different approaches to industrial development and should not be viewed as competing policy choices. Depending on the extent that trade-offs exist, they could even be complementary.

The report investigates whether investments aimed at increasing creating more compacted, connected and cleaner cities can accelerate short-term development in Ghana. There are long-term benefits associated with creating compacted, connected and clean cities that makes this a sensible investment if there is no short-term growth impact, but then political economy considerations become more important – and the messaging of the policy becomes critical.

The report starts by providing a discussion of recent literature on urbanisation and industrialisation, and then proceeds to consider Ghana's urbanisation experience and its historical development context. This includes the development landscape in three focus regions. The sections that follow describe the methodology to model the different pathways, outlines the alternative industrial pathways, and presents the results from the modelling. A short conclusion follows. Additional information is provided in appendices.

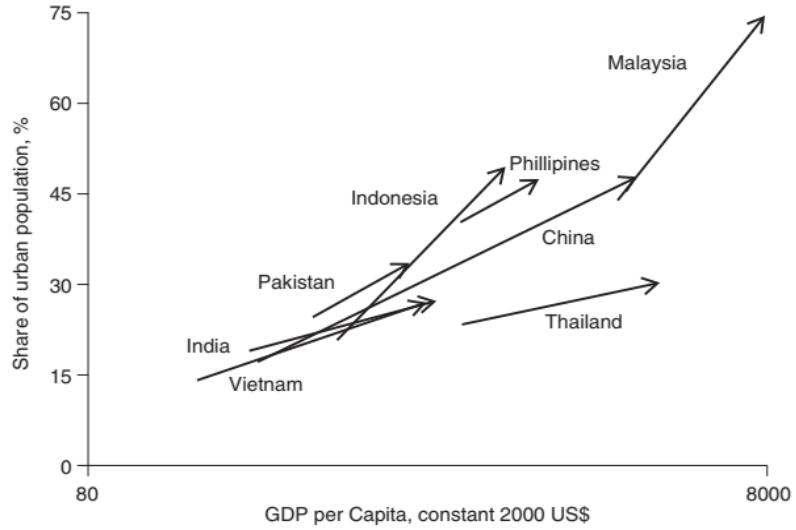
2 URBANISATION, INDUSTRIALISATION AND DEVELOPMENT

Structural change within an economy can be growth-enhancing or growth-reducing. Growth-enhancing change refers to the movement of labour and resources from low productivity to higher productivity sectors, while growth-reduced refers to the opposite (McMillan & Rodrik, 2011). As such, growth-enhancing structural change can contribute to economic growth when sectors that produce goods and services more efficiently develop and grow. And when these sectors also produce more sophisticated goods and services, they often also stimulate growth in sectors that supply them with inputs. Manufacturing and tradeable services, in particular, are viewed as potentially high productivity sectors that can support economic diversification, reduce poverty and create employment (Page, 2016). As a practical example in the services sector, the growth of transport and logistics, design, engineering and R&D services traditionally complement the growth of the manufacturing sector in a way that growth in household services, cleaning and security (with their more limited forward and backward economic linkages) do not. To expand this example, a more vibrant transport and logistics industry can lower transaction costs and lead times, while a stronger design, engineering and R&D industry will stimulate innovation and improve products and processes. Overall, this improves a country's manufacturing competitiveness and leads to a more diversified industrial base (Wuyts & Kilama, 2014).

Historically, economic development and urbanisation happened together and was accompanied by industrialisation. There was a very close relationship between urbanisation rates and income per capita in both developed and developing countries (Chen, et al., 2014; Gollin, et al., 2016). Based on the strength of this association, and research mostly dealing with developed countries and rapidly developing Asian countries, the development community started advocating for urbanisation as a driver of economic growth – emphasising the importance of cities in acting as "engines of growth" (Turok & McGranahan, 2013). Urbanisation, thus, was believed to foster growth-enhancing structural change. World Bank (2015), for example, summarises the link as a positive and significant relationship between urbanisation and economic, where urbanisation can facilitate economic growth, social transformation, improve livelihoods and boost rural development, if well executed.

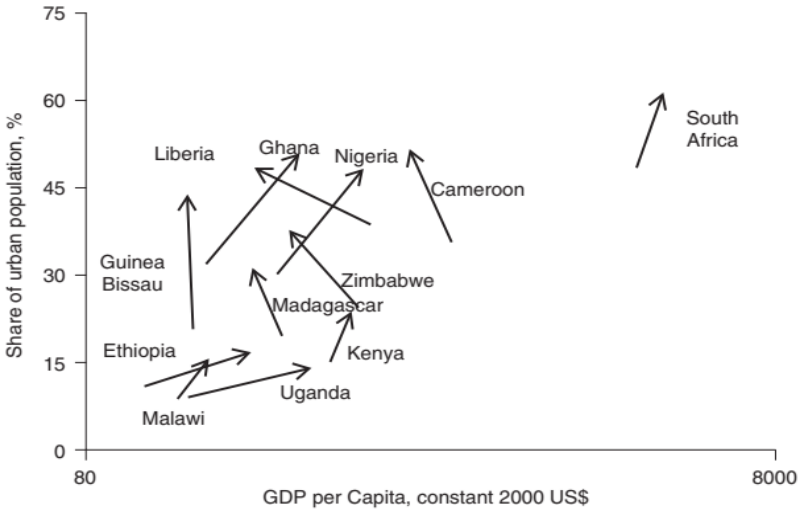
Recently literature, however, has casted doubt on the assumption of a relatively linear relationship between urbanisation and economic development. In many developing countries, and particularly in Africa, the link between urbanisation and development is much more tenuous than for developed or rapidly developing Asian countries (Turok & McGranahan, 2013).

Figure 6: Relationship between urbanisation and income (East Asia and the Pacific)



Source: (Turok, 2012)

Figure 7: Relationship between urbanisation and income (Sub-Saharan Africa)



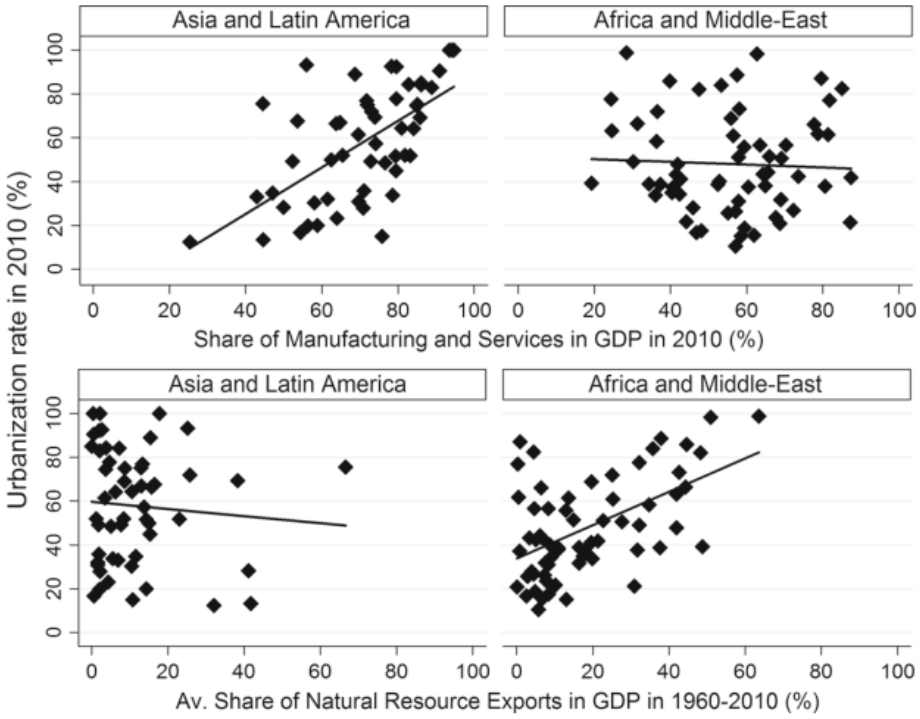
Source: (Turok, 2012)

Figure 6 and Figure 7 show that while there was a significant increase in both urbanisation and GDP per capita between 1985 and 2010 in a selection of countries in East Asia and the Pacific, the relationship between the two variables looked very different for a selection of Sub-Saharan African countries. Not only did five countries experience a fall in income levels over the same period while their urbanisation level increased (compared to none in the first graph), but the average increase in income for the remaining seven countries (as evident by the horizontal length of the arrows) was much smaller in relation to the increase in urbanisation levels than was observed for the selection of countries in East Asia and the Pacific. Furthermore, while Chen et al (2014) found a clear link between the level of urbanisation and economic development in a sample of 266 countries and regions, the authors did not find that faster urbanisation led to more rapid economic growth.

Gollin et al (2016) document the phenomenon of urbanisation without industrialisation and emphasise that this is particularly prevalent in Africa and the Middle East. The extent of

industrialisation is measured as the percentage contribution of manufacturing and services to GDP. The authors find that lower levels of industrialisation than expected given the level of urbanisation is strongly correlated with countries being resource exporters.[2] This is shown in Figure 8.

Figure 8: Urbanisation and industrialisation in Africa and Middle East relative to Asia and Latin America



Source: (Gollin, et al., 2016)

Urbanisation is consistently driven by income per capita, and the factors that drive income per capita has important implications for future economic growth and industrialisation (Gollin, et al., 2016). Where higher income (and urbanisation) is driven by resource exports, it leads to the creation of what the authors call "consumption cities". In these cities urban employment is largely made up of informal manufacturing and non-tradable services like transportation, commerce or personal and government services. Cities in countries that do not have significant resource exports, in contrast, are largely "production cities" where the bulk of urban employment is in industrial sectors like formal manufacturing and tradable services like finance, insurance, real estate and business services. Consumption cities have higher levels of imports than production cities, higher poverty rates and larger shares of the population living in slums. Thus, while consumption cities are richer than they would have been in the absence of resource exports (and indeed this is the reason why they have higher urbanisation rates), the authors believe "this does not appear to translate into improved quality of life to the same degree that an income boost through industrialization [in production cities] would provide" (Gollin, et al., 2016, p. 37).

[2] The quantitative analysis in Gollin et al (2016) support the assertion by Turok (2012) that the presence of resource rents may be creating incentives that are distorting markets in African cities in a fashion similar to that attributed to the 'resource curse' at the national scale.

Henderson and Kriticos (2018), however, find that the importance of natural exports in the creation of cities in Sub-Saharan Africa is significantly less than in Asia, North Africa and the Middle East. They do, however, also find that higher incomes lead to the development of cities, and a difference in the composition of employment within cities between the regions. In Sub-Sahara Africa, a much larger proportion of the population in cities (including the largest cities) is involved in agriculture than is typical elsewhere. So Gollin et al (2016)'s argument that there is a difference in the nature of cities linked to why they were formed still holds. But rather than a distinction between resource-exporters and non-resource exporters, it may be that higher per capita incomes linked to endogenous factors (like the development of competitive local manufacturing) lead to the development of production cities, whereas exogenous increases in per capital income (whether derived from natural resource industries or other factors like international aid or even domestic fiscal transfers and incentives) lead to the development of consumption cities.[3]

These findings are supportive of Turok and McGranahan (2013, p. 446)'s view that "urbanization is often conflated with agglomeration", and that these concepts are not synonymous. The authors point out that agglomeration economies[4] refer to the benefits that firms realise from being near firms in the same (localization economies) and/or other (urbanization economies) sectors. As discussed in the next paragraph, however, agglomeration economies will only stimulate development if cities are planned and managed well. If this is not the case, negative externalities linked to congestion will erode the benefits of agglomeration economies and may cause them to disappear altogether if it simply becomes too time-consuming or expensive for economic actors to interact. Agglomeration economies stem from three main sources (Duranton, 2013; Duranton & Puga, 2003; Turok & McGranahan, 2013; Quigly, 2009):

- Cities facilitate the **sharing** of**,** and low-cost access to, a range of infrastructure, public goods, production facilities and service providers. The benefits range from a larger range of intermediary inputs, better transport and telecommunications links, to specialised services in areas like research, finance, law and other business services. Importantly, they also facilitate the creation of larger markets and associated risk-sharing benefits.
- The close proximity of skills and firms in cities improves **matching** outcomes. Firms more easily find the type of skills they need, whereas employees find employers whose needs match their skills and experience. These benefits also extend to the relationships between the buyers and sellers of intermediary goods and services, and the supply (investors and financiers) and demand (inventors, entrepreneurs, enterprises looking to expand, etc) of capital. Matching also reduces transaction costs by concentrating skills, production and capital in fewer economic entities that compete with each other for resources.
- Concentrating skills, knowledge, education and entities producing a variety of goods and services in cities supports **learning and innovation**. This leads to knowledge being created,

[3] Henderson and Kriticos (2018) posit that biases in capital markets, fiscal incentives to firms or even government employment may be some of the reasons that the largest cities in Sub-Saharan Africa is growing faster than smaller cities in the same countries.

[4] Also referred to as external economies to distinguish them from internal economies, which are the economies of scale that originate within firms as they increase in size (Turok & McGranahan, 2013).

shared and accessed more quickly. In addition to once-off benefits like better goods and services and lower transaction and production costs, learning and innovation effects can become stronger over time as people, firms and funders not only learn from each other, but also learn how to collaborate and even compete more effectively.

As alluded to earlier, Turok and McGranahan (2013) emphasise that the presence of agglomeration economies does not always support economic growth. Cities also generate negative externalities, and these become more significant as they grow. If cities are not planned and managed properly, and markets within them do not function well, congestion and overcrowding, infrastructure bottlenecks, higher cost of living, increasing property and labour costs, and pressure on ecosystems services like water and air quality, can offset the benefits of agglomeration (Turok & McGranahan, 2013; Duranton, 2009). Turok and McGranahan (2013, p. 466) emphasises that the type of urbanisation matters, and that it is not urbanisation in and of itself that creates and sustains economic growth, but "rather the *form that urbanization takes* and *whether it provides an efficient enabling environment* [emphasis added]".

In Ghana, as in most of Africa, however, cities have not created an environment conducive to the development of productive manufacturing enterprises that can boost economic growth as rural workers swop "field for factory" (see Section 4) (The Economist, 2018). One of the reasons for this may be that largest (primate) cities in developing countries, an in Africa in particular, often grow larger than their optimal size (Duranton, 2009; Duranton, 2013; Henderson & Kriticos, 2018). In most developing countries economic activity is concentrated in the largest cities to a much larger extent than is the case in developed countries, and consequently the negative externalities referred to above is likely to negate much, if not most, of the benefits of agglomeration. Ideally, activities like the manufacturing of intermediary inputs and support services (like call centres) should migrate to secondary cities. This will reduce congestion and other negative impacts in the largest (primate) cities, allowing these cities to be more vibrant, innovative and efficient places focusing on incubating or adopting new products, services and technologies. For this to work, however, labour, goods and services markets should work relatively well, and good transport and telecommunication links should exist between primate and secondary cities (Duranton (2009; 2013).

There is a broad literature supporting the existence of agglomeration benefits, although there is some disagreement about the size of these impacts (Duranton & Puga, 2003; Duranton, 2013; Quigly, 2009; Turok & McGranahan, 2013; Henderson & Kriticos, 2018). Furthermore, Gollin et al (2016) mention that it is possible for consumption cities to evolve into production cities over time if the right conditions are created. Unfortunately, what drives agglomeration economies is not well understood, and this is particularly true in Africa due to limited local research (Duranton, 2013; Turok & McGranahan, 2013). In fact, Duranton (2013) emphasises that given this uncertainty, the complex environment in developing countries, and the experience in developed countries, policies aimed at fostering agglomeration benefits directly are unlikely to succeed. At present, thus, rather than following location-based strategies to target growth in cities directly**, the focus should be on investments in areas like infrastructure; education, health and other public services; governance structures and well-functioning markets to create conditions that are conducive to growth** (Gollin, 2018; Duranton, 2013; Henderson & Kriticos, 2018).

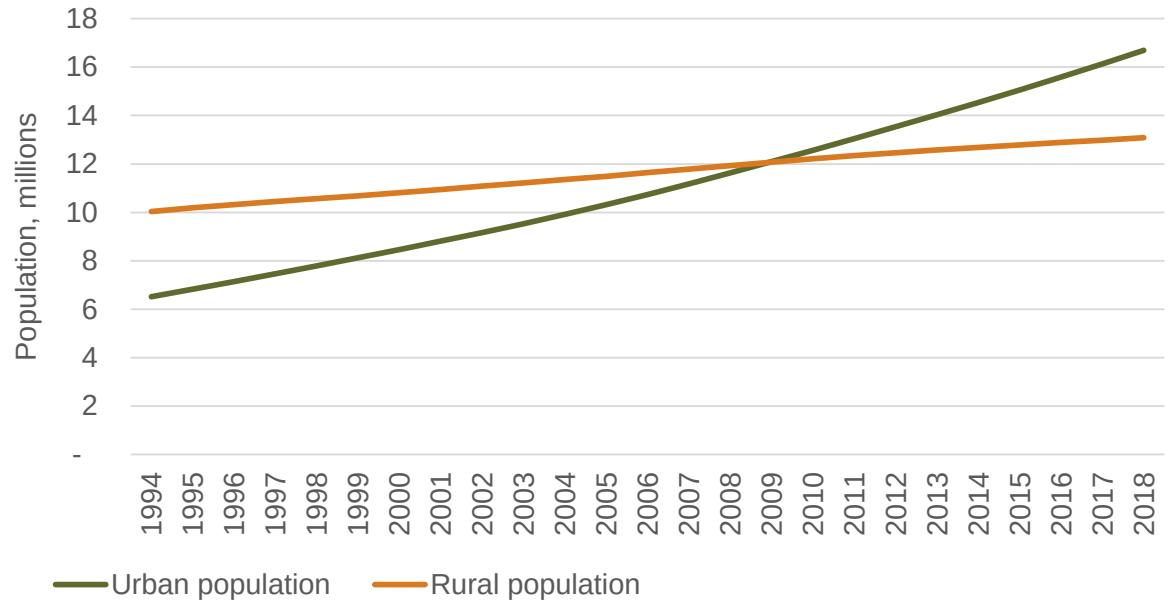
3 GHANA'S URBANISATION EXPERIENCE

In Ghana rapid urbanisation has coincided with stable and rapid growth since the start of the millennium. Ghana's growth performance in recent decades, posting an annual average gross domestic product (GDP) of above 6% between 2005 and 2017, is well above historical trends and is strong by global standards (Danquah, M., & Iddrisu, A.M., 2016). One of the major economic drivers has been the discovery of oil and gas in the last quarter of 2010, and its contribution towards Ghana's economic activities since 2011. Ghana discovered Oil in commercial quantities in 2007 but began commercial exploration in 2010. Ghana has also achieved significant success in various facets of human development. The national headcount poverty incidence decreased from 51.2% in 1991/92 to reach 23.4% by 2016/17 (Ghana Statistical Service, 2018).

The Word Bank (2015) believes urbanisation in Ghana has generated agglomeration effects and economies of scale that increased productivity in densely populated urban areas like Accra and Kumasi. Urbanisation, for example, enabled secondary schooling at scale which improved the stock of human capital in these areas. Furthermore, the number of households that have access to electricity and other amenities increased in Accra, thereby improving the quality of life in this region.

During Ghana's urbanisation, especially between 1992-2010, the movement of people to cities occurred without creating excess labour supply. Rather, a structural transformation occurred as labour moved from agriculture to industry and services with very little unemployment, which contributed towards Ghana's GDP growth over this period. As more people and businesses moved to the cities, economies of scale and agglomeration effects were enhanced – boosting economic growth (World Bank, 2015).

Figure 9: Ghana's urban and rural population

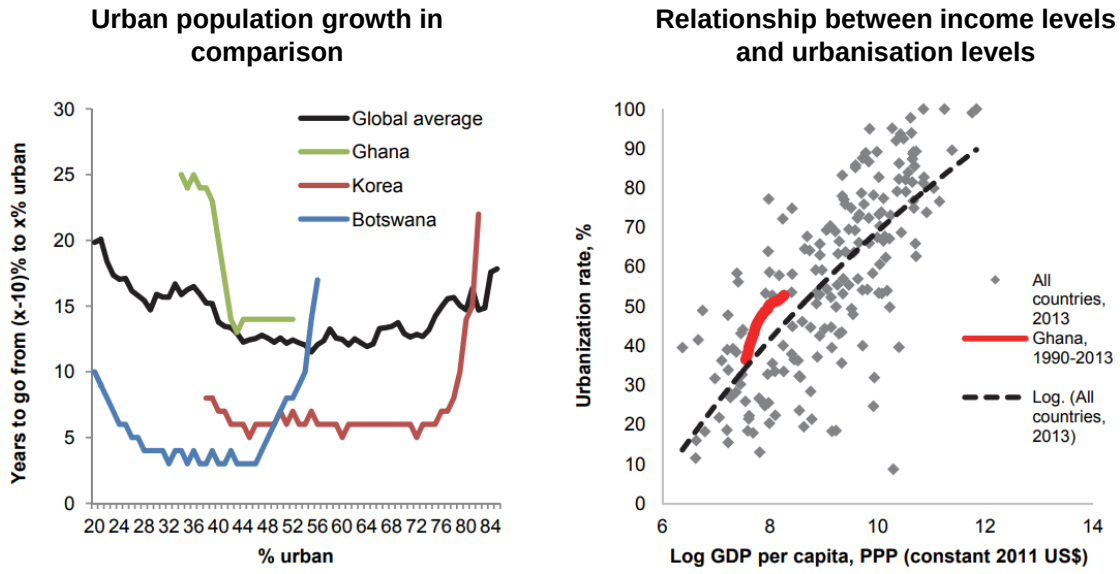


Source: (World Bank, 2019)

While Ghana's growth and poverty alleviation performance has been strong, investments in infrastructure have not kept up with the rapid urbanisation shown in Figure 9. The country faces several challenges linked to urbanisation that stakeholders believe are starting to threaten its rapid growth. These include rapidly growing slums, lowering levels of productivity and deficient infrastructure services that result in congestion, pollution and high operating costs (World Bank, 2015).[5] The World Bank (2015) shows that access to piped water, waste disposal, and toilet facilities all decrease as distances from city centres increase in Accra and Kumasi. The authors believe this. reflects rapid population growth in peri-urban areas having outpaced the capacity of government to supply basic infrastructure.

Even though the graphs in the previous section show that Ghana has managed to jointly grow and urbanise more successfully than most African countries, the analysis in World Bank (2015) shows urbanisation still hasn't driven development in Ghana to the extent expected based on international experience. Figure 10 shows that while Ghana has urbanised slower than expected given its starting position (i.e. it took longer to achieve 10% increments in its urbanisation level than is normal internationally), it has urbanised faster since 1990 than would be expected given its level of GDP per capita. Or conversely, in 2013 Ghana had a lower level of development than would be expected given its level of urbanisation.

Figure 10: Ghana's urban relative urbanisation performance



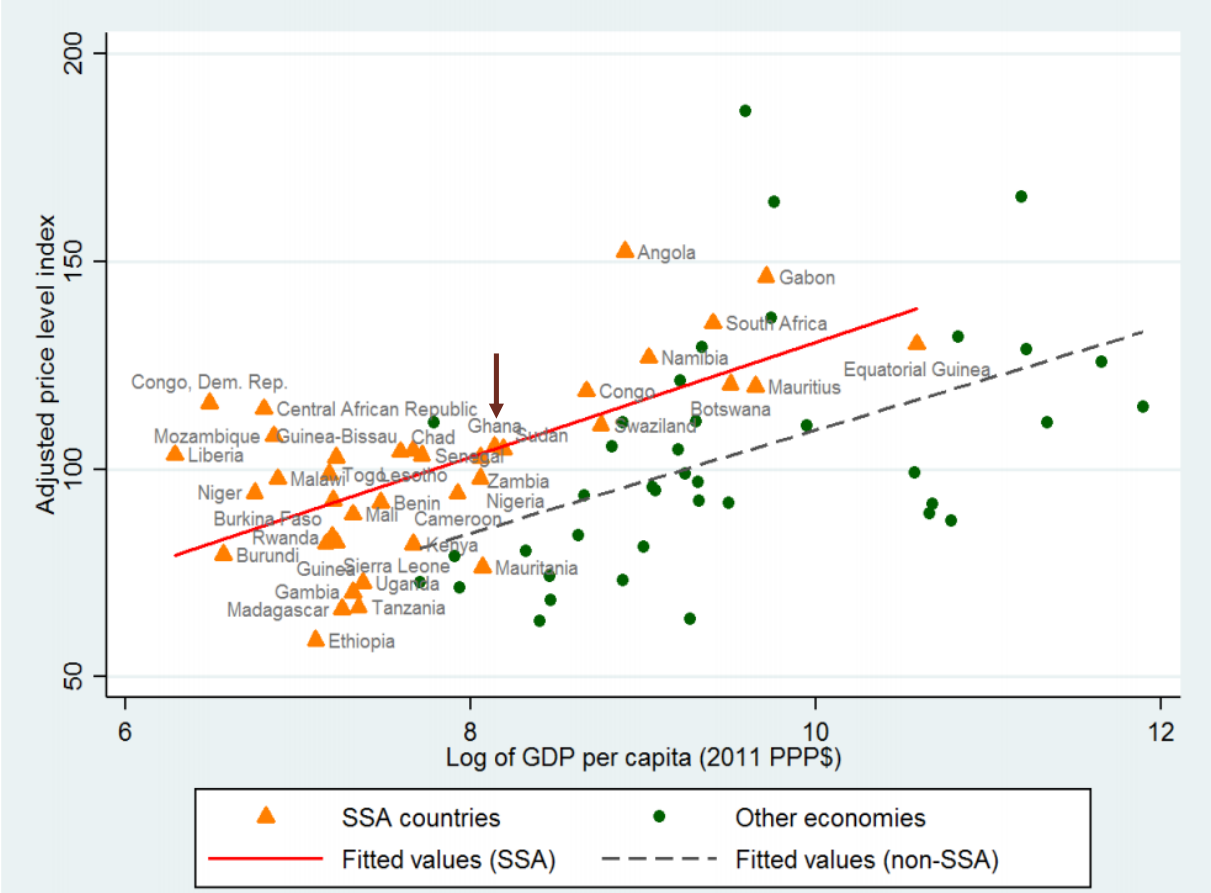
Source: (World Bank, 2015)

Nakamura et al (2016) find that urban living costs in Ghana is consistent with its level of development within Sub-Saharan Africa. But urban living costs are significantly higher within Sub-Saharan Africa

[5] Ghana has however managed to reduce the number of urban dwellers living in slum conditions in Accra from 53% in 1968 to 37.9% in 2014. The percentage of urban population living in slums in Ghana is also still relatively low by Sub-Saharan African standards (Lall, et al., 2017).

than it is than for countries with a similar level of development outside of Sub-Saharan Africa. This is shown in Figure 11 below.

Figure 11: Urban living costs relative to level of development in Sub-Saharan Africa and elsewhere



Source: (Nakamura, et al., 2016)

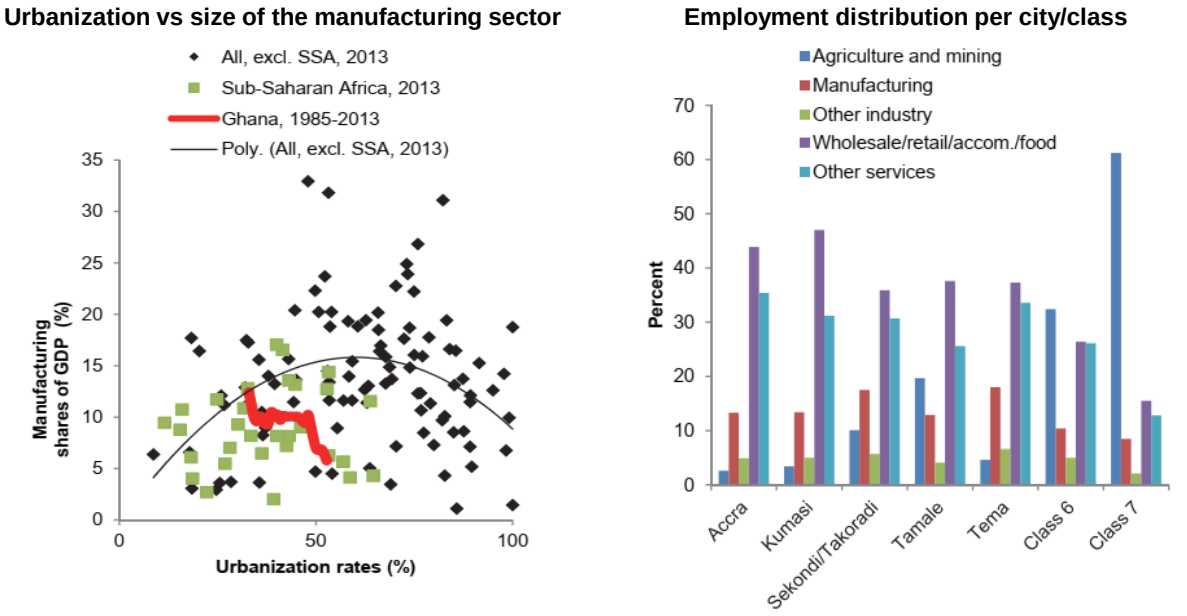
Ghana's development approach (as outlined in Appendix 1) is centred around a desire to create a structural transformation of the Ghanaian economy that ensures shared prosperity and inclusive growth driven by the development of a vibrant industrial landscape. Over the years, several industrial development strategies have been pursued with the ultimate goal of promoting industrialisation alongside sustainable and equitable growth. Figure 12 below shows that urbanisation has not coincided with a growth in the manufacturing sector in Ghana. The contribution of the manufacturing sector to GDP in Ghana is much lower than would be expected given its level of urbanisation.[6] And employment in urban areas is heavily skewed towards services (also see Figure 32 in Section 5). And given that Ghana's exports are largely primary products with relatively basic service input requirements relatively basic services, and Ghana has a large services trade deficit, local urban

[6] Figure 16 in Section 4.1 shows that the contribution of the manufacturing sector to GDP has been increasing since 2013, but it is still low relative to the level of urbanisation based on the information in Figure 12. The boost in manufacturing and other industry is also more likely to be driven by the oil sector than agglomeration benefits linked to urbanisation.

employment is therefore expected to be mostly in untraded services (see Section 4.3).[7] This is confirmed by the types of services generating the most revenue in the three most industrialised regions in Ghana (see Section 5).

The limited structural transformation is one of the explanatory factors for the low levels of socio-economic development. The manufacturing sector is an important engine for economic growth, and yet for Ghana this remains underdeveloped. While the agricultural economy contribution to GDP has declined over time (Figure 12), the shift has been towards the services sector and not manufacturing (or industry). Moreover, within the services sector there has been an increase in typically less-productive informal services such as wholesale and retail (Ghana Statistical Service, 2014; World Bank, 2015). Krakah & Bessah (2016) shows that in almost all districts in Ghana, establishments in the services sector dominate other sectors in terms of contribution to employment. This is conducive with the 'consumption cities' narrative outlined in the previous section.

Figure 12: Urbanisation and employment distribution



Source: (World Bank, 2015)

As mentioned in Section 2, one explanation for cities in Africa not creating an environment conducive to development of productive manufacturing sector is the largest (primate) cities in developing countries having grown larger than the optimal size relative to other cities. The negative externalities (e.g. congestion and high rents) that accompany this would make it difficult for cities to become productive cities over time.

In terms of population, the two largest urban areas in Ghana are very similar. The Accra metropolis is home to 34% of the urban population in Ghana, and the Kumasi Metropolis 33% (see Section 5).

[7] As emphasised in Section 2, the problem with untraded services is not that they aren't traded *per se*, but rather than they focus on restrictive local markets. The lack of economies of scale restricts wages, investment and productivity.

If other urban areas in the districts are included, the Greater Accra region accounts for 39% of the urban population, the Ashanti region 35% and the Western region 10%. And the number of business establishments is even less concentrated, with Greater Accra accounting for 28% of the business establishments in Ghana, Ashanti 19% and the Western region 10%. When the scale of economic activity is considered, however, the picture looks completely different. In terms of revenue generated by business establishments, Greater Accra is responsible for 68% of the total and Ashanti and the Western region on 11% and 8% respectively. The Eastern region, the fourth largest region, only accounts for 3% of the revenue generated by business establishments in Ghana.

Despite its dominant role in driving economic activity, Greater Accra has an unemployment level almost double the national average (see Section 5). This is linked to the fact that migrants believe, and rightly so based on the content of the earlier paragraph, that Accra offers better economic opportunities than other urban centres (Crentsil & Owusu, 2018). In reality, however, the formal sector has not been able to meet expectations in terms of employment or social services, and the informal sector is main provider of employment, housing and socioeconomic opportunities in Accra (Crentsil & Owusu, 2018). Greater Accra also has by far the worst traffic congestion of all the regions in Ghana. Almost 31% of households in the region listed 'traffic jam' as their main transport problem in 2012 compared to almost 18% in the Western region (the second most congested region) and a national average of 12.5% (Ministry of Roads and Highways, Ministry of Transport and Ghana Statistical Service, 2012). A significant proportion of the residents (27.3%) also listed heavy traffic as their main difficult in getting to work in the Greater Accra region, compared to less than 14% in the Ashanti region (the second worst performer according to this metric) and a national average of 8%. An argument can thus me made that Accra has grown to a size where diseconomies of scale are being experienced.

Finally, while Ghana's growth performance has improved significantly since 2000, its growth is in line with that of the West Africa and Sub-Saharan Africa more generally (see Figure 13 in Section 4.1). The only year where it clearly outperformed its peers was in 2011 when its oil reserves started to be fully exploited. And based on the experience internationally, reliance on a new extractive industry makes it more difficult to create productive rather than consumption cities. This, coupled with the fact that Ghana is already struggling to deal with accelerating urbanisation, means that now is an important time to focus on creating compacted, connected and clean cities. Research by the Coalition for Urban Transitions (2019, p. 1) emphasises that this could have significant social and economic benefits. In addition to creating the conditions to move to zero-carbon cities to tackle the climate crisis, it also provides a "a powerful lever to secure economic prosperity and boost living standards across a country".

The previous section highlighted that this is not an easy thing to do. Cities in Ghana largely developed in an unstructured manner without unclear rules and regulations on property rights, patchy enforcement of local regulations, and a lack of institutional frameworks to plan and address urban market failures. Addressing these issues will require several interventions coupled with coordinated efforts from various government departments. Investing in urban and inter-urban infrastructure by itself is unlikely to change the nature of urbanisation, but as discussed in Section 2, it could help to address the negative externalities (congestion and overcrowding, infrastructure bottlenecks, higher

cost of living, increasing property and labour costs, and pressure on ecosystems services like water and air quality) that occur when cities are not planned and managed properly. It could thus create the necessary foundations for other policies and interventions to build on to develop productive cities. Furthermore, these interventions are unlikely to be successful without significant changes to the regulatory environment to support orderly urbanisation. Linking Accra (Ghana's primate city) to secondary cities could have a large significant impact given that, like most cities in Africa, it seems to have grown larger than its optimal size, and negative externalities may be reducing agglomeration benefits (see Sections 2 and 5). Creation conducive conditions to migrate activities like the manufacturing of intermediary inputs and support services (like call centres) to secondary cities could thus help to create a more vibrant urban environment.

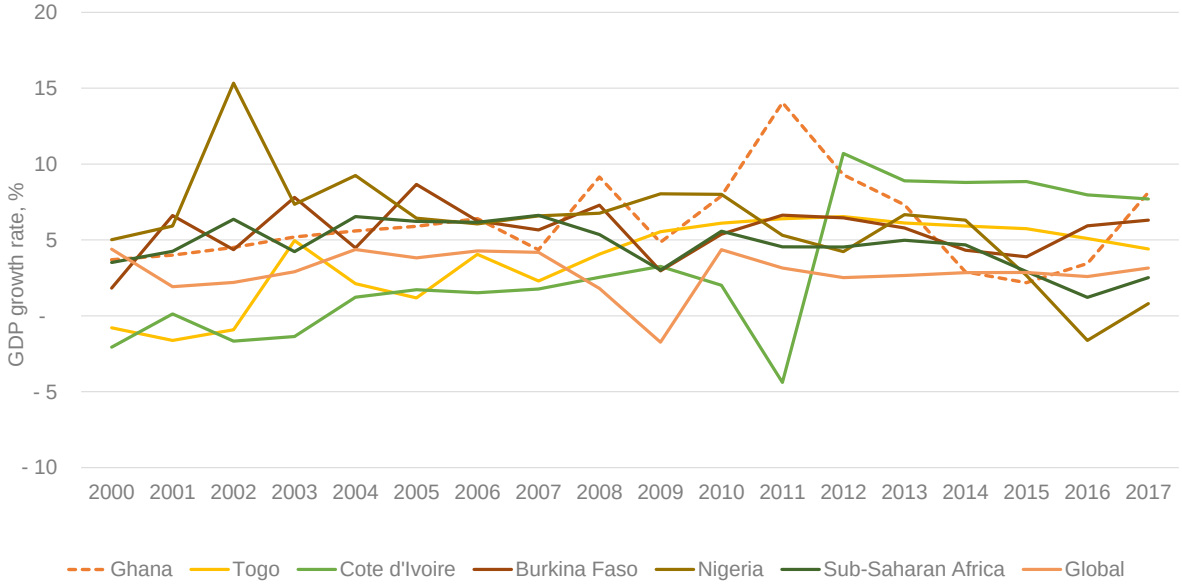
The rate of urbanisation in Ghana has accelerated of late. It increased from 50% in 2009 to 56% in 2018 (World Bank, 2019). The rising urban population is expected to stimulate demand for goods and basic services including social amenities and infrastructure. A development strategy built around turning cities into drivers of growth is therefore relatively low risk since demand for these goods and services are likely to remain strong in future. Focusing on urban demand could therefore also be a dependable strategy to support long-term economic growth and further address poverty.

4 GHANA ECONOMIC TRENDS

4.1 Economic growth and sectoral composition

Ghana's recent economic performance is impressive compared to historic levels. During the immediate pre-reform period (between 1975 and 1983), the Ghanaian economy went into a recession with an average GDP growth rate of -2.5% (Danquah, M., & Iddrisu, A.M., 2016). This episode of poor growth performance was attributed to the poor-quality of national economic policies and several policy reversals (see Aryeetey & McKay (2007)). In the post-1983 reform period, Ghana attained a strong and sustained economic growth with an average annual GDP growth rate of around 6% between 2000 and 2017 (see Figure 13). Ghana recorded a peak economic growth rate of 14% in 2011 which as due largely to the inclusion of the oil and gas sector in the economic landscape of Ghana.

Figure 13: Ghana's GDP growth rates versus WAC, Sub-Saharan Africa and Global (2000 - 2017)

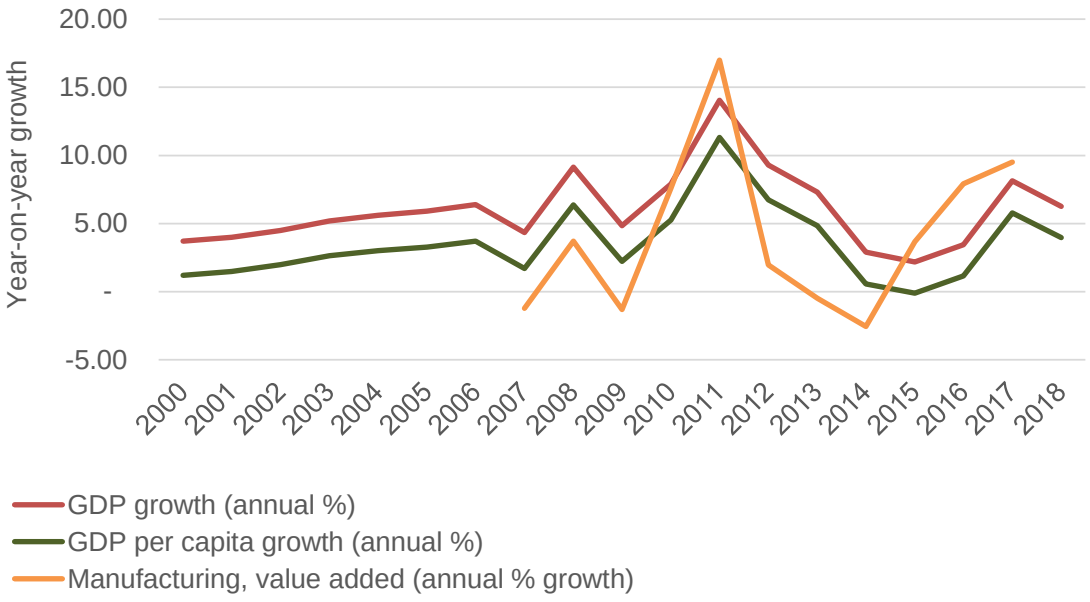


Source: (World Bank, 2019)

While Ghana's mean growth rate (4.8%) in the last five years is lower than its peer countries e.g. Cote d'Ivoire (8.4%), Togo (5.5%) and Burkina Faso (5.3%), the country's economic performance compares favourably against Sub-Saharan Africa and world annual growth rates that averaged around 3.3% and 2.8% respectively, over the same period.

The growth in GDP has only been marginally faster than population growth, and as a result GDP per capita growth has not been as impressive as GDP growth. Total population has grown from 26.6 million in 2013 to 29.8 million by 2018. The evolution of Ghana's GDP growth and per capita GDP growth are somewhat correlated with performance of the manufacturing sector (see Figure 14).

Figure 14: Trends in GDP, per capita GDP and Manufacturing sector's growth rates



Source: (World Bank, 2019)

Table 1: Real GDP growth projection for West African Community

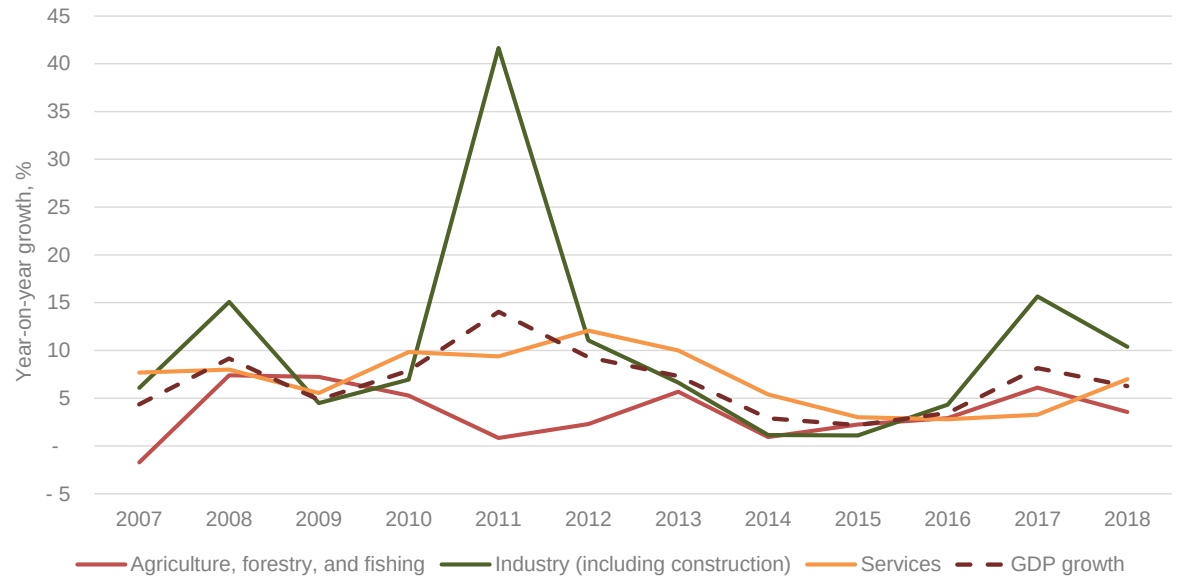
Country/region	2016	2017	2018	2019	2020
Ghana	3.4	8.1	5.6	8.8	5.8
Togo	5.1	4.4	4.7	5.0	5.3
Cote d'Ivoire	8.0	7.7	7.4	7.5	7.2
Burkina Faso	5.9	6.3	6.0	6.0	6.0
Nigeria	-1.6	0.8	1.9	2.1	2.5

Source: (International Monetary Fund, 2019)

In 2018, Ghana's economy grew by about 5.6% (lower than the World Bank estimate of 6.3%), declining from the previous year's economic growth of 8.1%. Despite this decline, Ghana's economic growth rate is expected to inch upwards to 8.8% in 2019 before moderating to around 5.8% in 2020 (International Monetary Fund, 2019). This growth projection compares favourably to the projected growth performances of neighbouring West African countries: Togo and Nigeria are expected to growth by 5% and 2.1%, respectively, in 2019 (see Table 1).

Over the past 25 years, the composition of Ghana's economic growth has transformed significantly, moving from an agriculture-leg growth trajectory towards a non-agriculture-led one. Since 2007, overall economic growth in Ghana has been driven by growth in non-agricultural sectors, notably, industry and services. Growth in the agriculture sector averages about 3.6% between 2007 and 2017, which is significantly lower than the average GDP growth rate for the country over the same period (Figure 15). However, the industrial and services sectors grew at an average of about 10% and 7% respectively, over the period. The performance of the industrial sector was significantly influenced by the introduction of the oil and gas sub-sector in 2011. These sectoral growth performances are closely linked to the evolution of sectoral shares in GDP over the period under consideration.

Figure 15: Sectoral growth rates, 2007 - 2017

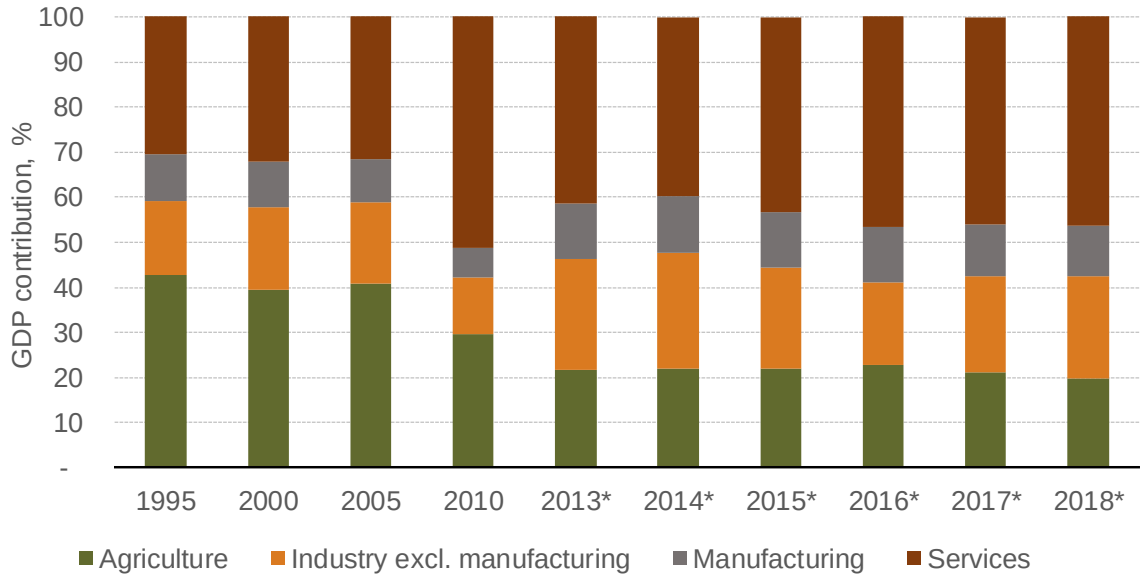


Source: (World Bank, 2019)

Much of Ghana's overall economic performance in the years prior to 2006 explained by the agriculture sector. Following the rebasing[8] of the national accounts in 2010, there was a dramatic drop in the contribution of this sector to overall GDP and an increase in the share of the services sector. Currently, services and industry (including construction and manufacturing) account for almost 80% of GDP's value addition (see Figure 16). This was a significant shift compared to the early 1990s where the agriculture sector dominated. Ignoring the values for 2010, which seem questionable and was followed by another rebasing of GDP statics, it is evident that the importance of the manufacturing sector in Ghana's GDP has not changed meaningfully since the mid-1990s.

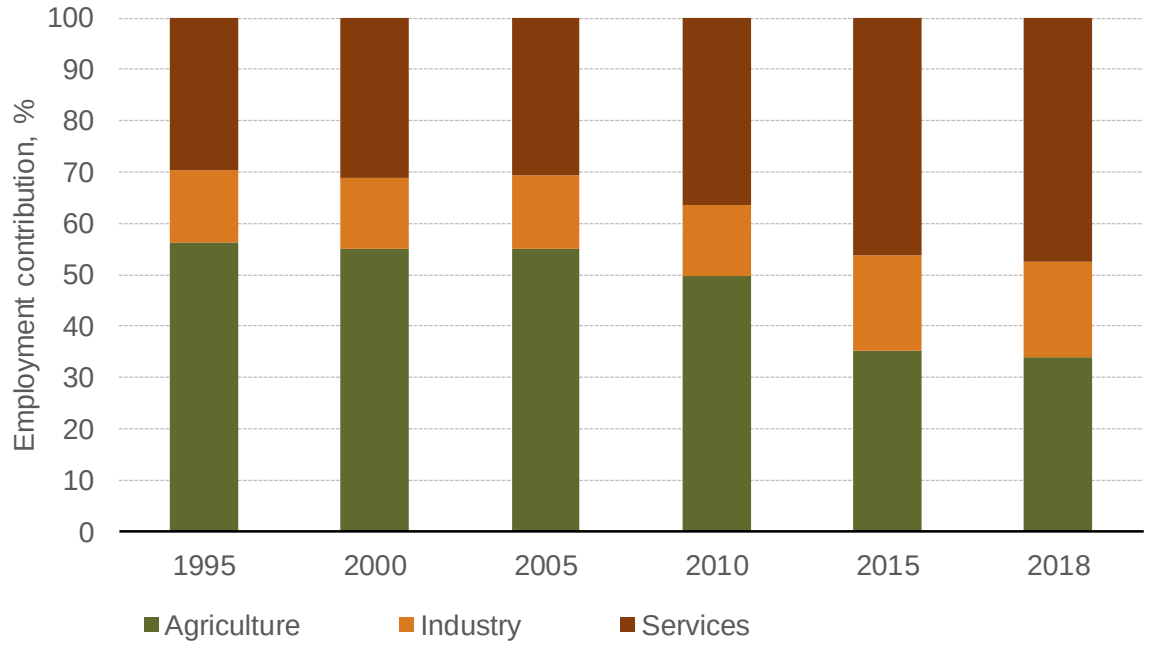
[8] The analysis of key indicators needs to be cognisant of the fact that Ghana rebased GDP twice in the last decade. The first rebase took place in 2010, when GDP was revised by more than 60% (base year was changed from 1993 to 2006). The revision showed overall growth expansion in all sectors as well as a shift in the relative economic importance of sectors. Ghana as a result moved from being classified as a low-income country to a low-middle income country.

Figure 16: GDP value added by sector in Ghana (%), 1995 – 2017



Source: (World Bank, 2019) (Ghana Statstical Service, 2019)*I*
Note: Series was constructed by combining WDI and GSS data. WDI was scaled to reach 100% to create consistent series. Data from 2013 is rebased GDP contribution estimates from GSS.

Figure 17: Employment % of total employment, by sector in Ghana, 1995 - 2018



Source: (World Bank, 2019)

The importance of the services sector towards Ghana's economy is also evident in employment contribution by sector (Figure 17). In 2018, the services sector absorbed 47.5% of total employment, which was followed by agriculture (33.9%) and industry (including manufacturing) (18.6%). Notwithstanding the dwindling contribution of the agriculture sector to overall GDP in recent times,

the agriculture sector still absorbs an important share of the Ghanaian labour force. The shares of the industrial and services sectors in total employment have increased over time; from 14% and 30%, respectively, in 1995, the industrial and services sectors accounts for 19% and 48% of total employment in 2018, respectively.

The decline in the employment share of the agriculture sector could imply a structural transformation from low to high productivity sectors. However, the shift to the services sector appears to have been towards non-tradable services such as retail and distribution services, and not manufacturing or tradable services. This could be as a result of the local barriers of growth in the manufacturing sector (Bank of Ghana, 2019) (World Economic Forum, 2017), or it could be an indication that the rise in low-cost manufacturing in the East Asia in recent decades has made it more difficult to follow historical development paths built around low cost industrialisation. Nonetheless, the move of workers largely to non-tradable services is consistent with the 'consumption city' narrative described in Section 2.

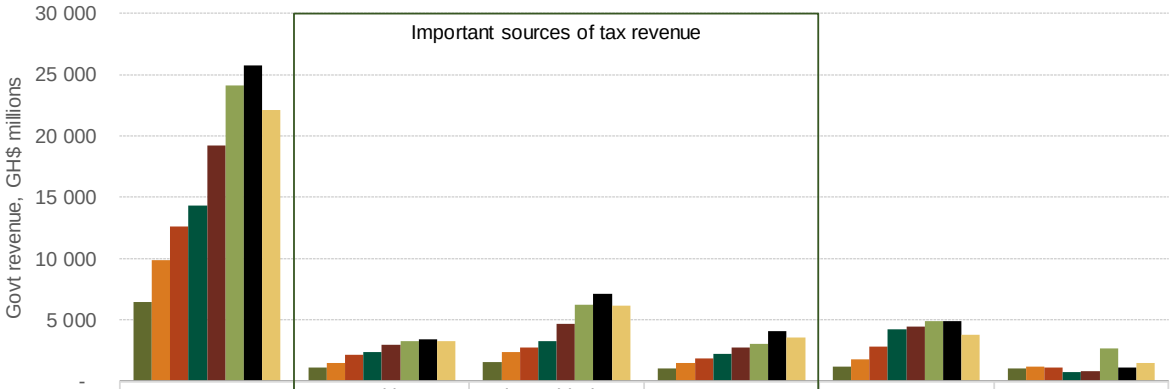
4.2 Financial indicators and investment patterns

4.2.1 Fiscal balance over time

Since 2010, Ghana's total tax revenue has been growing, largely driven by the growing tax revenue base. Between 2010 and 2017, total tax revenues in Ghana grew by over 381%; from GH¢6,504.50 million in 2010 to GH¢31,346.4 million (representing 15.5% of GDP) in 2017 (see Figure 18). Consistent with the evolution of total tax revenue, there is a consistent increase in the major components of total tax revenues over the same period. For example, revenues from personal income tax increased from GH¢1,114.8 million in 2010 to about GH¢4,909.71 million in 2017, representing an increase of 340% over a 7-year period. Similar trends are observed for revenues from value added tax (VAT) and import duties. Total non-tax revenues also witnessed an increase over the period, rising from GH¢1,226.10 million in 2010 to GH¢5,613.54 million in 2017. However, total grants receipts have stayed around GH¢1,296.27 million on average over the period.

Given the growth in government revenue, there has been decreasing reliance on official development assistance (ODA). As observed in Figure 19, even though Ghana's net receipt of ODA has increased in absolute terms since the 1990s, net ODA as a percentage of GNI has been on a downward trend since 2004, reaching its lowest value of 2.1% in 2013. The recent drop in net ODA receipts in Ghana can be explained the current government's policy of reducing the country's reliance on external aid while increasing its reliance on domestic resources to develop a "Ghana beyond aid".

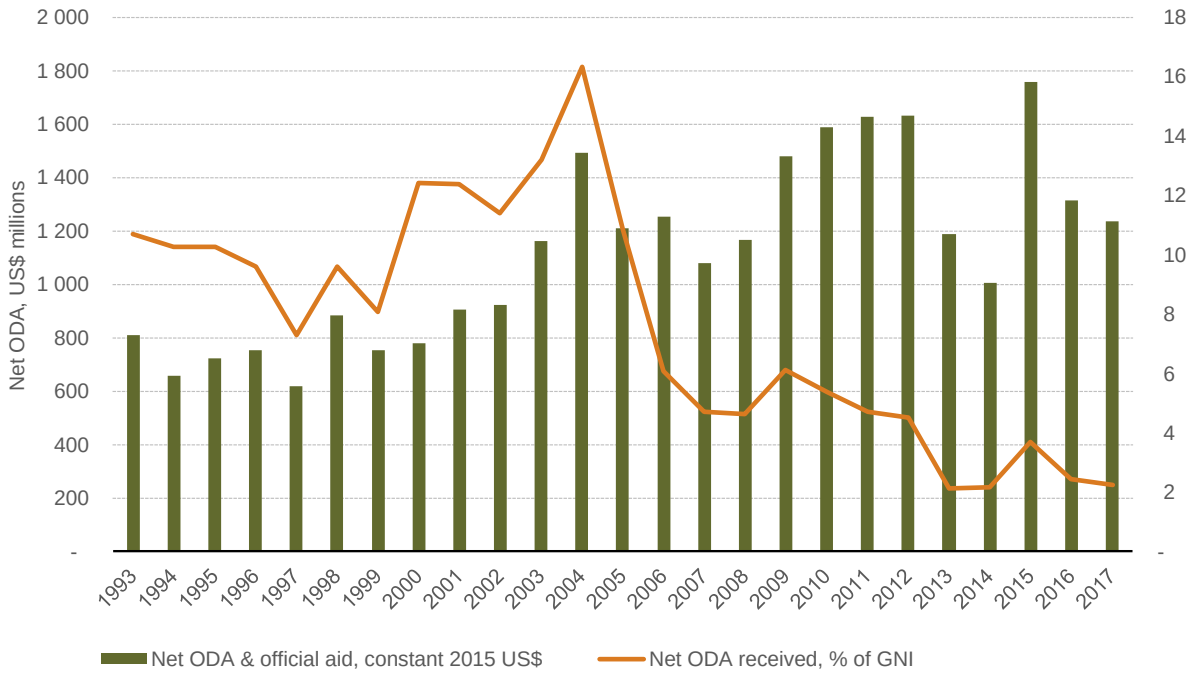
Figure 18: Government resources, GH¢ millions



	Tax Revenue	Personal income tax	Value Added Tax (VAT)	Import duties	Non-tax revenue	Grants
2010	6 505	1 115	1 618	1 052	1 226	1 080
2011	9 855	1 493	2 376	1 511	1 822	1 231
2012	12 655	2 204	2 777	1 887	2 853	1 160
2013	14 308	2 367	3 317	2 231	4 265	739
2014	19 230	3 000	4 672	2 773	4 483	814
2015	24 141	3 310	6 254	3 078	4 921	2 689
2016	25 729	3 466	7 130	4 122	4 882	1 141
2017	22 136	3 322	6 176	3 556	3 833	1 515

Source: (Government of Ghana, 2017)

Figure 19: Official development assistance and aid, US$ 2015 constant prices



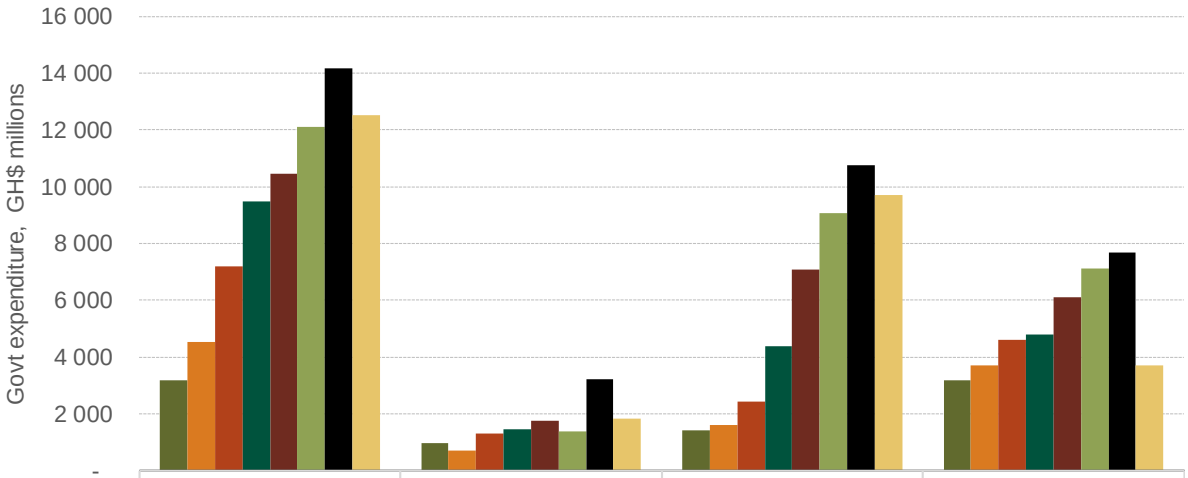
Source: (World Bank, 2019)

Often, the mobilisation of revenues coincides with growing public expenditures. This is the case in Ghana, where total public expenditure has been on the rise since 2010, mainly constituted by

personnel emoluments i.e. wages and salaries that constitute 46.3% of total tax revenue and 5.9% of GDP in 2018 (see Figure 20).

Between 2010 and 2017, the percentage increase in expenditure on personnel emoluments and interest payments is 435% and 823%, respectively. Public expenditure on the use of goods and services, and on capital items has an uneven pattern over the 7-year period. During the 2017 fiscal year, the amounts of public expenditures on the use of goods and services and on capital items dropped significantly relative to their previous year's levels. The lower expenditure on the use of goods and services and on capital items (financed domestically) were attributed to the implementation of expenditure rationalisation measures by the government (Government of Ghana, 2017). There is a risk that declining expenditure on goods and services and capital items coupled with increasing expenditure of personnel expenditure may negatively impact the productivity of the civil service in Ghana by depriving civil servants of the equipment and support services they need to do their jobs.

Figure 20: Government expenditure, GH¢ millions



	Compensation of employees	Use of goods & services	Interest Payments	Capital Expenditure
2010	3 183	962	1 439	3 169
2011	4 535	724	1 611	3 725
2012	7 178	1 322	2 436	4 616
2013	9 479	1 449	4 397	4 791
2014	10 467	1 777	7 081	6 096
2015	12 111	1 388	9 075	7 134
2016	14 165	3 221	10 770	7 678
2017	12 512	1 833	9 710	3 696

Source: (Government of Ghana, 2017)

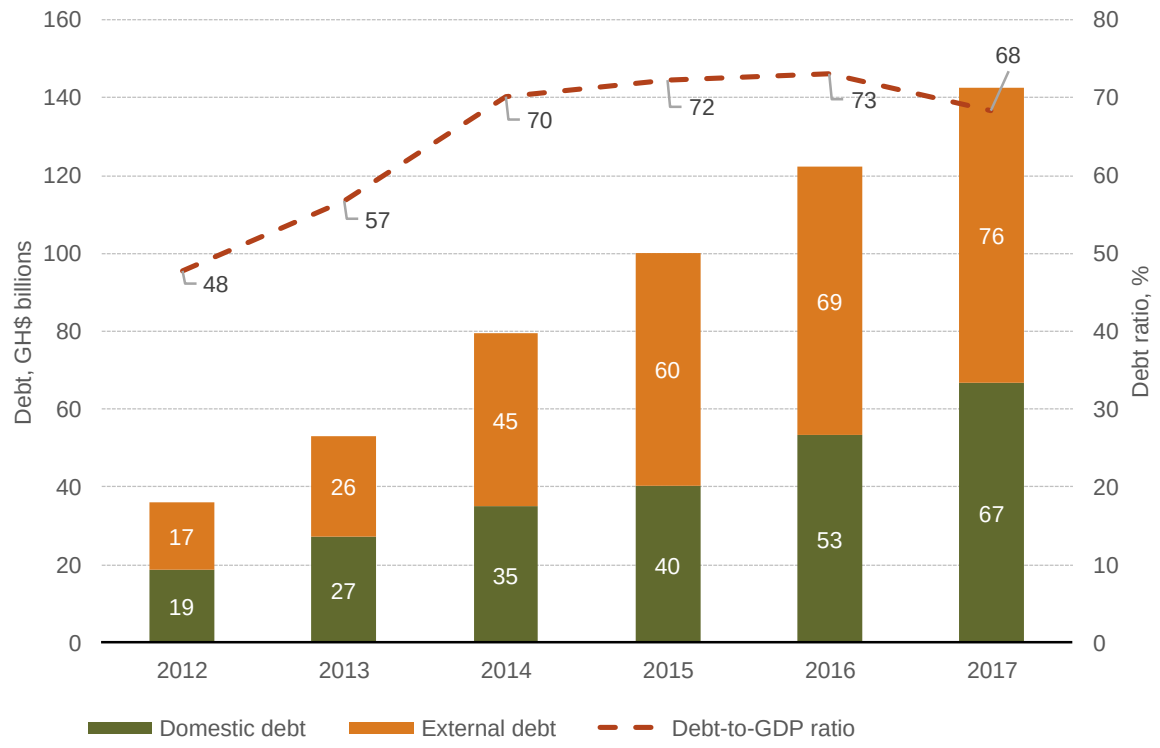
The government of Ghana, in its 2019 budget statement reiterated its commitment to reducing the budget deficit and stabilising the public debt in the medium-term. Specifically, the government intends to maintain a budget deficit of not more than 5% of GDP in each fiscal year. However, over the medium term, the fiscal deficit is expected to fall and stabilise at below 4% of GDP (see Government of Ghana (2018)). To achieve this, the government sought to reform and strengthen government

revenue while containing expenditures. On the revenue side, the government has embarked on several tax administration reforms (such as the introduction of the Fiscal Electronic Devices to deepen VAT penetration, and the Excise Tax Stamp Policy) and compliance efforts as well as broadening the tax net. In terms of expenditure, there are reforms that will ensure efficiency by reducing waste and minimising opportunities for corruption.

4.2.2 Public debt

An important feature of Ghana's fiscal landscape is the steep rise in the public debt stock, with the debt-to-GDP ratio increasing from 32% in 2008 to over 68% in 2017, peaking at 73% in 2016 (Government of Ghana, 2017) (see Figure 21). The high interest rate payments alluded to previously are linked to Ghana's high level of indebtedness.

Figure 21: Trends in Public Debt, GH¢ Billions



Source: (Government of Ghana, 2017)

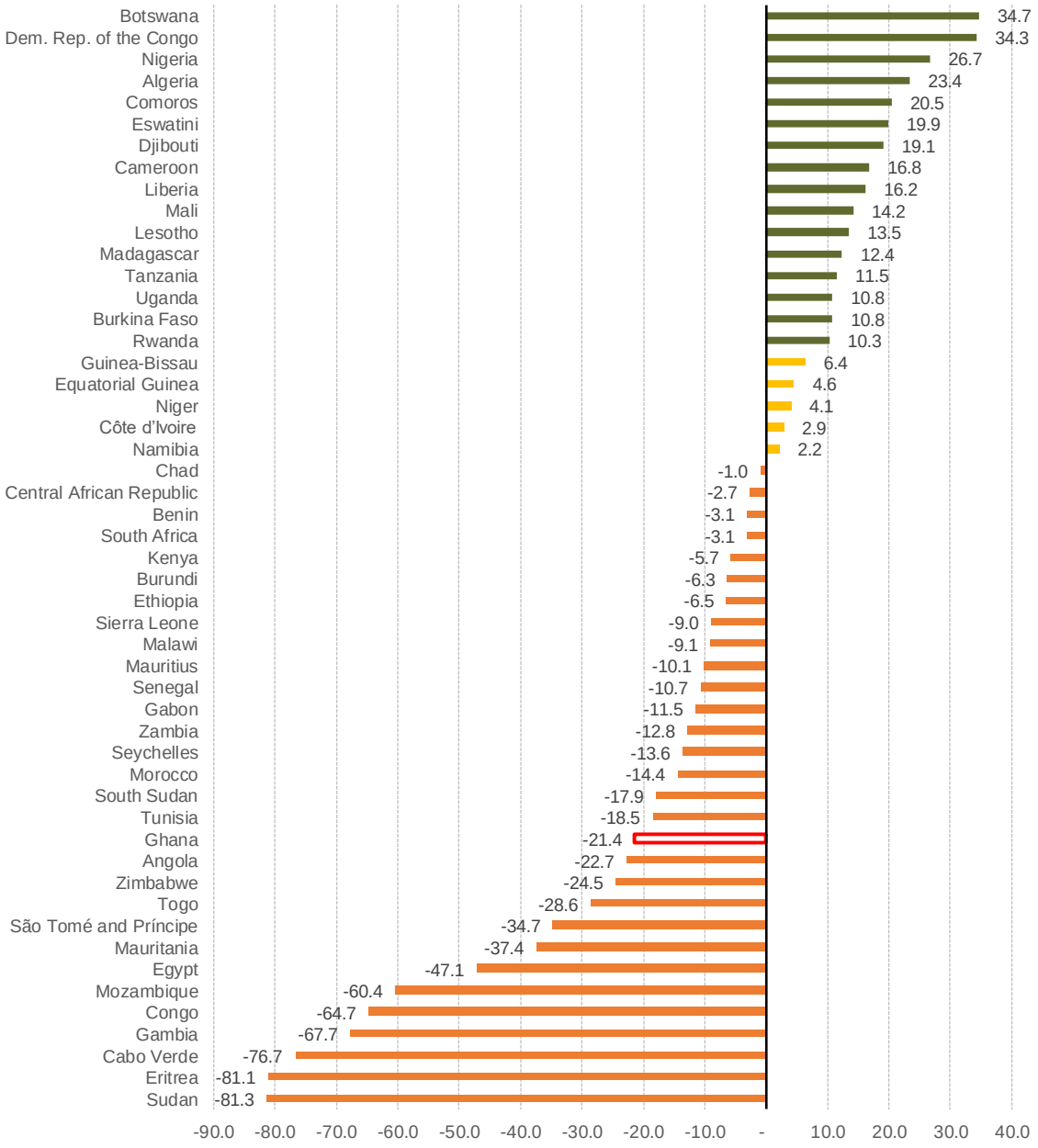
Historically, government's budget deficit has been financed somewhat equally through domestic and external sources.[9] From 2014, most of the debt has been financed by external sources: in 2012, domestic debt financing stood at 52%, and by 2017, this had declined to 47%. This may be because the domestic market is not able to keep up with government financing requirements, or that the

[9] External debt is a foreign debt or debt owed to individuals or corporations that are not citizens or Ghanaian owned establishments.

government is able to secure better financial terms abroad (see Figure 21). The high interest rate payments alluded to previously are linked to Ghana's high level of indebtedness.

The IMF suggests a debt-to-GDP ratio of 50% as safe debt limit for developing countries (Pienkowski, 2017). The Economic Commission for Africa analysed the fiscal space in Africa relative to this threshold. This considers how much countries can still safely borrow given their current debt levels (taken as an average from 2016 to 2018) relative to the aforementioned threshold (ECA, 2019). Ghana is identified as one of the Africa countries that have already exceeded the 50% debt limit and thus has limited fiscal space available to deal with economic shocks (see Figure 22).

Figure 22: Ghana's fiscal space relative to other African countries (average 2016-2018)



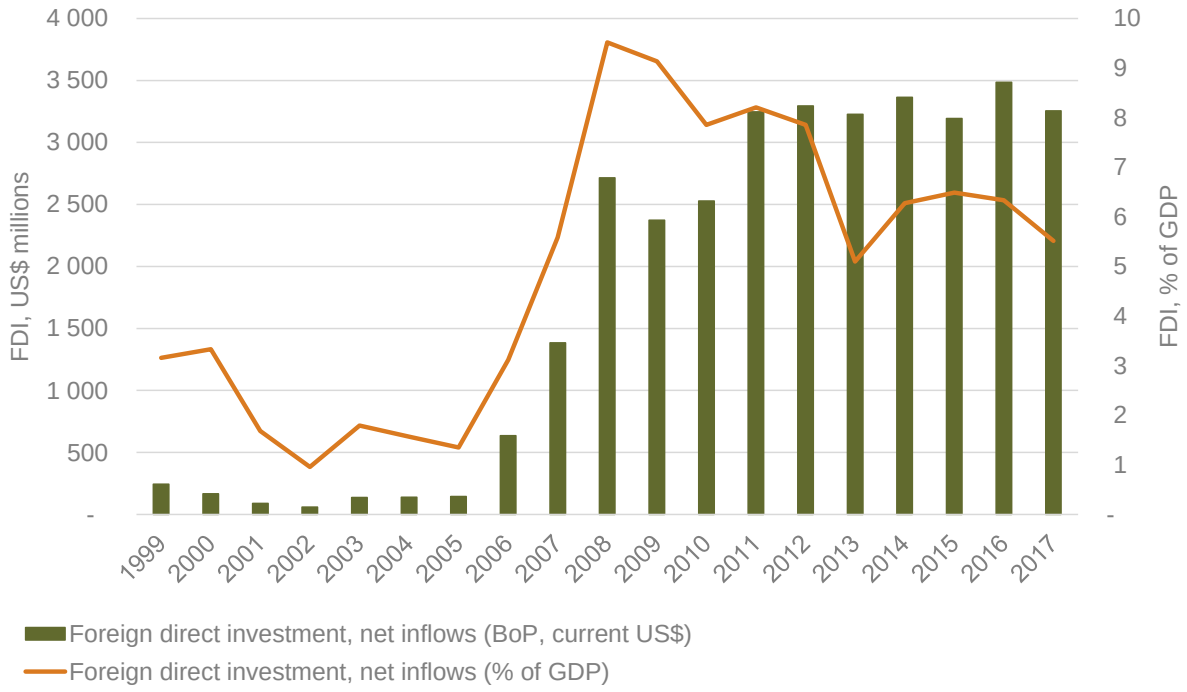
Source: (ECA, 2019)

4.2.3 Investment patterns

This section discusses the trends in investment flows with a focus on foreign direct investment (FDI) and gross capital formation (GCF). The inflow of foreign direct investment (FDI[10]) into Ghana has increased significantly over the past decade for two main reasons. First, the discovery of oil in commercial quantities in the country in 2007 led to significant investments in oil exploration and refining. Second, several reforms introduced in the business environment encouraged foreign participation. Together, these two shifts attracted foreign investment into Ghana, overall improving the FDI to GDP ratio improve.

From 0.96% in 2002, the FDI-to-GDP ratio increased significantly over time to hit 9.52% in 2008 before declining to 5.52% in 2017 (Figure 23). In terms of value, we observe that while the amount of net FDI inflows in Ghana average around US$139.43 million between 1993 and 2005, by 2017 FDI amounted to US$3,254 million in 2016. Most of the FDI inflows in the country are in the industrial sector, particularly manufacturing and, mining and quarrying.

Figure 23: Foreign direct investment* flows

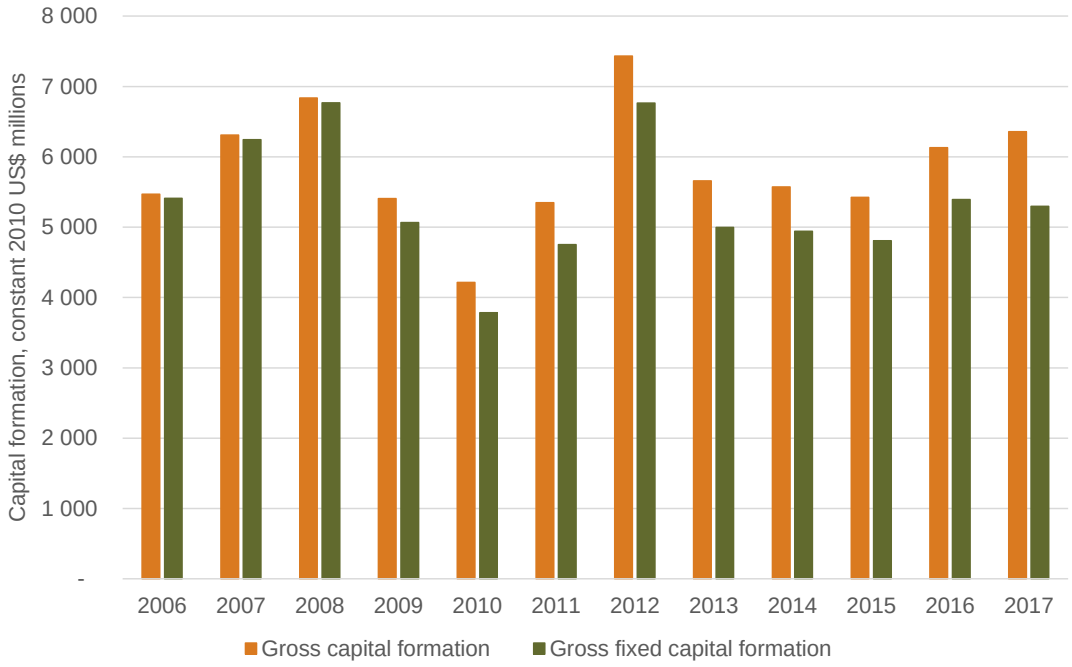


Source: (World Bank, 2019)

[10] Foreign direct investments are the inflows of investment to acquire a lasting management interest (10 percent or more of voting stock) in an enterprise operating in an economy other than that of the investor. It is the sum of equity capital, reinvestment of earnings, other long-term capital, and short-term capital as shown in the balance of payments. FDI thus reflects longer-term investments in a country.

Ghana's domestic investment (i.e. gross capital formation (GCF))[11] has averaged around US$5.8 billion per annum between 2006 and 2017 (Figure 24). In 2006, the amount of GCF and gross fixed capital formation (GFCF) stood at US$5.5 billion and US$5.4 billion, respectively. Thereafter, we observe a consistent increase in GCF and GFCF for the fiscal years 2007 and 2008 (US$ US$6.8 billion) before falling consistently in 2009 and 2010 fiscal years. The values of GCF and GFCF recovered afterwards, registering their highest levels of US$7.4 billion and US$6.8 billion, respectively in 2012. The difference between GCF and GFCF is accounted for by increases in inventory and acquisitions of valuables held as investments e.g. precious metals or stones. Recent fixed domestic investments are connected to government's capital investment in various infrastructure projects including the construction of the Kotoka International Airport Terminal 3, the upgrade of the Tamale and Kumasi Airports, and the construction of numerous road projects across the country.

Figure 24: Gross capital formation, constant 2010 US$



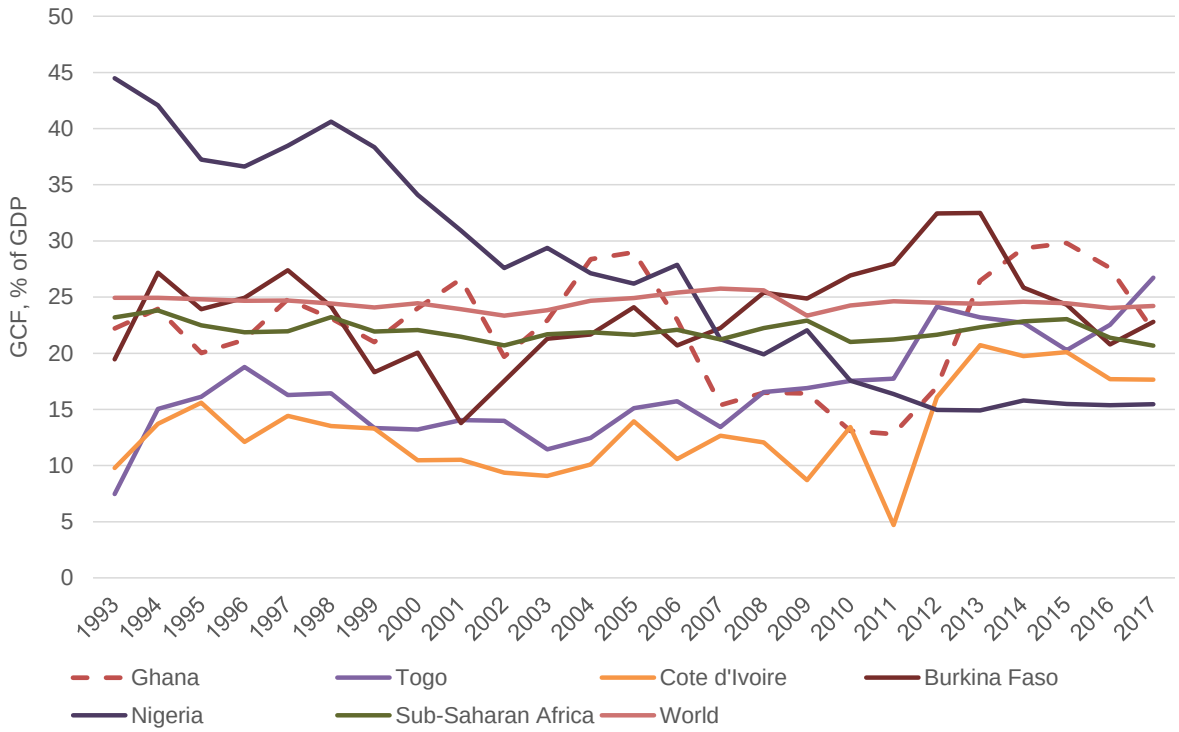
Source: (World Bank, 2019)

While Ghana has been able to consistently attract investment (including foreign investment), the level of investment is vital should it have an impact on economic development and job creation. On average, countries GCF amounts to 24% of GDP and Ghana does not fall too far from this average. Between 2012 and 2017, Ghana's investment was approximately 25% of GDP (Figure 25). From the figure below, we see that Ghana's GFC is cyclical in nature, similar to peer countries. This may

[11] Gross capital formation is a sum of gross fixed capital formation **plus** changes in inventory **plus** the net difference in acquisition and disposal of valuables. It includes local investment and FDI. Gross fixed capital formation is the acquisition less disposals of tangible and non-tangible fixed assets including machinery and equipment, building, and computer software. In most cases, GFCF is the largest component of GCF (http://siteresources.worldbank.org/ICPINT/Resources/ch9.doc).

be explained by the fact that large capital projects tend to receive once off payments that is invested over multiple years. Nonetheless, it is important to ensure that the level of GCF is normalised over time.

Figure 25: Gross capital formation comparison, % of GDP



Source: (World Bank, 2019)

4.2.4 Financial sector development

Ghana's financial sector (along with the share of Ghanaians with access to formal financial services) has grown rapidly since 2010. Financial sector assets increased from 53% of GDP in 2010 to 78% in 2017. The financial sector remains bank-dominated and has failed to attract diverse private financial institutions. Universal banks dominate the sector, with assets equivalent to 46% of GDP in 2017, followed by the fund management sector (15%) and pension funds (12%). A significant part of the financial sector is state-owned, and this increased in 2018 with the state owning four major banks (Geiger, et al., 2019).

In addition to the banks, there are many (non-bank) Specialized Deposit-Taking Financial Institutions and informal institutions that serve the financially excluded segments of the population. These include microfinance institutions (MFIs), rural and community banks (RCBs), Susu Collectors, savings and loans companies (S&Ls) and finance houses (FHs). S&Ls and FHs are relatively larger and focus on consumer savings, while RCBs are owned and governed by local communities and tend to offer more services including savings, credit and payment services to less included groups e.g. women, the poor and rural residents.

In the early 2000s, Ghana's financial sector went through a liberalisation agenda in order to integrate the domestic economy with global financial markets and support economic growth through competition, innovation, and more importantly financial inclusion. These changes paved way to the emergence of new banks. However, in 2012, Ghana faced several macro shocks from external and internal sources, putting undue stress on the banking system. The economy was characterised by large fiscal and current account deficits, a high and volatile exchange rate, and high inflation levels. Additionally, governance challenges in the banking systems worsened, weakening the financial sector supervision and regulation, while corporate governance structures were completely disregarded. As a result, most banks' balance sheets deteriorated (Bank of Ghana, 2018).

An Asset Quality Review conducted by the Central Bank of Ghana (BoG) in 2016 identified that the quality of banking sector's assets had severely deteriorated because of the substantial under-provisioning for bad debts. This resulted in a decline in credit to the private sector and higher lending rates, undermining the performance of the real economy. To alleviate the stress, the BoG extended Emergency Liquidity Assistance to ailing banks (some of which was uncollateralised – transferring significant risk from the banks to the BoG). The official liquidity injection plus the banks' reluctance to extend new credit increased excess liquidity in the economy, which became expensive for the BoG to sterilise to stem future inflationary fears (Bank of Ghana, 2018).

In August 2018, the financial sector came under enormous stress, with the resolution of five domestically owned universal banks[12] at substantial cost to the government. These banks assets were transferred to a state-capitalised bank, the CGB, and a domestic bond was issued to offset the difference between liabilities and assets transferred to the CGB. The total fiscal costs for this financing amounted to 3.4% of GDP in 2018. Early in 2019, the BoG closed two more banks (Premium Bank and Heritage Bank). This impacted the fiscal deficit which in 2018 reached 7.2% of GDP (Geiger, et al., 2019).

Challenges in the financial sector extended to the microfinance sector. The extent of financial distress was characterised by severely impaired capital, inability to meet regulatory capital adequacy requirement; generally low asset quality; and liquidity crises. Consequently, this threatened depositor's funds, eroding public confidence and undermining efforts to promote financial inclusion. The Bank of Ghana released statistics in 2018 indicating that:

- Out of 707 institutions in the micro-finance sector, 272 are at risk
- Of the 566 licensed MFIs, 211 are active but distressed or folded up
- Of the 141 RCBs, 37 are active but distressed or folded up

All in all, approximately GH₵740.5 million is owed to 705,396 depositors by the distressed or folded up MFIs and RCBs. The deposits under distress form 8.81% and 52.49% of total RCBs and MFIs deposits respectively.

[12] The government closed down uniBank, Royal Bank, Beige Bank, Sovereign Bank, and Construction Bank, in August 2018, and transferred their assets and liabilities to a bridge bank (the CBG).

Many of the financial institutions are not operating in a safe and sound manner and are in contravention of prudential norms. Since most distressed entities do not have recoverable assets, their resolution will be costly if the forfeiting of depositors' funds is to be avoided. Given these challenges, the BoG revoked licences of 347 microfinance companies and 39 micro-credit companies in May 2019 (Geiger, et al., 2019).

In response to the financial sector stress the Bank is taking several measures to strengthen the financial sector. First, increased the minimum capital requirements to GH₵400 million, up from GH₵120 million. This led to the sectors consolidation and the downgrading of one bank to a savings and loans, and another bank was converted into a Trust, a vehicle to pool funds. Second, from an administrative process, the BoG is improving the implementation of the new capital requirements, enforcement of prudent standards, and introducing new risk management and corporate governance directives among other interventions (Geiger, et al., 2019). Third, the Bank of Ghana has also established a Financial Stability Council to, on an on-going basis, assess the stability of the banking system. The Ghana Deposit Protection Corporation was also created to manage a guarantee scheme for small depositors.

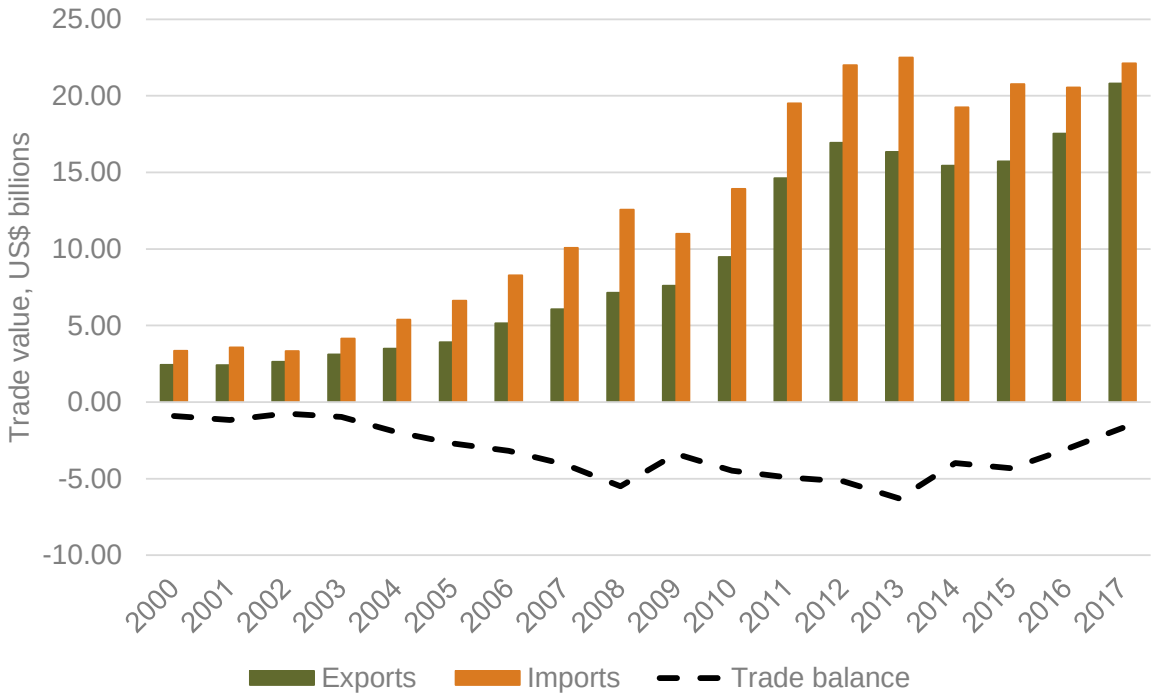
4.3 International Trade

As an open economy, Ghana depends on external trade to achieve its economic growth and development goals. More importantly, diversifying Ghana's exports will contribute towards sustaining economic development in the long run. However, Ghana primarily exports unprocessed raw products and imports high value products. In this section, we investigate Ghana's trade landscape, including trade agreements and trade patterns over time.

Ghana is a key member of the Economic Community of West African States (ECOWAS) and is also a signatory to the ACP-EU Partnership Agreement, which replaced the Lomé Convention, a trade and aid agreement between the European Union and 46 of Europe's former colonies and dependencies in Africa, the Caribbean and the Pacific (the ACP group). Ghana is also one of the beneficiaries of the U.S. African Growth and Opportunity Act (AGOA)'s quota- and duty-free access to the USA market. Ghana recently joined the African Continental Free Trade, and was selected by the Africa Union to host the African Continental Free Trade Area's Secretariat.

External trade has been a significant driver of Ghana's economic development (Institute of Statistical, Social and Economic Research (ISSER), 2012). In 2017, total merchandize trade contributed about 45% to Ghana's GDP and has shown an upward trend since 2000 (Figure 28). Petroleum exports contributes significantly to Ghana's trade balance. In 2017, for instance, Ghana exported about US$ 17.1 billion worth of crude petroleum, accounting for 17.3% of total trade exports (Observatory of Economic Complexity, 2019). Even though Ghana's trade balance has narrowed in recent years, it still remains negative.

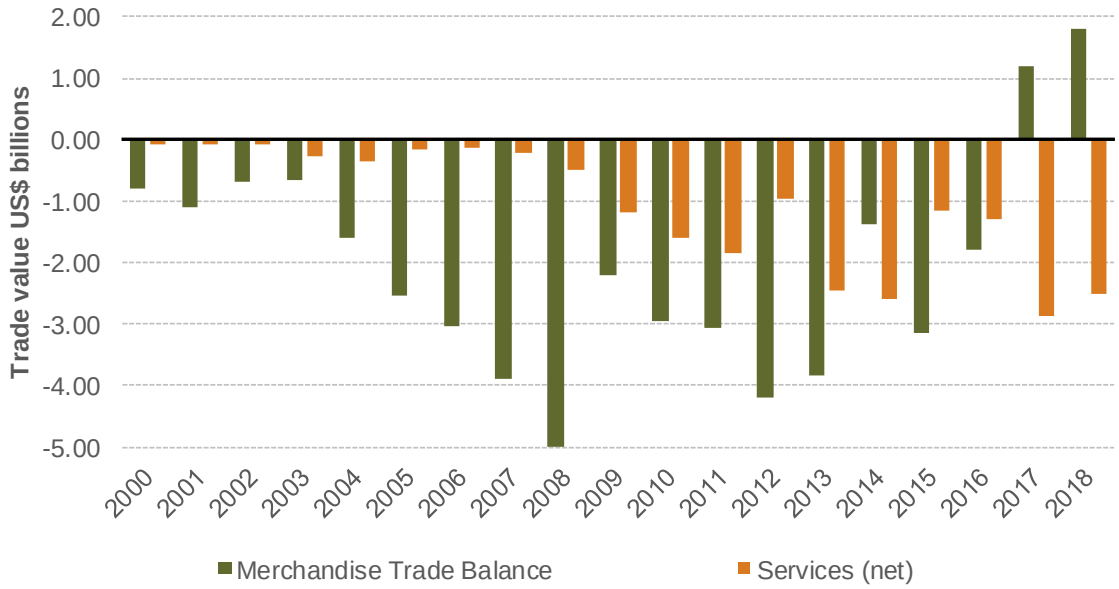
Figure 26: Ghana's world trade balance



Source: (World Bank, 2019)

Figure 27 shows that Ghana's negative trade balance is currently being driven by service imports. These have increased sharply after the discovery of oil in 2007. Since 2012 Ghana's goods trade balance has been improving, and a net goods trade surplus materialised in 2017 and 2018. This was however not enough to offset Ghana's services trade deficit.

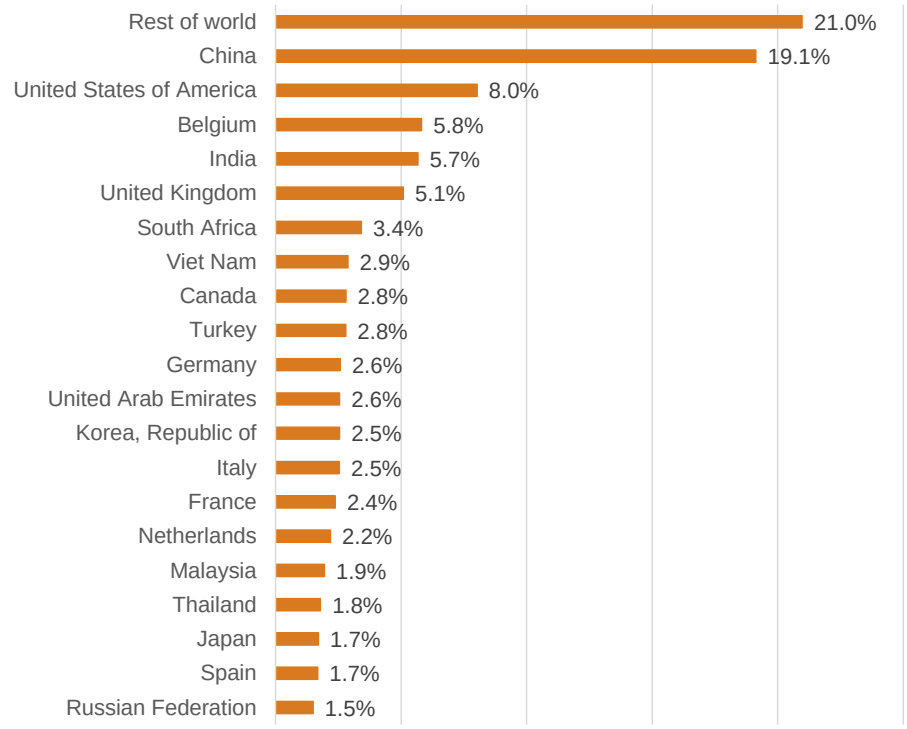
Figure 27: Ghana goods and services trade balances



Source: (Bank of Ghana, 2019)

A large proportion of imports into Ghana originated from China, standing at 19.1% in 2018. Other significant sources of imports where the USA, Belgium, India and the UK (Figure 28). These imports are mainly comprised of machinery and mechanical appliances, vehicles, aircraft and transport equipment, and mineral products (Ghana Statistical Service, 2017).

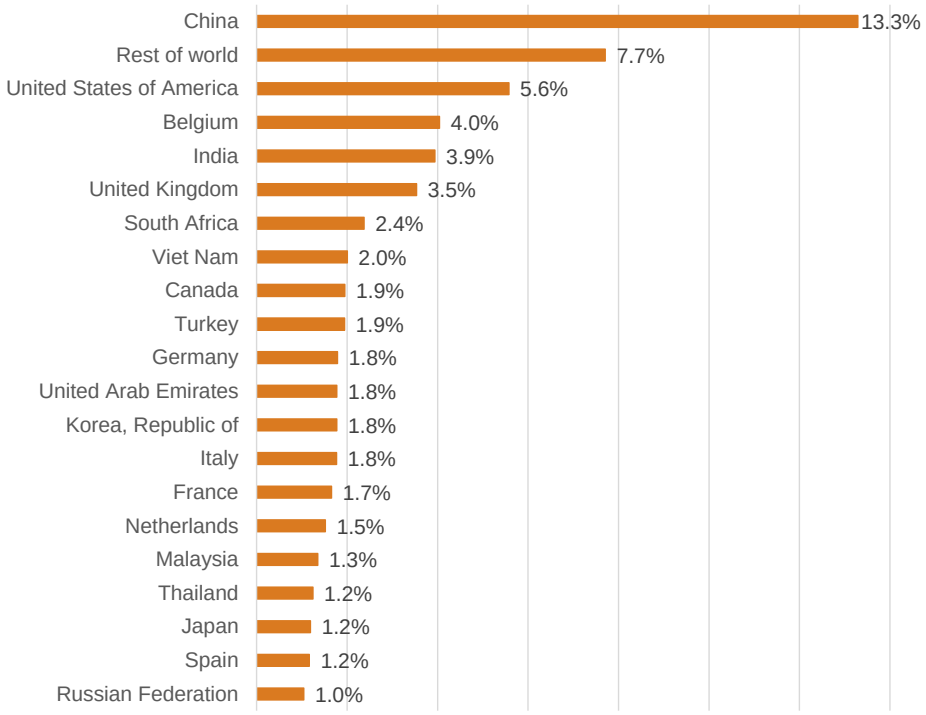
Figure 28: Imports into Ghana by country of origin in 2018, where I = US$ 11.9 billion



Source: (ITC Trade Map, 2019)

Ghana's major exports are primary products, mainly gold, petroleum oils and cocoa beans. China was Ghana's main export market in 2018, accounting for 13.3% of exports. In addition to China, only the USA account for more than 5% of Ghana's exports (Figure 29), Ghana's export earnings are concentrated in a narrow range of commodities as well as a narrow range of export markets. Ghana's trade with the rest of Africa has been minimal with just 8% of total merchandize imports from Africa and 16% of exports to Africa in 2016 (see Ghana Statistical Service (2017).

Figure 29: Exports from Ghana by country of destination in 2018, where X = US$17.1 billion



Source: (ITC Trade Map, 2019)

5 REGIONAL DEVELOPMENT PROFILES

Ghana is located on the west coast of Africa with a total land area of 238,540 km^2. The country shares border with Cote d'Ivoire to the west, Burkina Faso to the north, and Togo to the east. The Gulf of Guinea and the Atlantic Ocean borders Ghana to the south. Prior to February 2019, the country was divided into 10 administrative regions with the Greater Accra region hosting the capital city of Ghana, Accra.

There are significant geographical differences in the incidence of poverty. Consistent with earlier survey estimates, the report from the 2016/17 Ghana Living Standards Survey indicates that the incidence of poverty in Ghana is largely a rural phenomenon with more than 40% of rural dwellers deemed poor compared to just 10% of urban dwellers. Viewed in terms of regions, Ghana's poverty incidence ranges from a low of 2% in the Greater Accra region to more than 70% in the Upper West region. The three northern regions of Ghana (Northern, Upper West and Upper East regions) contribute over 40% to the national poverty incidence in 2016/17. Further, there are important variations in the incidence of inequality across regions in Ghana. The income inequality index ranges from 1.38 in the Greater Accra region to about 2.79 in the Upper West region. The observed variations in the incidence of poverty and inequality across regions and locality has important implications on the quality and inclusiveness of Ghana recent growth performances. These findings are published in the Ghana Statistical Service (2018) report.

A report published by the National Population Council (NPC) in 2017 suggest that Ghana's population was estimated at 27.8 million in 2017, with a projected annual growth rate of 2.5% (National Population Council, 2017). Further, it indicates that about 56.8% of the population in Ghana belong to the working age group (persons aged 15-64 years) while labour force participation rate for the economically active population in Ghana is 73%. The regional distribution of Ghana's population reveals that 19% of Ghanaians reside in the Ashanti region, with the next most populous regions being Greater Accra (almost 16%), Eastern region (11%), Western region (10%) and Northern region (10%).

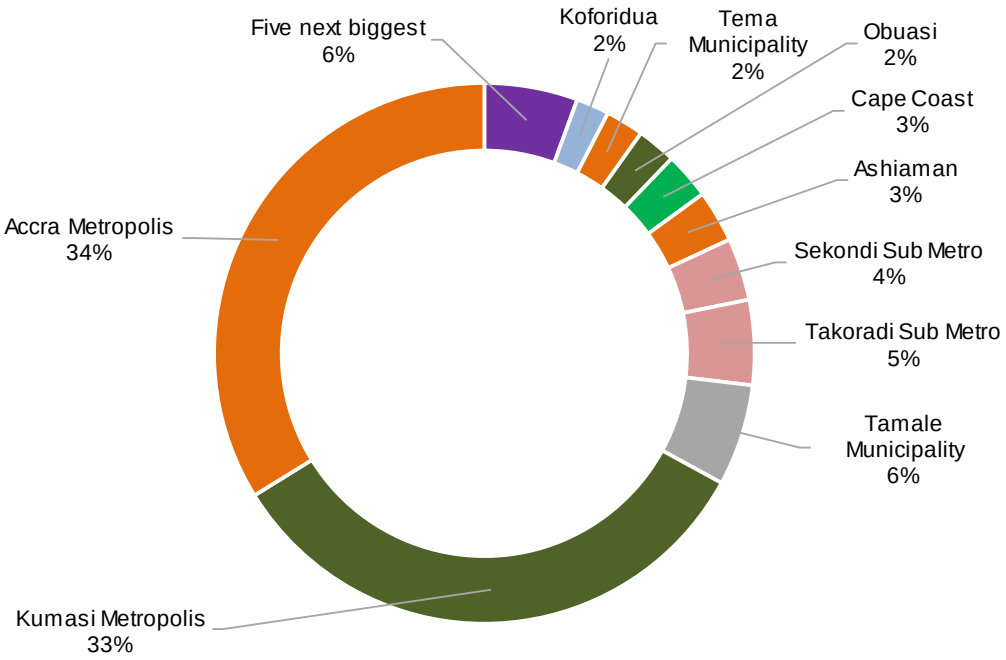
Table 2: Ghana's population in 2015 (by region)

Region	Population	Percentage of total
Western	2,820,493	10%
Central	2,396,395	9%
Greater Accra	4,507,215	16%
Volta	2,378,065	9%
Eastern	2,958,743	11%
Ashanti	5,281,509	19%
Brong Ahafo	2,599,278	9%
Northern	2,792,840	10%
Upper East	1,161,375	4%
Upper West	774,261	3%
Total	**27,670,174**	**100%**

Source: (National Population Council, 2017)

Unfortunately, the most recent data available per urban area is form of the 2010 National Population Census. The census showed that the most urbanised regions were Greater Accra (90.5%) and Ashanti (60.6%) and Central (47.1%). The most rural (least urbanised) regions were Upper West (16.3%), Upper East (21.0%) and Northern (30.3%). Now, considering the shares of urban populations in Ghana's major cities, we find that Accra and Kumasi accounted for a very similar proportion of the urban population: about 33% and 34% of the urban population in Ghana are accounted for by Kumasi and Accra respectively (see Figure 30). This incidence confirms the high level of urbanisation in these two regions.

Figure 30: Relative population distribution of largest urban centres' in Ghana (2010)

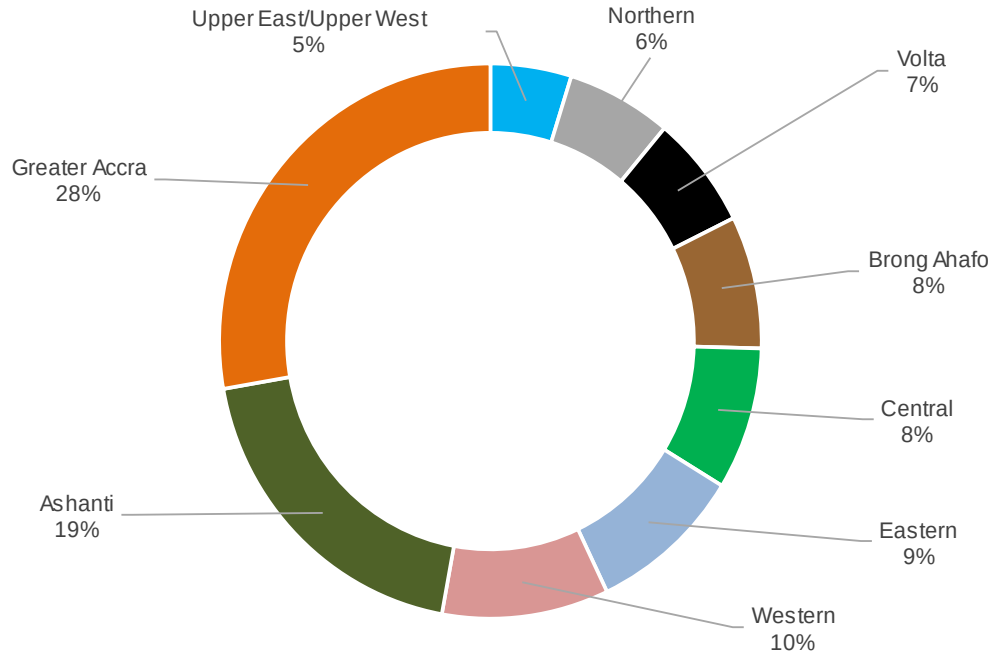


Source: (Ghana Statistical Service, 2014)

Note: The urban areas covered in the graph had a total population of 6,1 million in 2010. This accounted for 49% of Ghana's urban population and 25% of its total population in that year.

Intuitively, the population distribution should follow economic activity given that the population is drawn to areas where there is access to job opportunities and services areas. In terms of number of establishments, however, Figure 31 shows that Greater Accra accounts for a much larger percentage than the relative size of Accra. This is striking given that Table 2 showed that it was not the most populous region in 2015.

Figure 31: Distribution of business establishments, 2015 (n = 638 234 establishments)



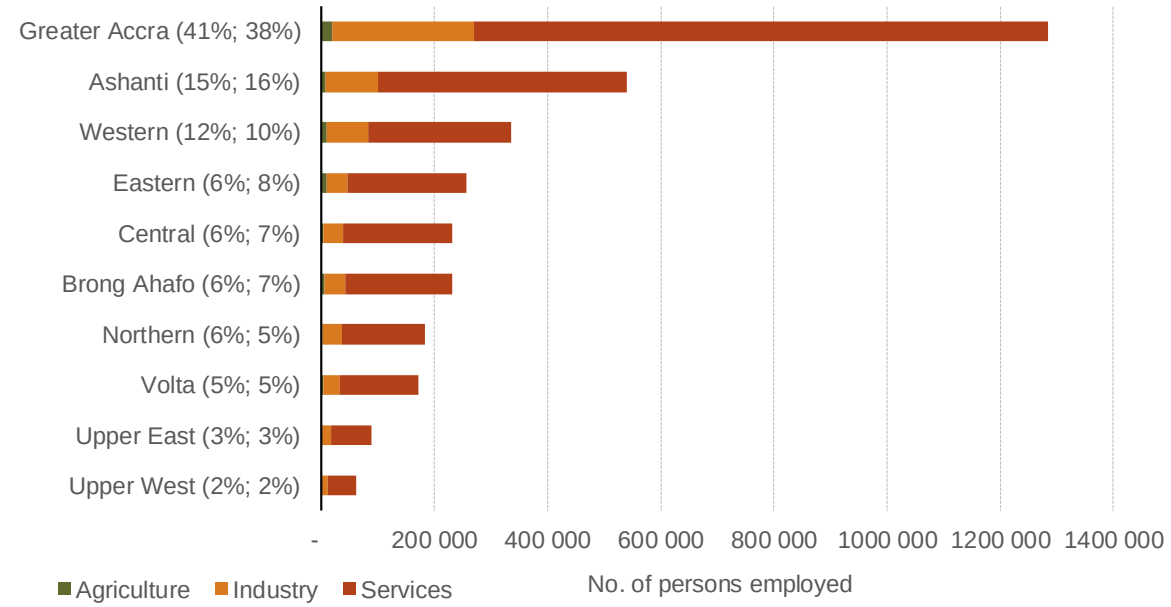
Source: (Ghana Statistical Service, 2017)

In terms of employment, however, the Greater Accra region is even more dominant – accounting for 38% of total employment and 41% of industrial sector employment in Ghana (see Figure 32). The reason for this surprising finding given Ghana's population distribution is provided in Figure 33 below. The percentage of total revenue earned in Greater Accra is much higher than the percentage of business establishments located in Greater Accra. This can be explained by the largest companies and company outlets in Ghana being located in Greater Accra. It would therefore make sense that Greater Accra also employs a disproportional number of the Ghanaian workforce. The 2014 Integrated Business Establishment Survey (GSS, 2015) found that of the 2 539 companies that employ more than a 100 people in Ghana, 1 232 (49%) are located in the Greater Accra region.

Using the regional distribution by revenue as a proxy for economic activity, Figure 33 shows that more than two-thirds of economic activity in Ghana is in the Greater Accra region. And only two other regions (Ashanti at 11% and the Western Region at 8%) house more than 5% of economic activity.

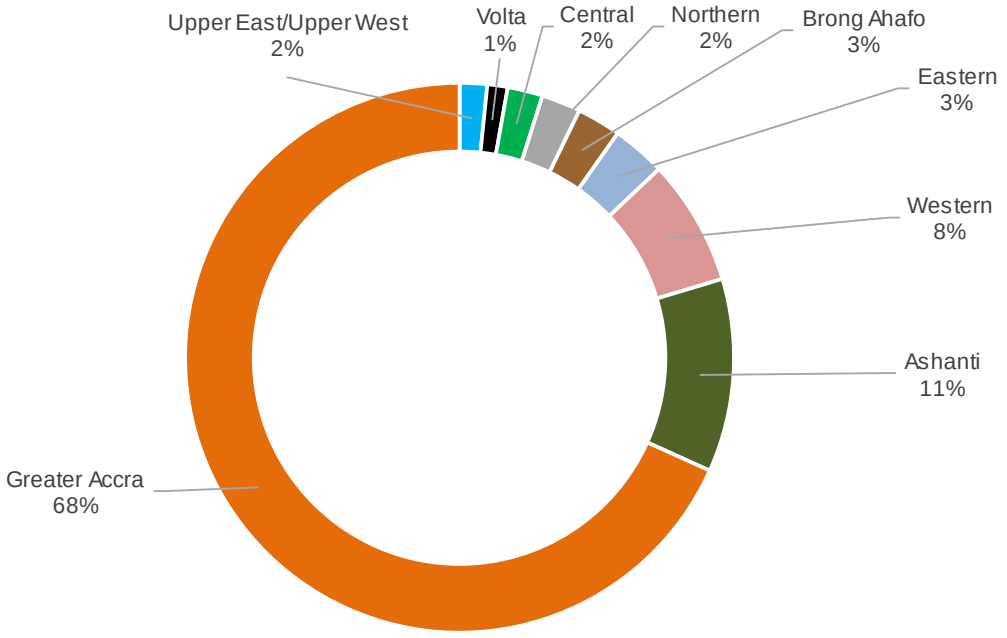
Overall, the Ashanti, Greater Accra and Western regions are the three largest regions in Ghana both in terms of economic activity, distribution of establishments, industrial employment generation and population size. Accordingly, to provide meaningful insights on Ghana's industrialisation pathway, the focus will be on these regions.

Figure 32: Number of persons employed per region (% of industrial employment; % of total employment) *



Source: (Ghana Statistical Service, 2017)
** The employment census includes both formal and informal employment, and there is no distinction made between the two.*

Figure 33: Distribution of business revenue by region (2013), (n = GH¢457 billion)



Source: (Ghana Statistical Service, June, 2018)

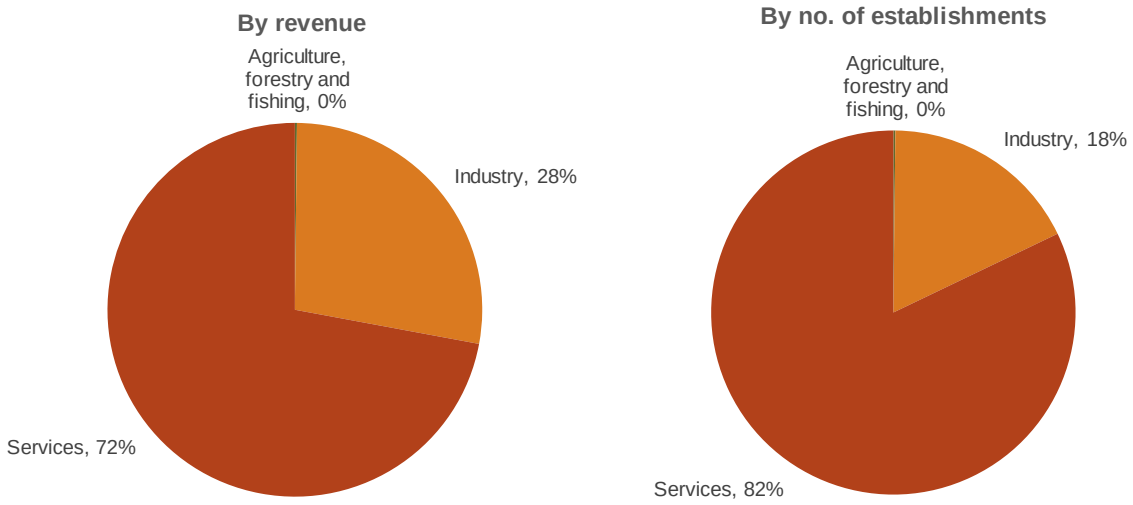
5.1 Economic activity by region

5.1.1 Greater Accra Region

Of the 16 administrative regions in Ghana, the Greater Accra region has the smallest land area occupying a total land surface of 3,245 km^2 (representing about 1.4% of the total land area of Ghana). Yet, the region is the second most populated region in Ghana (after the Ashanti region) with a population of around 4.5 million in 2015. The Greater Accra region is by far the most urbanized region in Ghana with more than 87% of its total population dwelling in urban areas. Accra is the capital city of the Greater Accra region.

Among the ten regions, Greater Accra accounts for the largest revenue base (in terms of regional economic output) in Ghana sitting at 67.3%, which is equivalent to GH¢307.6 billion. Figure 33 illustrates Greater Accra's primary activities by revenue and number of establishments. Under both metrics, the services sector contributed the largest component to this revenue base (72.1%) and number of establishments (82%), followed by industry and with very little in agriculture, forestry and fishing.

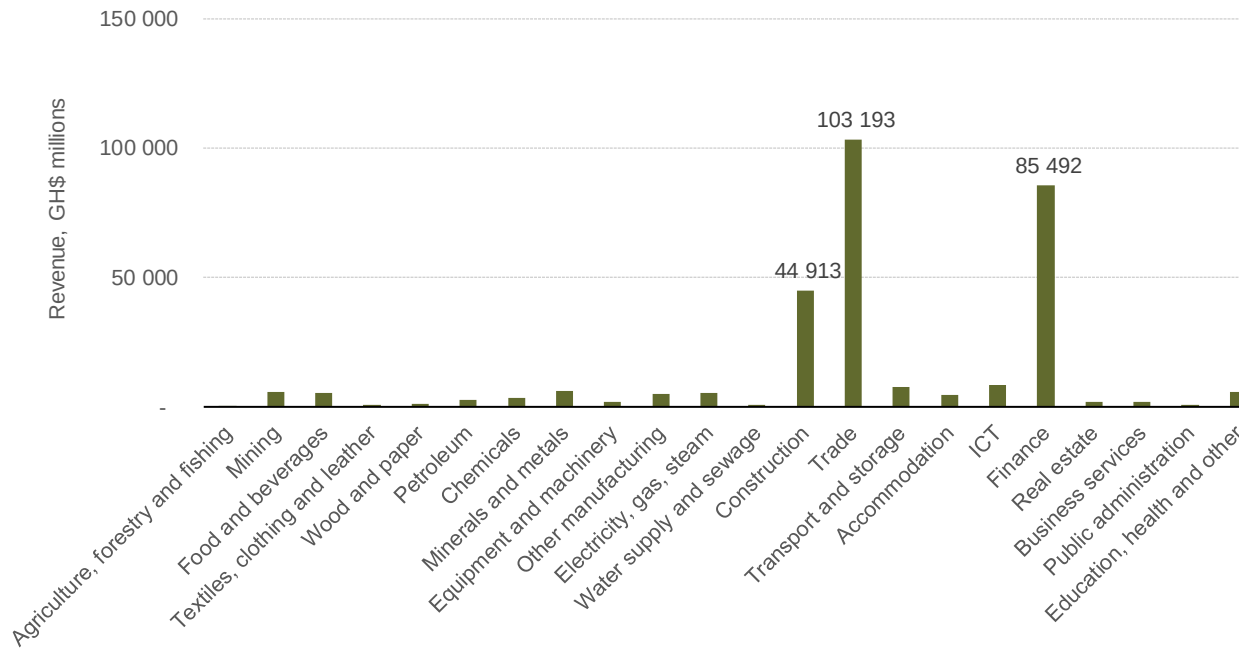
Figure 34: Distribution of Greater Accra's activity by revenue and number of activities



Source: (Ghana Statistical Service, 2017; Ghana Statistical Service, June, 2018)

A closer look at the sub-sectors (by revenue) shows that the primary activities are wholesale and retail and repairs of motor vehicles and motorcycles (33%), financial and insurance activities (27.4%) and construction (14.4%). This description is consistent with consumption cities, where manufacturing activities constitute a small proportion (9.5%) of economic activity (Figure 35).

Figure 35: Greater Accra region sectoral distribution by revenue, total revenue = GH¢307.6 billion



Source: (Ghana Statistical Service, June, 2018)

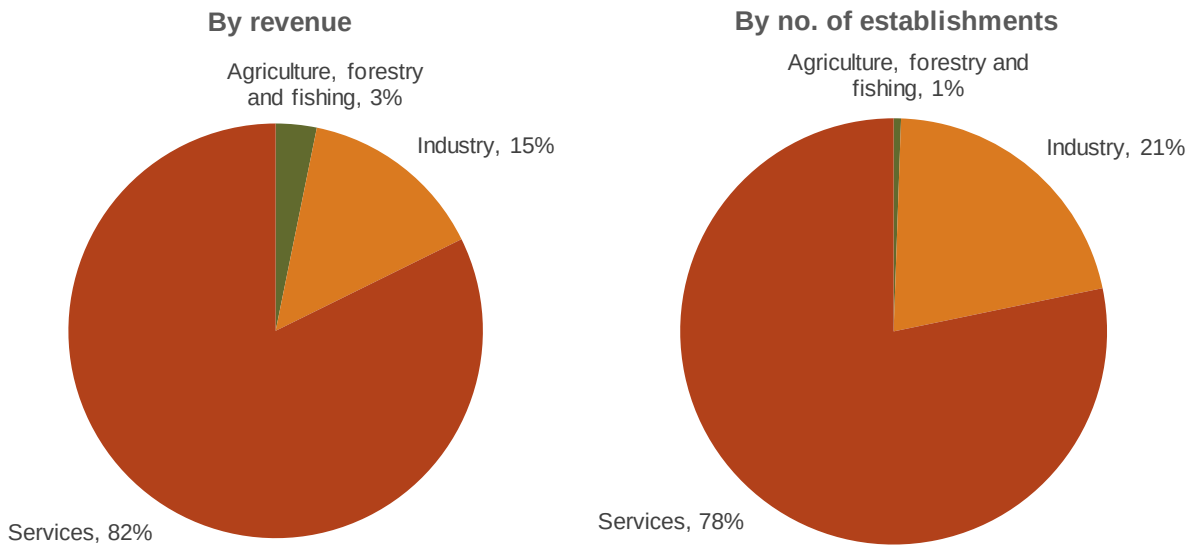
Considering the urbanisation and industrial development literature summarised in Section 2, it is interesting to note that while Greater Accra does have a noticeable manufacturing presence, revenue from this sector is dwarfed by services. Of the three regions considered in this section, Greater Accra is the only one where what potentially tradable services (Financial and insurance activities) make up a sizeable proportion of the revenue from the services sector.

5.1.2 Ashanti Region

Ashanti region occupies a total land area of 24,389 km^2 (or 10.2% of Ghana's total land area), making it the third largest region in Ghana. It is the most populated region in the country, accounting for more than 19% of Ghana's population in 2015. The Ashanti region has a per capita GDP of about $2,500 in 2013 with a population density of 200/km^2. Kumasi is the largest and the capital city of the region.

Ashanti accounts for the second largest amount of business revenue in Ghana, 11.4 % (equal to GH¢52.0 billion) of total business revenue. Figure 36 illustrates Ashanti's primary activities by revenue and number of establishments. In terms of revenue, economic activity in Ashanti is predominantly services (82.3%), followed by industry (14.5%) and agriculture, forestry and fishing (3.2%). The same distribution is true when looking at number of establishments.

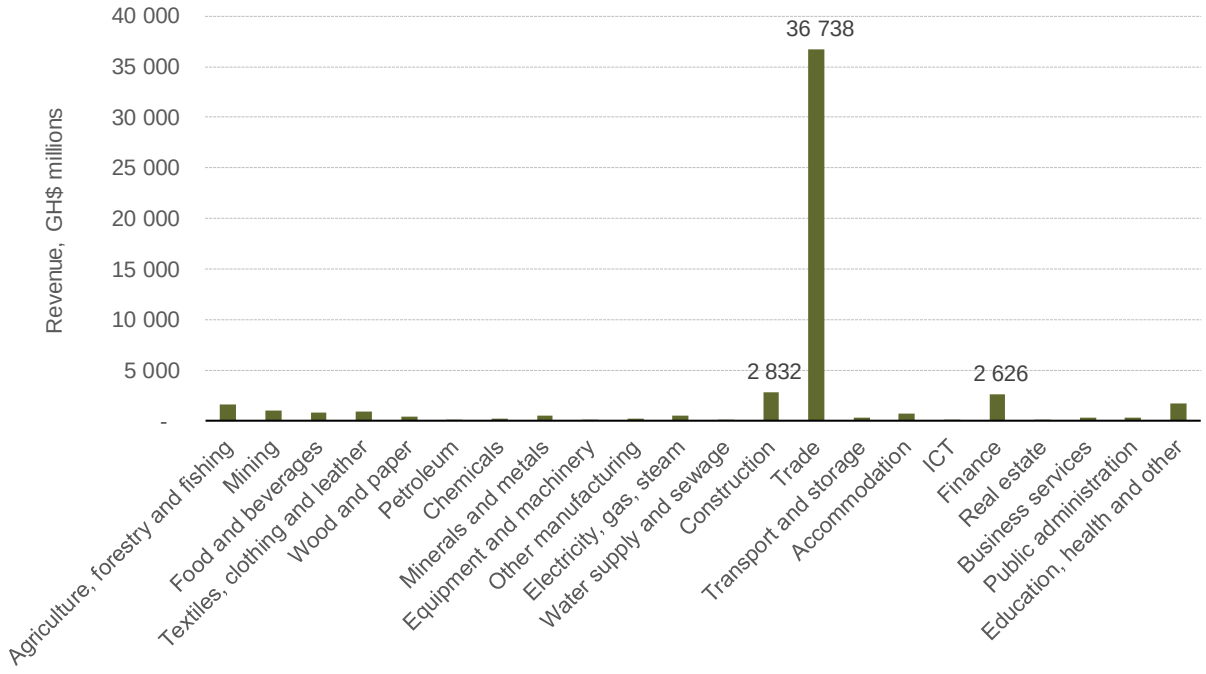
Figure 36: Distribution of Ashanti's economic activity by revenue and number of establishments



Source: (Ghana Statistical Service, 2017; Ghana Statistical Service, June, 2018)

Economic activities in the city largely revolves around the service industry. Within services, economic activity is more concentrated in wholesale and retail and repairs of motor vehicles and motorcycles (70%). Other sectors contribute small proportions to total revenue with 6.2% from manufacturing and 5.5% from construction (Figure 37).

Figure 37: Ashanti Region sectoral distribution by revenue, total revenue = GH₵52.0 billion



Source: (Ghana Statistical Service, June, 2018)

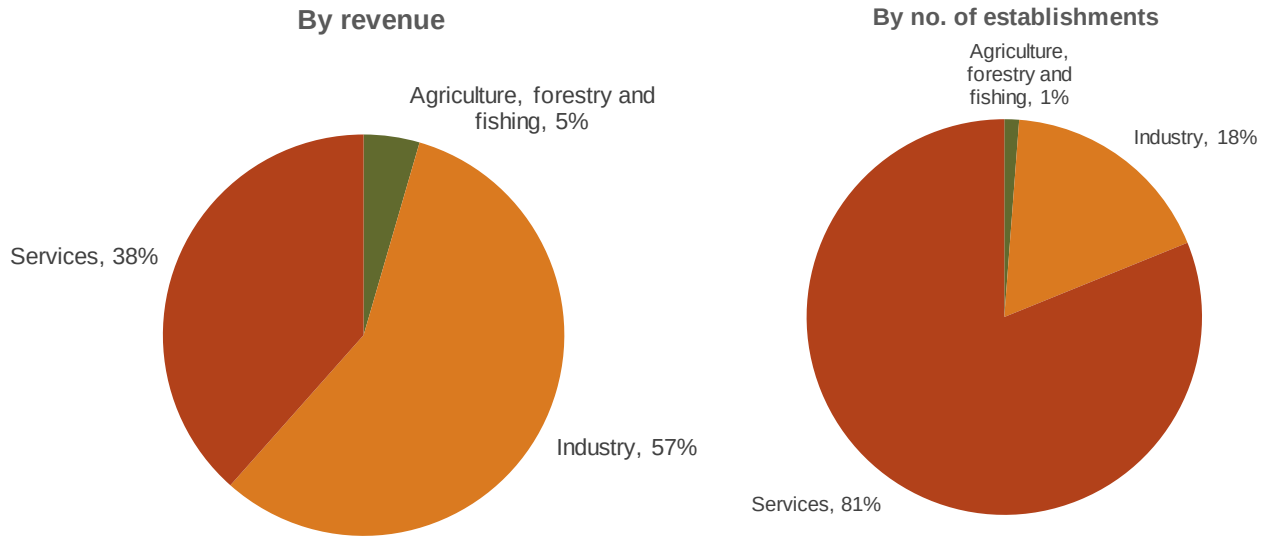
Among manufacturing activities, the manufacture of from textiles, clothing and leather accounts for about 31% of total manufacturing revenues, followed by food and beverages (26%), minerals and metals (16%) and wood and paper (12%). Despite manufacturing's smaller contribution towards overall economic activity (8%), these activities have strong backward and forward linkages to mining activities, as a source of inputs as well as further processing.

5.1.3 Western Region

The Western region is host to Ghana's oil and gas reserves including the Cape Three Points where crude oil was first discovered in commercial quantities in the country in 2007.[13] The region also has several small and large-scale gold mines. The Western region occupies a total land area of 23,921 km^2 with a population of about 2.8 million in 2015. Secondi-Takoradi is a twin city and the capital of the region.

The business revenue contribution from the Western region is just over 7% (GH¢33.8 billion) of the national total. Figure 38 illustrates Western Region's primary activities by revenue and number of establishments. While industry contributes the bulk of revenue generated in the region (57%), more than eighty percent of business establishments in the region are in the service sector. The importance of industry in generating revenues in the region is due to the scale of the mining and oil and gas industries in the areas. As a region, Ashanti is the most diversified in terms of revenue sources amongst the three focus regions.

Figure 38: Distribution of Western Region' activity by revenue and number of activities

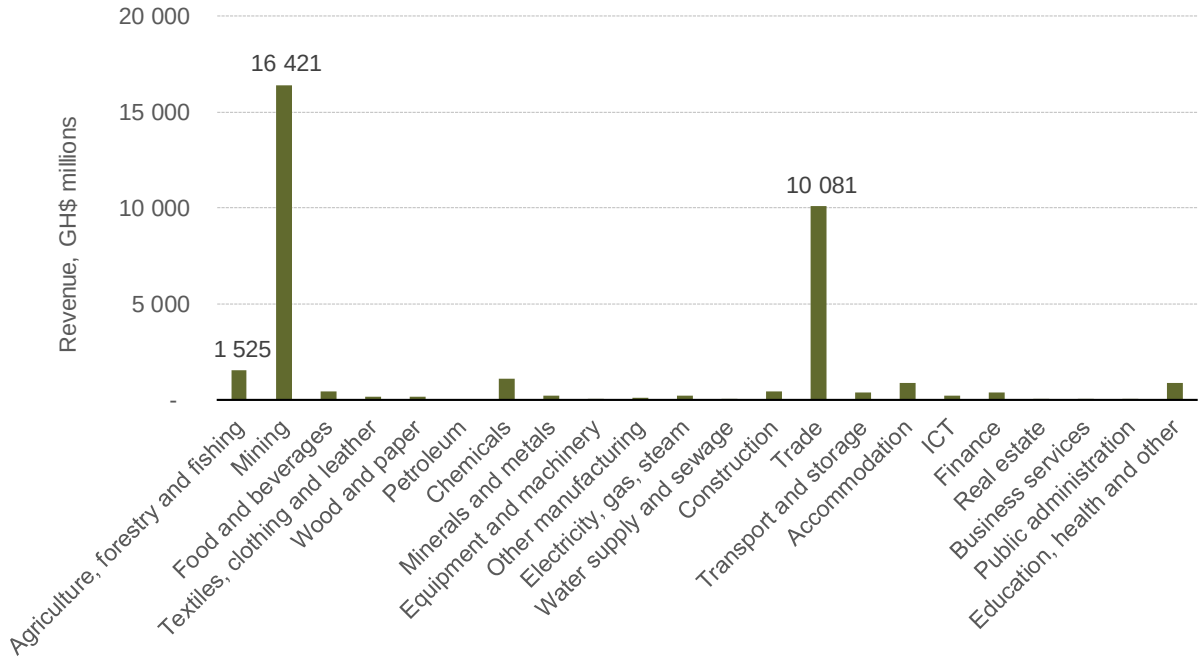


Source: (Ghana Statistical Service, 2017; Ghana Statistical Service, June, 2018)

[13] Mining and quarrying include the extraction of crude petroleum and natural gas. The fiscal regime of Ghana's petroleum sector stipulates that all companies with a license to explore/produce oil in the country are to pay a royalty rate of 10%. Royalties realised from oil exploration are paid into the consolidated account with allocations for various sectors of the economy including the communities where the oil is being exploited.

Mining activity dominates regional economic activity, given that the region houses several small and large-scale gold mines. This is followed by wholesale, retail and trade, which recorded about GH₵ 10,081 million revenues in 2013. Agriculture, forestry and fishing activities posts the third largest business returns in the Western region while the manufacture of rubber and plastic products recorded the fourth largest business returns in the Western region with revenues amounting to GH₵ 1,076 million in 2013.

Figure 39: Western Region sectoral distribution by revenue, total revenue = GH₵33.8 billion



Source: (Ghana Statistical Service, June, 2018)

Within the manufacturing sector, the manufacturing sector chemical sector (which includes pharmaceuticals and rubber products) accounts for roughly half of manufacturing activity in the region (49%). Other significant local manufacturing activities include food and beverages (20%) and minerals and metals (10%). The manufacture of textiles and clothing, and wood products (except furniture) each contribute less than 10%. There is little manufacturing of refined petroleum products, machinery and equipment, electrical equipment and vehicles.

5.2 Social indicators

5.2.1 Skills availability

Educational attainment is shown as a proxy for skills availability, cognisant of the fact that acquiring skills is not limited to formal education. Based on this metric, about 63.2% of Ghana's population has at least an MSLC/BECE (which is equivalent to primary school education), with 14% having secondary or higher education. 4% do not have any form of educational attainment. At a regional level, however, educational attainment trends diverge significantly. (see Table 3).

In the Greater Accra region, over two-thirds of adults have a basic educational certificate or higher educational qualifications with only 2% of the adults in the region having no educational attainment - the lowest figure amongst Ghanaian regions. About one-quarter of adults in the Greater Accra region possess a secondary educational qualification or higher; which compares favourably to the national average rate of 14.3%. Thus, the Greater Accra region (with Accra as its capital) is relatively well endowed with human capital compared to the rest of Ghana.

Table 3: Educational attainment of population aged 15 years and older, by region (%) (2013)

Region	None	Less than MSLC/BECE	MSLC/BECE	Secondary/ Higher	Total
Western	5.7	34.6	46.4	13.4	100
Central	2.4	46.5	46.0	5.3	100
Greater Accra	2.2	28.1	45.3	24.5	100
Volta	3.2	34.4	48.7	13.8	100
Eastern	4.7	40.1	49.4	5.9	100
Ashanti	4.2	32.6	48.7	14.6	100
Brong Ahafo	2.7	45.3	41.0	11.1	100
Northern	4.8	48.8	21.6	24.9	100
Upper East	13.6	27.8	29.8	28.8	100
Upper West	11.3	63.7	12.5	12.5	100
Ghana	4.1	36.8	44.9	14.3	100

Source: (Ghana Statistical Service, June, 2018)

Regarding the Ashanti region, 63% of adults have attained a basic education certificate or higher while less than 5% of adults do not have any educational qualification (Table 11). Close to 15% of adults in the Ashanti region possess a secondary educational qualification or higher; this is similar to the national average.

60% of adults in the Western region have attained a basic educational qualification or higher. The Western region, however, underperforms Greater Accra, Ashanti and the national average in terms of adults without an educational qualification (5.7%) and adults with a secondary educational qualification or higher (13.4%).

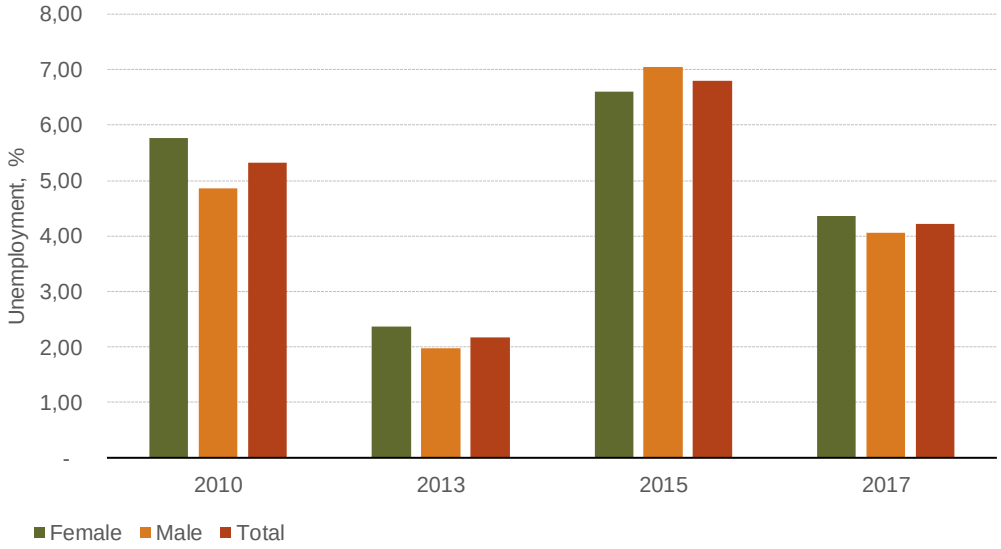
From a skills perspective, in general Greater Accra seems better endowed than Ghana in general, Ashanti is about on par, and the Western region underperforms. Educational attainment is however an imperfect proxy for skills, and it does not speak to the pool of relevant skills available. Given the prevalence of mining and oil and gas activities in the Western region, for example, it is difficult to believe that there is a smaller pool of skilled workers than in the Ashanti region where trade dominates economic activity.

5.2.2 Unemployment

The issue of unemployment, especially, among skilled labour has become a topical issue in Ghana. Recent estimates suggest that the Ghana's unemployment rate is around 4.2% with the incidence

of unemployment being higher among females than among males (see Figure 40). This is an improvement from the 6.8% unemployment recorded in 2015.

Figure 40: Unemployment rate in Ghana, 2010 – 2017



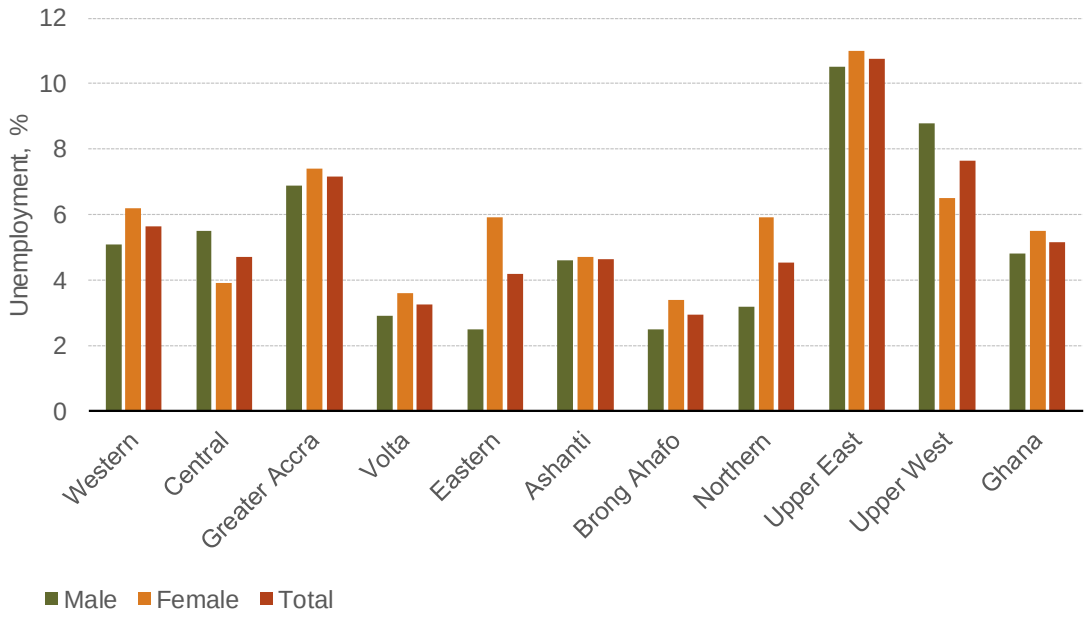
Source: (World Bank, 2019)

At a regional level, unemployment levels are more skewed (Figure 41). The Greater Accra region is one of the regions with the highest incidence of unemployment in Ghana. Available evidence shows that the incidence of unemployment in the Greater Accra region is about 7.2%. Given the dominant role of Greater Accra within the Ghanaian economy, it is likely that a significant proportion of local unemployment will be as a result of economic migrants looking for employment opportunities.

The incidence of unemployment in the Ashanti region is much lower at 4.6%, which is also lower than the national average (Figure 41). Moreover, the unemployment incidence by gender is equally distributed.

In the Western region, the incidence of unemployment is about 5.6%; this is slightly higher than the national average rate of 5.2%. The port city of Secondi-Takoradi, with its relatively high specialisation in manufacturing (which generates about 18% of local employment) recorded the highest manufacturing employment growth in 2017 of 4.2% (World Bank, 2015).

Figure 41: Unemployment rate in Ghana, by region and gender



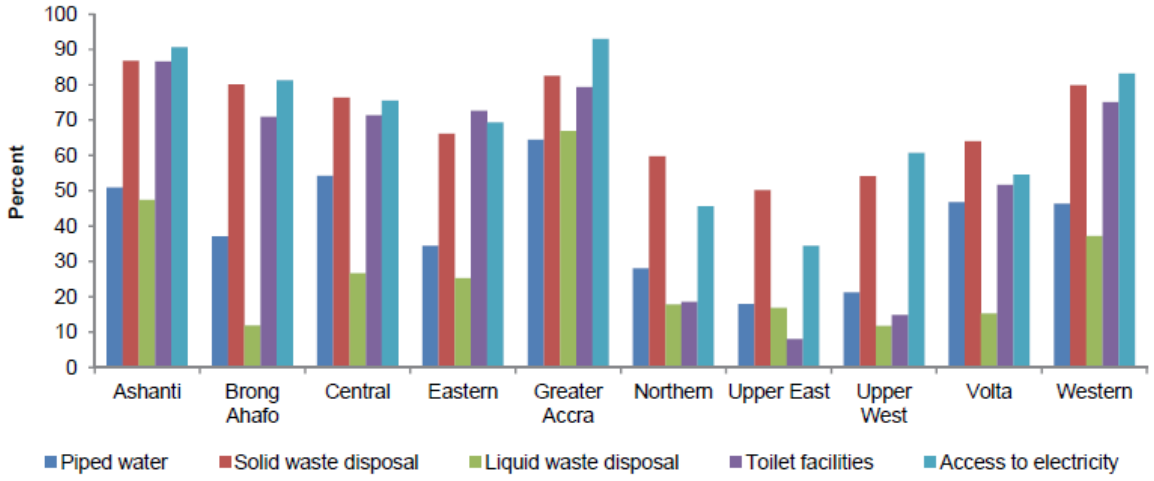
Source: (Ghana Statistical Service, 2014)

5.2.3 Access to basic amenities

Figure 42 shows the presence of a significant levels of inequalities in access to basic services (piped water, solid waste disposal, liquid waste disposal, toilet facilities and access to electricity) across regions in Ghana. What is evident across the regions is that access to electricity is relatively better than access to liquid waste disposal and toilet facilities.

At a regional level, access to pipe water, electricity, and solid waste disposal facilities is disproportionately higher in the South relative their levels in the North. The Greater Accra region records the highest access to electricity in Ghana with more 9 out of 10 households having access to electricity. The Ashanti and Western regions registered the next largest access to basic services (including pipe water, solid waste disposal, liquid waste disposal, toilet facilities and electricity), respectively (see Figure 42).

Figure 42: Access to basic services, by region (%)



Source: (World Bank, 2015)

Another important consequence of the rising level of urbanisation in Ghana has been the growing proportion of urban residents without access to safe toilet facilities. The World Bank (2015) observed that the cities of Accra, Kumasi and Secondi-Takoradi recorded a decline in the proportion of households without any toilet facility with Secondi-Takoradi, for instance, posting about 1.5 percentage points drop in households' access to toilet facilities between 2000 and 2010. Other metropolitan cities such as Tamale and Tema registered significant declines of 8.0 percentage points and 7.3 percentage points, respectively, between 2000 and 2010 (World Bank, 2015).

Further, Ghana has made little progress in terms of the adoption of improved solid waste disposal mechanisms. According to the World Bank (2015), close to two-fifth of households in Ghana dispose their solid waste in open spaces at public dump sites while less than 15% of Ghanaian household use the services of private/public waste collectors. While the use of public dump sites to dispose of household solid waste has declined in the Greater Accra and Ashanti regions – the use of public waste dumping has increased, broadly, in other regions between 2000 and 2010. The use of public dump sites to dispose of household solid waste dropped by 17.3 and 1.5 percentage points in the Greater Accra region and Ashanti region, respectively, between 2000 and 2010. The Upper East, Upper West, and Northern regions registered an increased utilisation of the public dumps to dispose of household solid waste by 25.9, 28.4, and 23.2 percentage points, respectively, over the period 2000 to 2010.

6 INDUSTRIAL DEVELOPMENT PATHWAYS

6.1 Overview and modelling approach

The discussion in Section 2 highlighted the important role urbanisation could play in stimulating economic development in Ghana. Focussing on getting urbanisation right, however, is only likely to generate significant benefits in the longer term. Given Ghana's pressing development needs, it is important to consider whether focusing on the long-term development of productive cities is likely to incur a growth penalty in the short term. If no penalty is incurred, it significantly simplifies policymaking in that activities to stimulate orderly and productive urbanisation can be including in the policy mix immediately without fear that Ghana's short-term development objectives will be compromised.

This section will consider whether there is a trade-off between short-term developmental objectives and a longer-term focus on creating compacted, connected and clean cities by comparing the macroeconomic impacts of the two industrial development pathways.

- The first industrial development pathway, referred to as the **Standard Industrial Policy pathway**, will follow a conventional industrial policy approach and will be comprised of funding allocated under the 10 Point Industrial Transformation Agenda.
- The second industrial development pathway, referred to as the **Cities Matter pathway**, constitutes Interventions aimed at creating compacted, connected and clean cities. It is designed around meeting demand for goods and services by growing urban populations through local manufacturing and service provision over the next 7 years.

An economic multiplier model, developed based on a social accounting matrix (SAM) for Ghana, will be used to compare the expected impacts of the two pathways. SAM models use the existing relationships between sectors and economic agents within an economy to model how an intervention in one sector reverberates throughout the economy. A short explanation of impact analysis using SAMs, and the structure of the Ghanaian economy based on the SAM being used, is provided in Appendix 2.

It is important to note that the modelling investigates a new approach to industrial policy in Ghana, rather than trying to motivate for specific interventions. Activities that are not currently operating at scale (or at all) in Ghana have been included in the SAM model. This allows the analysis to go beyond the status quo and envisage a radically different approach to industrial policy. It is thus a 'visioning' exercise rather than the more straightforward comparison of different investment alternatives that policymakers are typically familiar with. The new activities have been included in the SAM model as relatively small sectors to not distort the economic linkages between existing sectors. This ensures the model remains anchored in economic reality. This will lead to seemingly unrealistically large growth rates in the new sectors when they are stimulated, but this just reflects the fact that these are nascent activities that are growing from a very low (and in some cases non-existent) base. But this is necessary when trying to model new ways of doing things rather than just changing the way in which the current approach is implemented. This is explained in more detail in the remainder of this section and in Appendix 3.

6.1.1 Sector multipliers

The net impacts of each pathway will be generated using multipliers generated by the SAM. Multipliers show how a change in one sector (as a result of an investment, for example) impact all other areas of the economy. By aggregating the direct impact of the investment in the target sector, and the resulting ripple-effect on other areas of the economy, economic multipliers can be used to calculate the overall economy-wide impact in terms of output, GDP and household income linked to a specific investment. The multipliers are derived using the share of intermediate inputs utilised by each sector during the production process. Multipliers are generated by the model based on existing consumption and production patterns within an economy. These patterns are taken from official statistics and summarised within the SAM (see Appendix 2).

Importantly, multipliers are not assumed, but are generated by the model based on the structure of the economy as reflected in the SAM.[14]

The estimated multipliers[15] for Ghana are summarised in Figure 43, Figure 44, and Figure 45.

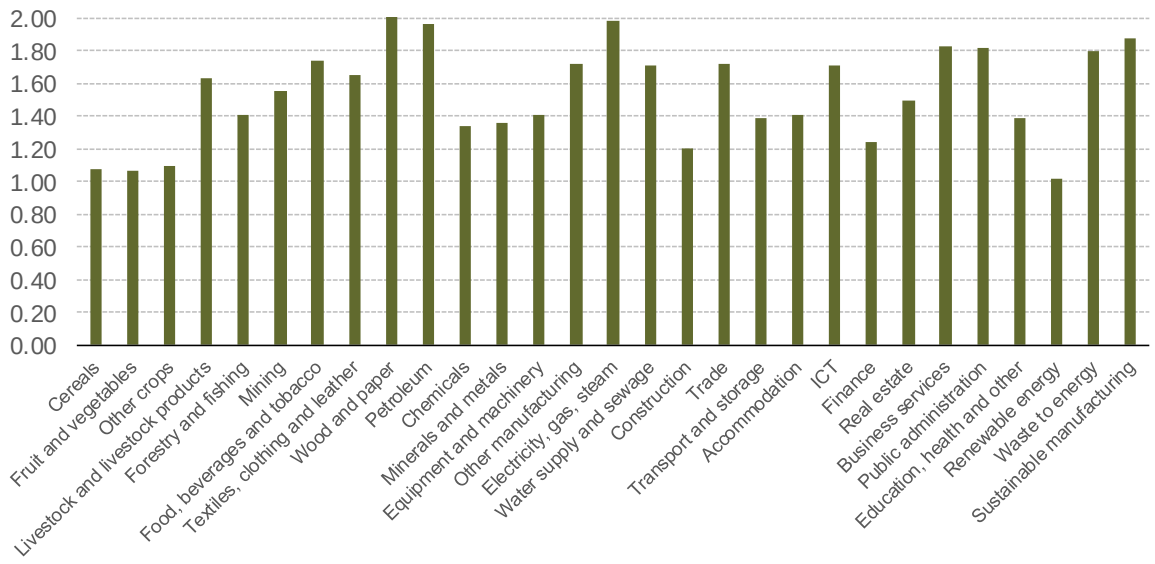
[14] For more on SAM multipliers, see for example, Round, Jeffery I. 2003. Social Round, Jeffery I. 2003. Social Accounting Matrices and SAM Accounting Matrices and SAM-based Multiplier Analysis. Ch. 14 in eds. Fran Multiplier Analysis. Ch. 14 in Bourguignon, F and Pereira da Silva, L (eds), 'The Impact of Pereira da Silva. The Impact of Economic Policies on Poverty and Economic Policies on Poverty and Income Distribution: Evaluation Techniques and Tools'. World Bank and Oxford University Press, Washington, D.C. and New York, pp. 301-324.

[15] The multiplier effect of a GH¢1 increase in output for each sector can be broken down into first round, direct and indirect and economy wide impacts. The first-round impact reflects the direct impact of increasing a sector's output, based on the intermediate inputs that the sector needs to draw in from other sectors in order to increase production. The direct and indirect impact reflects the second-round effects arising from the intermediate input sectors increasing their own demand for inputs, in order to increase supply. The economy-wide or induced impact reflects the third-round effects arising from increases in household income and demand, which induces further increases in production and output.

Whereas the first and second round effects are linked to an intervention (i.e. by considering the impact of changes in the sector that is affect (first-round) and the sectors that directly supplies it (second round effects)), the induced impact also counts the impacts of expenditure on sectors that are not directly affected by an intervention. The economic impact is generated as households and the government spend income that is generate by the intervention in other sectors of the economy (and flow to them in the form of taxes, interest, wages etc) based on their historical expenditure patterns).

For analytical purposes, the analysis of the Standard Industrial Policy and the Cities Matter pathways will focus on the direct and indirect impacts. The analysis also presents results based on a "constrained" assumption. Specifically, we assume that sectors undergoing exogenous shocks do not produce more than the exogenous shock itself. In this way, the multipliers aim to remove the assumption that sectors can produce an infinite supply of a good.

Figure 43: Output multipliers for direct and indirect impacts



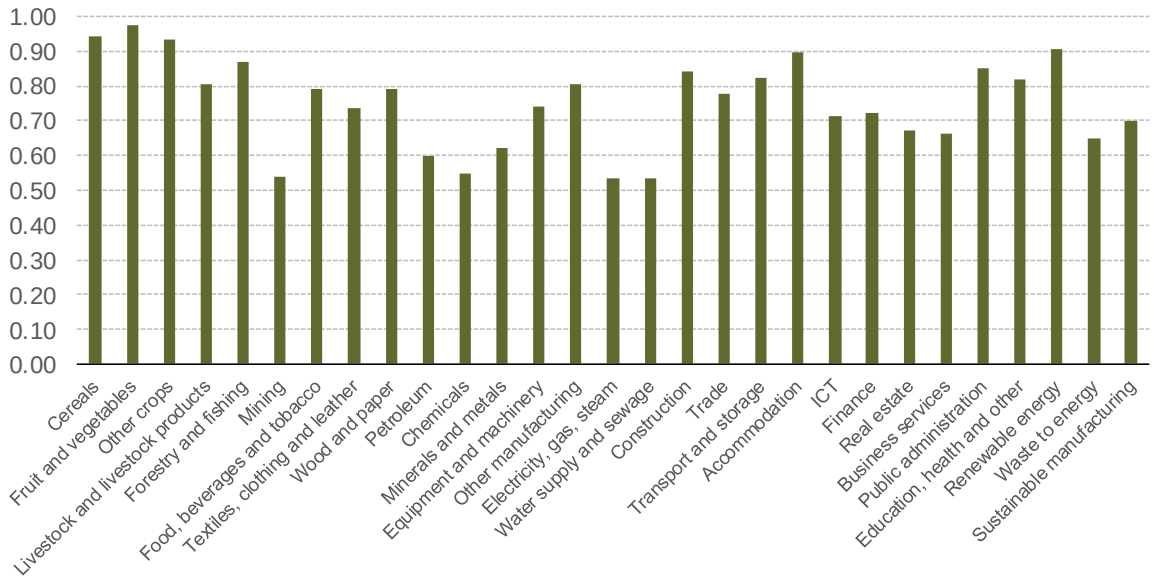
Source: Own calculations based on: Report on the 2015 Social Accounting Matrix (SAM) for Ghana, Ghana Statistical Services. Source data from: Ghana Statistical Services, 2017, "Social Accounting Matrix (SAM) 2015", http://www2.statsghana.gov.gh/nada/index.php/catalog/95.

The values in Figure 43 indicate what the overall impact of an intervention in one sector will be on the wider economy. The overall impact is more than the original intervention because sectors require inputs from other sectors, labour and capital to produce output. Sectors with higher multipliers have stronger linkages to the rest of the economy (i.e. they require more inputs, labour and capital). Investing in these sectors will have a larger impact on the variable for which the multiplier was developed (i.e. output in Figure 43).[16]

In terms of output, the wood and paper, petroleum and electricity, gas and steam sectors have the highest multiplier effects, highlighting that any exogenous changes in output from these sectors would have the largest (per unit) output impact on the economy. A GH¢1 (nominal) unit increase in output in these sectors is likely to result in a direct and indirect multiplier output increase of close to GH¢2 for the entire economy (including the initial GH¢1 unit of output from that sector). Primary agricultural sectors (such as cereals, fruit and vegetables and other crops) and the renewable energy sector have among the lowest output multipliers. A GH¢1 unit increase in output in these sectors results in only a marginal total output increase for the economy as a whole.

[16] See footnote 27 for a discussion of the difference between output and GDP.

Figure 44: GDP multipliers for direct and indirect impacts

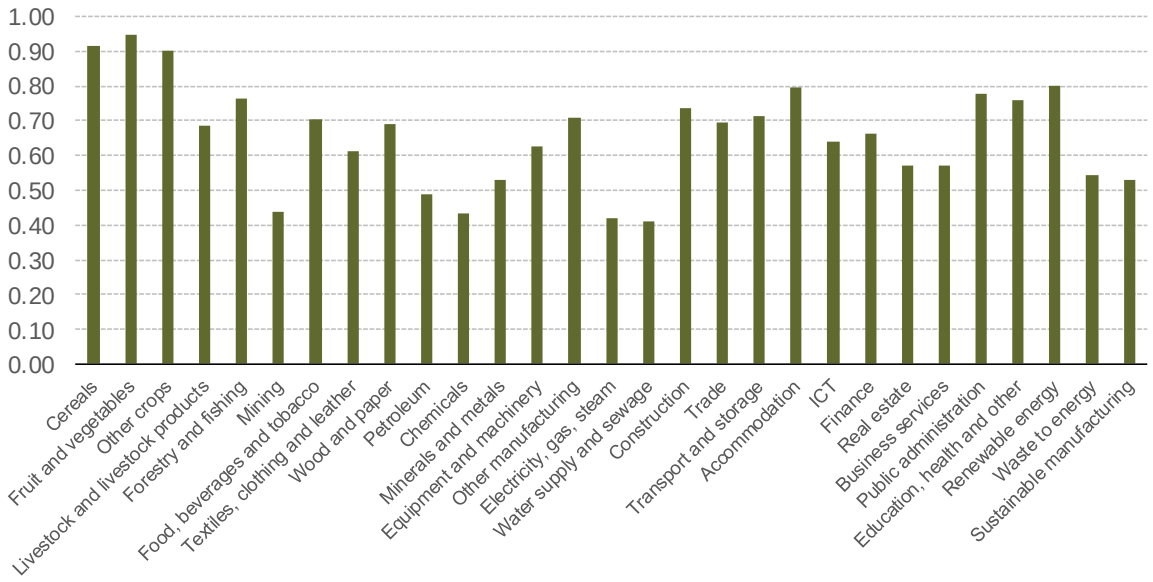


Source: Own calculations based on: Report on the 2015 Social Accounting Matrix (SAM) for Ghana, Ghana Statistical Services. Source data from: Ghana Statistical Services, 2017, "Social Accounting Matrix (SAM) 2015", http://www2.statsghana.gov.gh/nada/index.php/catalog/95.

However, in terms of value-added and GDP, as seen in Figure 44, these primary agriculture sectors have among the highest multiplier effects, primarily because of the share of labour input used for each unit of output. Sectors such as mining, electricity, gas and stream and water supply and sewage have far lower GDP multipliers, with a GH₵1 unit in output from these sectors resulting in GDP increasing by just over GH₵0.50 through direct and indirect multiplier impacts.

Figure 45 shows that the direct and indirect multiplier impacts on household incomes is similar in sectoral variance to that of GDP multipliers, given that a significant proportion of capital and labour payments (which make up GDP) are transferred to households.

Figure 45: Household income multiplier for direct and indirect impacts



Source: Own calculations based on: Report on the 2015 Social Accounting Matrix (SAM) for Ghana, Ghana Statistical Services. Source data from: Ghana Statistical Services, 2017, "Social Accounting Matrix (SAM) 2015", http://www2.statsghana.gov.gh/nada/index.php/catalog/95.

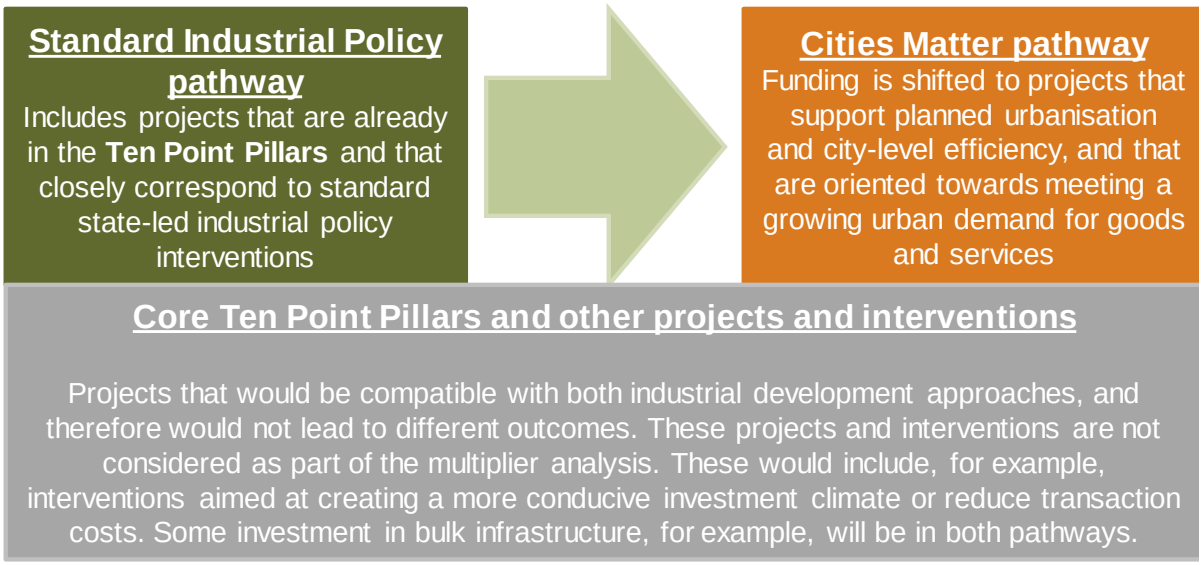
6.1.2 Modelling the pathways

The SAM model will be used as a basis to provide multiplier analysis of two possible industrial pathways. The two pathways have been developed following engagement with a range of stakeholders during the consultative phase of this study.

Ghana's industrial development policies, together with information from discussions from key stakeholders, is used as the basis for developing the scenarios. Specifically, the standard industrial policy pathway is developed using the 1D1F and National Industrial Revitalisation Programme as the basis for determining the planned capital investment and sectoral allocation. A Standard industrial pathway totalling GH₵4.2 billion is modelled, the basis of which is summarised in Section 6.2 below.

The purpose of the analysis is to contrast the impact of two different set of investment choices within the larger context of the Ghana's industrial policy. Given that this is a comparative analysis, interventions that are not included in the modelling of the first pathway can be considered as common to both pathways, i.e. they will not lead to a differential impact between the two pathways. In a sense, these are believed to be projects that would be undertaken irrespective of which development approach is followed. This is summarised visually in Figure 46.

Figure 46: Distinguishing between the Standard and Cities Matter industrial pathway



The first pathway models the impact of a subset of projects or interventions identified through a review of Ghana's current industrial policies and frameworks. The interventions that are modelled in this pathway are "standard" state-led industrial policy interventions. The second industrial pathway will be modelled by reallocating the total spending in the first pathway towards sectors or projects that will support managed urbanisation in Ghana. Planned investments in SEZs, for example, will be diverted to water and waste treatment projects. Large centralised power generation projects, including hydro and coal-fired power plants, could be diverted to decentralised solar PV projects. A summary of the interventions identified for such a "Cities Matter" pathway is provided in Section 6.3.

6.2 Standard Industrial Policy pathway

At the time of writing this paper, the detailed action plan including the expected investment for the 10 Point Industrial Transformation Agenda (which outlines Ghana's current industrial policy approach - see Appendix 1), was not yet publicly available. Consequently, engagements with key state agencies, notably the 1D1F secretariat through the Ministry of Trade and Industry, pronouncements by government and budget statements were used to gain an understanding of what the investment will look like. Given data limitations, the Standard Industrial Policy pathway is based on the investments for the two main pillars of the 10 Point Agenda only i.e. the National Industrial Revitalization Programme and the One District One Factory (1D1F) (see Section A 1.4. in Appendix 1).

Under the 1D1F and the National Industrial Revitalization Programme, the government's financial support to beneficiary firms is largely through the provision of interest rate subsidies and project facilitation support. Companies that access credit from participating financial institutions will receive an interest rate subsidy of 50% of the lending rate, where the lending rate is capped at 20% per annum. Separately, eligible companies can also apply for tax holidays and exemptions on import duties on the importation of plant and machinery. A summary of the non-governmental financing

sources for projects under the 1D1F programme is as follows (Ministry of Trade and Industry (MOTI), 2017):

- Promoter's equity
- Private financial institutions
- Local private equity companies
- China-AGI $2 billion financing scheme
- Indian Exim Bank credit facility

Together, the fiscal projections for 1D1F (GH¢ 508 million supporting 79 projects) and the Stimulus Package Programme (GH¢ 95 million supporting 80 companies) (shown in Appendix 4), provide us with the estimated total funding of GH¢ 603 million supporting 159 projects. Combining the funding from the two programmes provides the sectoral split shown in Table 4. As expected, based on the individual allocations, the funding is targeted largely at the agro-processing and chemicals and pharmaceuticals industries. The funding is scaled by a factor of 7 to provide an indication of the total expected funding over the seven years of the 10 Point Industrial Transformation Agenda.

Table 4: Summary of total fiscal spending on 1D1F and Stimulus package programmes (by sector)

Sector	Number of Projects	Budgetary allocation ('million GHC), 2018	Programme lifetime allocation: 2018 - 2024 ('million GHC)	Percentage of allocation
Livestock	7	45.01	315.09	7%
Agro-processing	82	275.63	1929.43	46%
Garment and Textiles	5	5.94	41.56	1%
Chemicals and Pharmaceuticals	47	249.80	1748.59	41%
Plastics and Packaging	6	7.13	49.88	1%
Electrical and Electronics	3	3.56	24.94	1%
Other manufacturing	1	6.43	45.01	1%
Building Materials	6	7.13	49.88	1%
Services	2	2.38	16.63	0%
Total	**159**	**603.00**	**4221.00**	**100%**

Source: Own calculations based on information in Appendix 1 and Appendix 4

For the Standard Industrial Policy pathway, the sectoral link between the project and SAM is relatively straight forward. The fiscal spending in Table 4 is translated into the funding allocations to model as the Standard Industrial Policy pathway in Table 5.

Table 5: Funding allocation in the Standard Industrial Policy pathway, GH₵ million

Type of Project	Capital investment	SAM model sector allocation
Livestock	315	Livestock and livestock products
Agro-processing	1,929	Food, beverages and tobacco
Garment and Textiles	42	Textiles, clothing and leather
Chemicals and Pharmaceuticals	1,749	Chemicals
Plastics and Packaging	50	Chemicals
Electrical and Electronics	25	Equipment and machinery
Other manufacturing	45	Other manufacturing
Building Materials	50	Other manufacturing
Services	17	Equal distribution across services sectors (Trade, Transport and storage, Accommodation, ICT, Finance, Real estate, Business services)
Total	**4,221**	

It was assumed that all the interventions in the Standard Industrial Policy pathway would be successful and would generated ongoing economic activity (see Appendix 3 and Appendix 4) for a description of how investment was translated into annual output). Most stakeholders felt that it is unlikely that more than 70% of these projects would generate sustainable businesses. Therefore, the results of the modelling for the Standard Industrial Policy pathway investments shown in 6.4 is likely an overestimate of the true economic impact of these investments.

6.3 Cities Matter pathway

A proposed Cities Matter pathway was developed by reallocating the expenditure from the Standard Industrial Policy pathway based on in input from local consultants and considering government policy priorities and the newly released Ghana Infrastructure Plan (National Development Planning Commission, 2019). The proposed Cities Matter pathway is shown in Table 6.

Table 6: Proposed Cities Matter pathway

Type of Project	Source	Distribution	Total expenditure (million GH₵)
Renewable Energy (PV)	Infrastructure Plan/New sector	20%	844
Integrated Waste Management	Infrastructure Plan	15%	633
Solid Waste Management	Infrastructure Plan	15%	633
Waste recycling	Government priority (plastic)	5%	211
Drainage, Flood control and Coastal protection	Infrastructure Plan	20%	844
Biogas to electricity	Local information	15%	633
Alternative local manufacturing	Local information	10%	422
Total		**100%**	**4,221**

Feedback from stakeholders and participants of the Ghana Urbanisation Think Tank on the 4th of September 2019 was that the proposed Cities Matter pathway largely captured interventions that

were happening anyway.[17] While there may be merit in considering the impact of increasing these types of intervention, stakeholders did not feel the proposed mix of interventions would lead to a meaningful change in the way Ghana's urban areas developed. While there was general support for the proposed renewable energy, waste recycling and local manufacturing investments proposed, stakeholders felt it was important to also invest in transport infrastructure, low cost housing and support for informal and small-scale businesses operating in cities.

Support for small-scale and informal business, in particular, was emphasised. Stakeholders felt strongly that, given the reality of urban economies in Ghana, it would be very difficult to change the development trajectories of cities without increasing the efficiency of small-scale and informal businesses. This view was supported by the results of the 2014 Integrated Business Survey (GSS, 2015) which found that 90.5% of the businesses in Ghana are informal.[18] In the industrial sector the proportion is slightly higher at 91.6%. Even in Greater Accra, the most urbanised region in Ghana, only 16.7% of businesses are considered formal.

Stakeholders believed that urbanisation would only become a strong driver for industrial development if the local construction industry started to use more locally produced inputs. This aligned well with the new 'sustainable manufacturing' sector that was included in the SAM for the analysis as this sector is a combination of sustainable building materials, water tanks and bamboo bicycles. This sector can thus be seen as a proxy for a supplier of local inputs to the transport and housing industries.[19]

It was also suggested that urban agriculture be included in the Cities Matter pathway, although not all stakeholders felt equally strong about the importance of this. The issue of implementation and monitoring capacity at local level was raised as a barrier to effective urbanisation by stakeholders. Two stakeholders believed that technology could help to overcome this barrier, particularly in terms of monitoring the delivery of services and adherence to zoning and urban planning regulations.

Based on this feedback a Cities Matter pathway was developed that included a significant funding allocation to the sustainable local manufacturing sector.[20] Although only 10% of the pathway investment was directed allocated towards projects in this sector, it was assumed that a portion of the funding to low cost housing projects and transport infrastructure projects would also be directed to this sector to increase the local content of these types of projects. In total, 18% of the investment under this pathway was invested in the sustainable local infrastructure sector. Because of the low capital-output ratio in this sector, and its strong linkages to other sectors, output in this sector

[17] See Appendix 6 for a discussion of the stakeholder engagement process.

[18] Defined as an establishment that does not have professionals keeping accounting records.

[19] The way low cost housing and transport infrastructure was modelled is different from the general explanation provided in Appendix 3. Rather than using capital-output ratios to estimate the level of output from the relevant sector, it was used to model output from the main input sectors. It is therefore closer to modelling the initial 'investment' or 'construction' impact of an intervention than modelling its resulting output – as was done for other interventions. The reason for this is that these investments are seen as ongoing investment programmes. It is therefore envisaged that investment in low-cost housing and transport infrastructure will continue for the foreseeable future.

[20] See Appendix 3 for details of how this sector was constructed.

increased exponentially (although of a low base)[21] as a result of this investment, and this increase contributed almost a quarter of the total output growth in the economy under this pathway[22]. Reviewer comments emphasised how risky it would be to base policy analysis on a comparison where results under one of the pathways is influence this strongly by a relatively unproven sector. Because of this the composition of the Cities Matter pathway was adjusted to place less weight on this sector. The final Cities Matter pathway interventions modelled, taking into consideration this rebalancing of investments, is summarised in Table 7 below and the investment summarised by SAM sector is shown in the table that follows.

Table 7: Cities Matter pathway

Type of Project	Distribution	('million GHC)	SAM Sector	Sector split
Small-scale / informal sector support (including commercial zones)	20%	844.2	c-Trade	50%
			c-Business services	20%
			c-Transport and storage	15%
			c-Real estate	15%
Low cost housing	15%	633.2	c-Construction	75%
			c-Sustainable manufacturing	0%
			c-Wood and paper	25%
Transport infrastructure	15%	633.2	c-Construction	75%
			c-Sustainable manufacturing	0%
			c-Other manufacturing	25%
Renewable Energy (PV)	15%	633.2	c-Renewable energy	100%
Biogas to electricity	15%	633.2	c-Waste to energy	100%
Sustainable local manufacturing (including building materials)	1%	42.2	c-Sustainable manufacturing	100%
Urban agriculture	6%	253.3	c-Fruit and vegetables	100%
Technology-based urban management	5%	211.1	c-Business services	50%
			c-ICT	50%
Waste recycling	8%	337.7	c-Water supply and sewage	100%
Total	**100%**	**4,221**		

[21] Because this sector was added to the SAM, it's share of output was set to amount for a small percentage of total output to not distort the economic linkages between existing sectors. Even a small investment in this sector will therefore have a large impact on the increase in output from this sector.

[22] See Appendix 5 for details of this specification of the Cities Matter pathway and the modelling results generated.

Table 8: Funding allocation in the Cities Matter pathway by SAM sector

SAM model Sector	Distribution	('million GHC)
c-Fruit and vegetables	6%	253
c-Wood and paper	4%	158
c-Other manufacturing	4%	158
c-Water supply and sewage	8%	338
c-Construction	23%	950
c-Trade	10%	422
c-Transport and storage	3%	127
c-ICT	3%	106
c-Real estate	3%	127
c-Business services	7%	274
c-Renewable energy	15%	633
c-Waste to energy	15%	633
c-Sustainable manufacturing	1%	42
Total	**100%**	**4221**

6.4 Modelling results

Table 9 shows a summary of the percentage change in output for the two pathways, based on the assumptions noted in previous sections. Overall output under the Cities Matter pathway is 50%larger than that of the Standard Industrial Policy pathway, based on the direct and indirect multipliers and estimated capital-output ratios.[23] For the Cities Matter pathway, there are significant increases (growth of 30% or more) in output in the Fruit and vegetables, Other manufacturing, Construction, and Trade sectors. The three "new" sectors also see significant increases in output, though this is in some ways by design, given that initial output for these sectors was set to be a very small proportion of overall output.[24] The biggest contributors to the increased output are the Construction and Trade sectors.

The Cereals, Livestock and livestock products, Food, beverages and tobacco, Equipment and machinery, and Other manufacturing sectors experience significant growth under the Standard Industrial Policy pathway. While 16 of the 29 sectors included in the SAM model grow more than 1% under this pathway, it is striking that almost 40% of the change in output under the Standard Industrial Policy pathway is accounted for my growth in the agricultural and forestry sectors. The reason for this is that the largest individual portion of investment under this pathway is directed towards the agro-processing sector (46%).[25] While this is a manufacturing sector, it has strong backward linkages to the agricultural sectors. The agro-processing sector (Food, beverages and tobacco) accounts for 45% of the increase in output under this pathway.

The Minerals and metal sector grows significantly faster under the Cities Matter pathway. This is because minerals and metal are important inputs into all the industrial sectors, but its largest user is construction. The faster growth under this pathway this is thus largely driven by the increase in construction. The sustainable local manufacturing sector actually uses less minerals and metals than the standard manufacturing sectors because of a preference for wood and agricultural inputs.

The increased growth in the construction sector under the Cities Matter pathway is only partially driven by direct investment in the housing and transport sectors.[26] The SAM structure reveals that construction material is an important input into most sectors in Ghana, and a significant portion of the increased growth in this sector is thus indirectly driven by demand from other sectors that grow as result of the Cities Matter pathway investment expenditure.

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[23] It is important to note that a SAM model does not provide information on the likelihood that a sector will grow, it only shows what will happen to other sectors if the sector does grow. The capital-output ratios for the Ghanaian economy was used to calculate the growth in sectors based on historical data (i.e. if 1 unit of capital led to 2 units of output in a sector historically, it was assumed that this relationship would hold going forward). The results presented in this sector thus show the expected impact, based on the underlying structure of the Ghanaian economy, if investments made as part of the Standard Industrial Policy pathway or the Cities Matter pathway lead to the amount of output that was typically been associated with investments in these sectors. This section thus does not advocate any specific investments, and before any investments are undertaken, it would be prudent to consider the merits of the individual projects in detail.

[24] This was to ensure that the inclusion of new sectors in the SAM did not materially impact on the structure of existing sectors in the SAM.

[25] 7% of the capital investment under this pathway is also targeted directly at the livestock sector.

[26] 23% of the Cities Matter pathway funding go directly to the construction sector via the transport and housing investments.

Table 9: Percentage change in output for Standard Industrial Policy and Cities Matter pathways (nominal)

	Standard Industrial Policy		Cities Matter	
Commodity sector	**% Change**	**% Contribution to output**	**% Change**	**% Contribution to output**
Cereals	101%	16%	1%	0%
Fruit and vegetables	0%	0%	46%	8%
Other crops	16%	4%	3%	0%
Livestock and livestock products	126%	14%	2%	0%
Forestry and fishing	12%	2%	10%	1%
Mining	1%	1%	2%	2%
Food, beverages and tobacco	140%	45%	1%	0%
Textiles, clothing and leather	16%	1%	3%	0%
Wood and paper	13%	2%	3%	0%
Petroleum	4%	1%	6%	1%
Chemicals	18%	2%	7%	0%
Minerals and metals	3%	0%	29%	2%
Equipment and machinery	320%	1%	5%	0%
Other manufacturing	529%	6%	883%	7%
Electricity, gas, steam	4%	1%	9%	2%
Water supply and sewage	1%	0%	5%	0%
Construction	1%	0%	62%	38%
Trade	0%	0%	57%	25%
Transport and storage	0%	0%	2%	1%
Accommodation	0%	0%	0%	0%
ICT	0%	0%	4%	1%
Finance	0%	0%	12%	2%
Real estate	0%	0%	13%	2%
Business services	0%	0%	16%	4%
Public administration	0%	0%	0%	0%
Education, health and other	3%	2%	0%	0%
Renewable energy*	4%	0%	422%	1%
Waste to energy*	0%	0%	4218%	1%
Sustainable manufacturing*	0%	0%	47248%	2%
	12%	**100%**	**18%**	**100%**

Source: Own calculations based on (GSS, ISSER and IFPRI, 2017).
Source data available at http://www2.statsghana.gov.gh/nada/index.php/catalog/95
** Because these sectors were added to the SAM, and the share of their output was "fixed" to amount for a small percentage of total output, even small investments in these sectors will have a large impact on the increase in output from these sectors.*

Figure 47 shows the aggregate (nominal) change in GDP and value-added for the Standard Industrial Policy and Cities Matter pathways. Similar to the output results, the Cities Matter pathway sees a higher increase in (nominal) GDP relative to the baseline than Standard Industrial Policy pathway. The GDP multiplier impact for the Cities Matter pathway, when measured in market prices, is almost double that of Standard Industrial Policy pathway (11% v 21%), given the same level of investment.[27] A GDP impact differential that is larger than an output impact differential reflects a greater degree of integration (greater use of local inputs) by sectors that grow faster under the Cities Matter pathway.

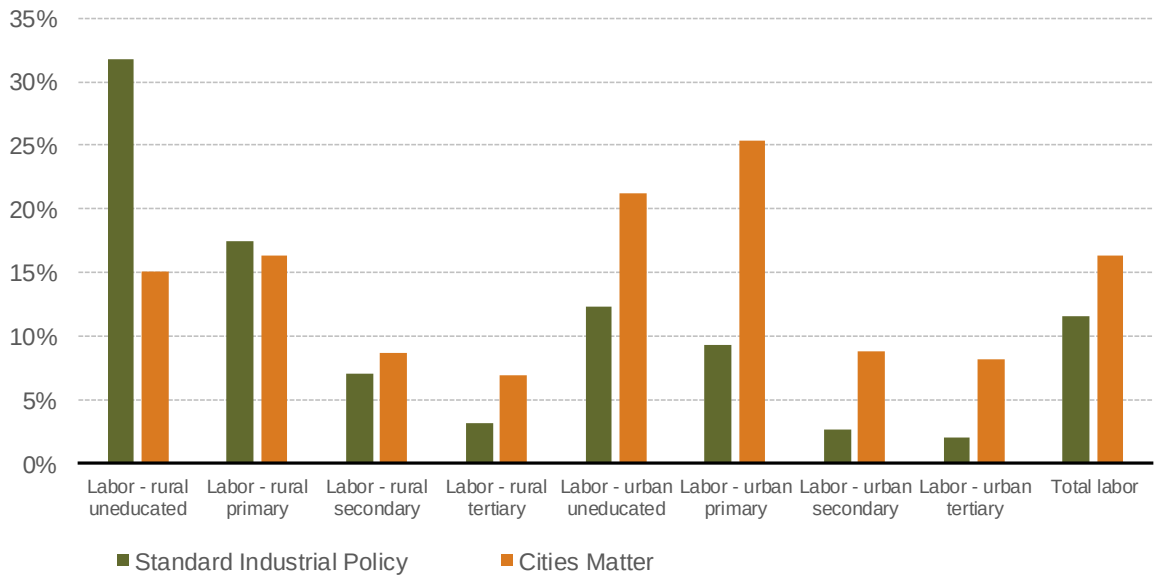
Figure 47: Percentage change in output and GDP for Standard and Cities Matter pathways (nominal)

Source: Own calculations based on (GSS, ISSER and IFPRI, 2017).
Source data available at http://www2.statsghana.gov.gh/nada/index.php/catalog/95

[27] GVA and GDP both measure the value of final goods and services produced within an economy. They are thus measures of incremental output (net of inputs), and not aggregate output. GVA, however, is a subset of GDP, and GDP can be defined as GVA plus taxes and minus subsidies, and as such. In this sense, GDP describes economic activity in an economy from the consumer's perspective, whereas GVA gives the producers perspective. Total output, on the other hand, is a measure of aggregate output including intermediate consumption (inputs). As such, GVA is significantly different from, and will always be less than, total output (Stats SA, 2016; SARB, 2016; Cloete, et al., 2018).

GDP aggregated to the national level is comparable to final sales as it does not duplicate any production, whereas using gross output at the national level would lead to the double-counting of sales between industries. Thus, while gross-output is a reliable measure of output at the sectoral level, GDP is a more reliable indicator of national economic activity (BEA, 2014).

Figure 48: Percentage change in labour income for Standard and Cities Matter pathways (nominal)

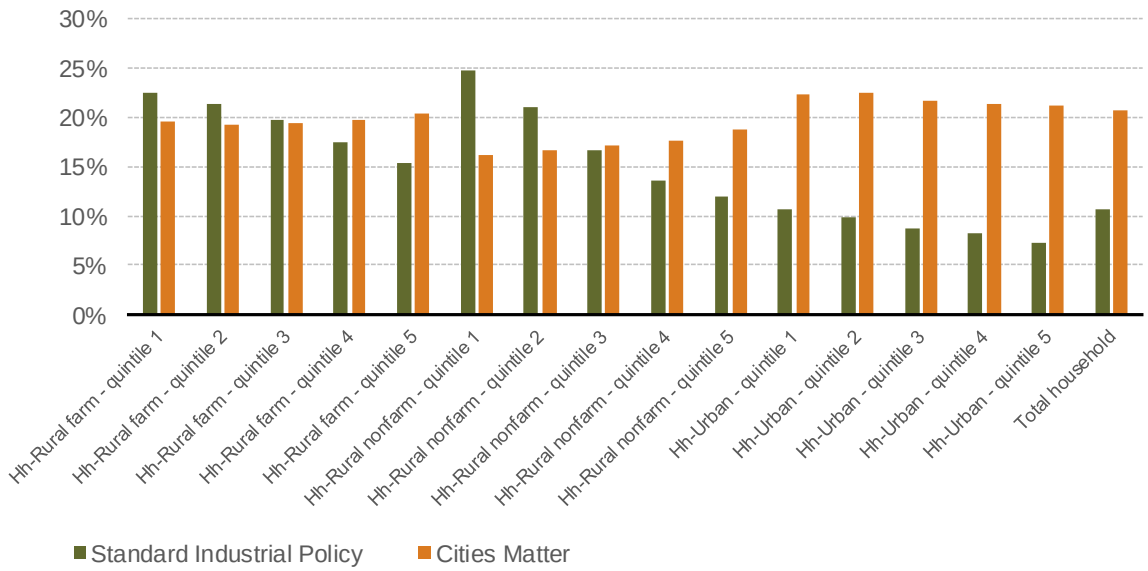


Source: Own calculations based on (GSS, ISSER and IFPRI, 2017).
Source data available at http://www2.statsghana.gov.gh/nada/index.php/catalog/95

Figure 48 shows that the overall labour income multiplier effect is also higher for the Cities Matter pathway than under the Standard Industrial Policy pathway. However, because the output multiplier effect is larger for the primary agriculture and agro-processing sectors under the Standard Industrial Policy pathway, rural workers with little or no education receive higher this pathway. Conversely, the labour impacts for the Cities Matter pathway are significantly higher among urban labour groups. Labour impacts are also higher for the Cities Matter pathway for a number of rural labour groups, primarily due to the second round multiplier effect from the sustainable manufacturing and other manufacturing sectors, which sees increased demand for other crop intermediate inputs, and strong growth in the fruit and vegetables sector.

While the impact on household incomes is ambiguous for rural households, with lower income quintile rural households being better off under the Standard Industrial Policy pathway and higher income quintile rural households under the Cities Matter pathway, all urban households receive significantly higher income under the Cities Matter pathway than under the Standard Industrial Policy pathway.

Figure 49: Percentage change in household income for Standard and Cities Matter pathways (nominal)



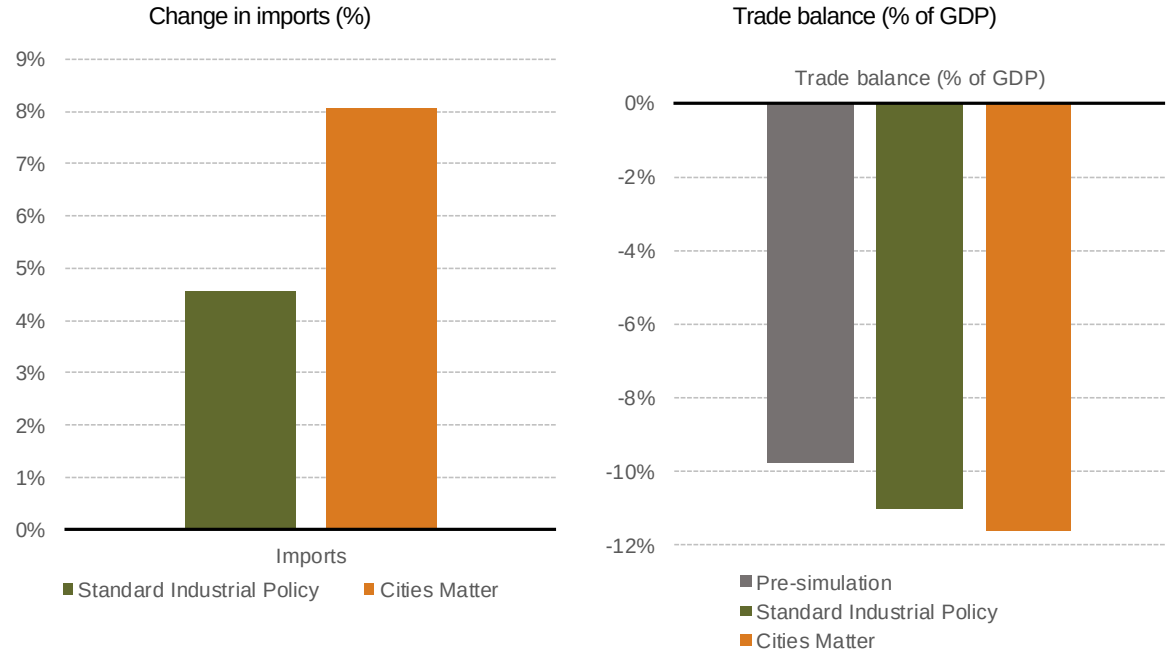
Source: Own calculations based on (GSS, ISSER and IFPRI, 2017).
Source data available at http://www2.statsghana.gov.gh/nada/index.php/catalog/95

Figure 50 shows the aggregate (nominal) change in imports for the Standard and Cities Matter pathways, and the overall change in the trade balance for Ghana. Given that exports are treated as an exogenous variable[28], the multiplier analysis also simply assumes that the proportion of exports for all additional output generated by the multiplier impacts remains the same as the initial proportion of exports.

The Cities Matter pathway leads to a slightly higher current account deficit, but this is marginal (12% vs 11%). And the current account deficit in both pathways are close to the baseline value of 10%. In reality, the current account is likely to be less of an issue since Ghana's trade balance has improved since the SAM base year of 2015.

[28] Because the SAM multiplier analysis is based on assumed changes in, or shocks to, output demand, this requires that certain demand variables remain exogenous in the SAM modelling. Typically, government demand and exports are treated as exogenous variables to assess the impact of output demand shocks. As noted by Round (2003), this is typically done for export demand because "*the external sector is outside domestic control*". Given that exports are treated as exogenous to the model, the SAM multiplier analysis does not determine multipliers for export demand based on shocks to aggregate output demand.

Figure 50: Percentage change in imports and the overall trade balance (nominal) under different pathways



Source: Own calculations based on (GSS, ISSER and IFPRI, 2017).
Source data available at http://www2.statsghana.gov.gh/nada/index.php/catalog/95

6.5 Implications for focus cities

A SAM models provides sectoral growth at a national level, along with social implications of any changes in investments across the economy. Even though the SAM does not have a geographical dimension, and is unable to predict impact at a city or regional-level, under different pathways, considering the sectors that will grow at the national-level can provide some useful insights.

In terms of industrial sectors for example, economic activity will follow stimulus, especially in the save of the renewable energy sector, where the sector modelled is distributed generation i.e. solar PV and biogas-to-electricity. While there may be imports of components (e.g. solar panels) centrally, installation and maintenance (where a lot of the additional value added for distributed generation projects are located) will follow the location of projects. The same is true for water supply and sewerage projects. Given that these are the sectors that expand the most under the Cities Matter pathway (see Section 6.4), economic activity under this pathway can thus be relatively dispersed if projects are spread out across regions. Under the Standard Industrial Policy, the growth of the sectors is less likely to be dispersed given that the sectors positioned to grow (Other manufacturing and Electricity, gas and steam) are location specific.

Under both pathways, however, there is strong growth in service sectors, although the distribution of the sectors differs somewhat. The service sectors are likely to be more dispersed than the industrial sectors and will most likely be provided in the regions where the stimulus is targeted.

The growth in economic sectors under the different pathways can also be compared to the economic weight of the relevant sectors in the focus cities. Unfortunately, GDP per sector at the city-level is not available for Ghana's cities. Information on revenue generated in different sectors is available, at a regional level from the Integrated Business Establishment Survey Phase II - Comprehensive Sectoral Report for the 2013 reference period (Ghana Statistical Service, June, 2018). While this is not a perfect proxy for city-level economic activity, it is meaningful given that Ghana's economic activity is centralised in the regional capital cities.

The revenue by economic sector provides an indication of the type of economic activities that are present within a city. While there is a need in African cities to greatly enhance investment in infrastructure, residential and business property, and spaces with the requisite support services to support both local innovation and the localisation of international technology, Grant (2015) believes that urbanisation and development planning should not ignore the economic activities that are already present in cities. Small-scale and even informal activities can act as sources of innovation, and when combined with international technologies and practices, could help address both development and inequality.

To consider the extent to which the sectors that grow at the national scale can support local development, information from the SAM analysis and the Integrated Business Establishment Survey Phase II were aligned and aggregated to the lowest level of aggregation present in all sources. Below the sectoral growth outcomes generated under the two industrialisation pathways is layered on the sectoral composition of economic activity in the three focus cities i.e. Accra (Greater Accra), Kumasi (Ashanti) and Secondi-Takoradi (Western).

6.5.1 Accra

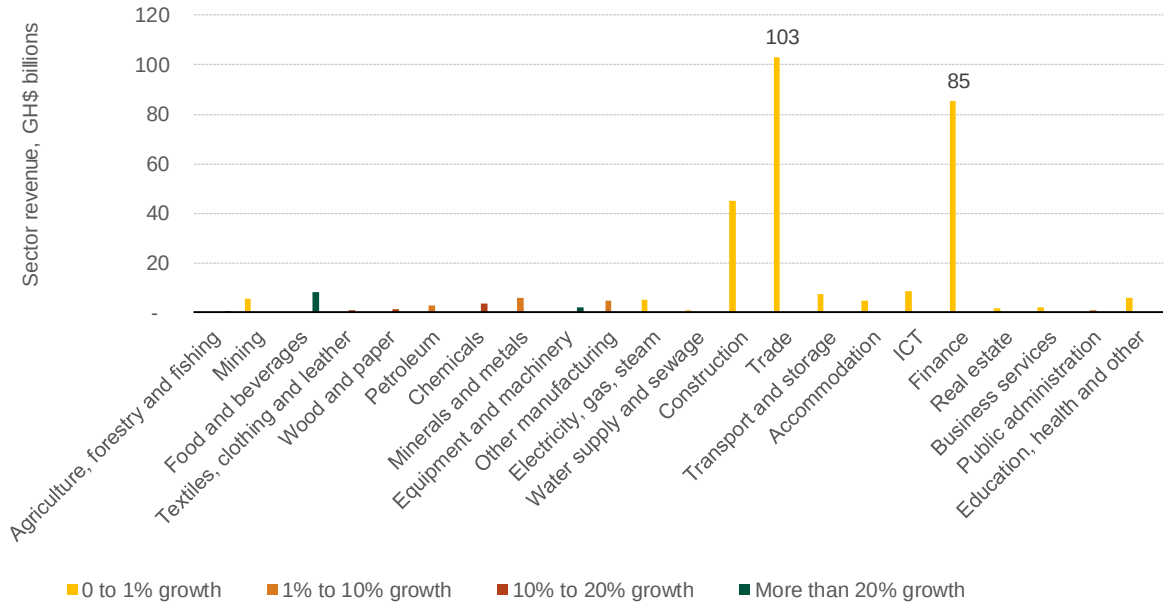
Figure 51 and Figure 52 map the SAM for Accra's Standard Industrial Policy Pathway and the Cities Matter Pathway. Under the Standard Industrial Policy pathway, only one of the five biggest sectors (Food and beverages) in Accra experiences transformative growth of more than 20%.[29] The largest sectors (Trade, Construction, Finance and ICT) barely grow (less than 1%). Chemicals and Wood and paper, relatively significant sectors experience growth ranging between 10% and 20%, while the smaller sectors (Equipment and machinery, and Agriculture and forestry) experience growth of over 20%.

Under the Cities Matter pathway, the largest sectors (Trade, Finance, Construction and ICT) are predicted to grow faster. Under this scenario, the largest sector i.e. Trade, which generates the most business revenue in the region and therefore also probably in the city, is expected to experience moderate growth between 1% and 10%, while the second largest, Finance will experience 10% to 20% growth. The third largest sector, Construction, will experience transformative growth, predicted

[29] Please note that because a SAM model does not have a time dimension, this denotes the total expected growth in the sector as a result of the interventions over a number of years. This is not an annual growth rate.

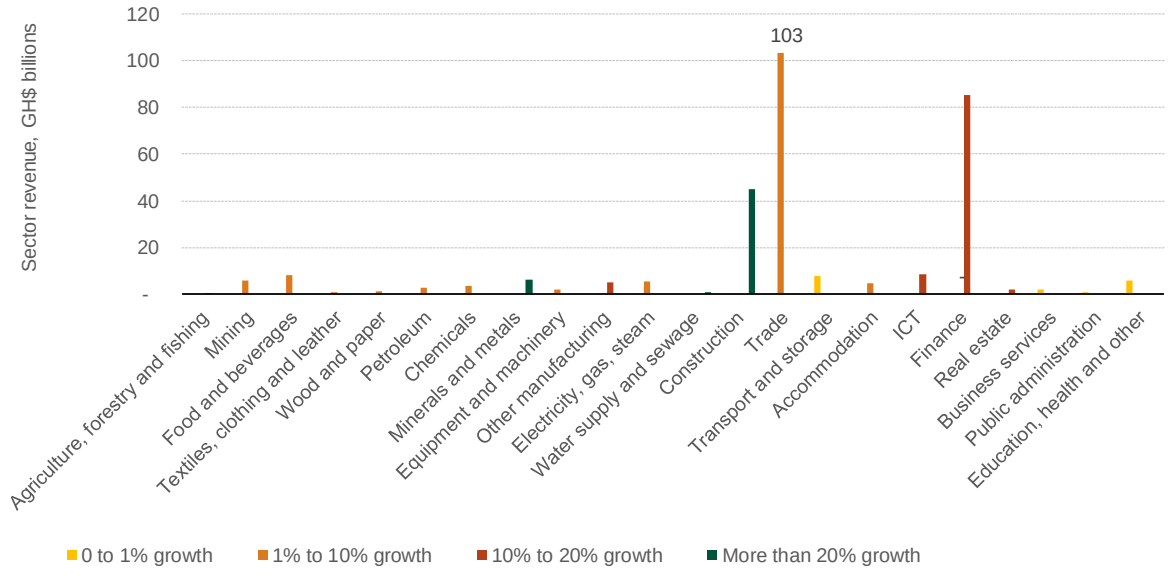
to grow by more than 20%. The growth in the performance of the smaller sectors (Textiles, clothing and leather, Chemicals and Wood and paper) are similar to the Standard Industrial Policy pathway.

Figure 51: Implications of Standard Industrial Policy pathway for Accra



Source: Own calculations (ibid); IBES II (2018)

Figure 52: Implications of Cities Matter Pathway for Accra

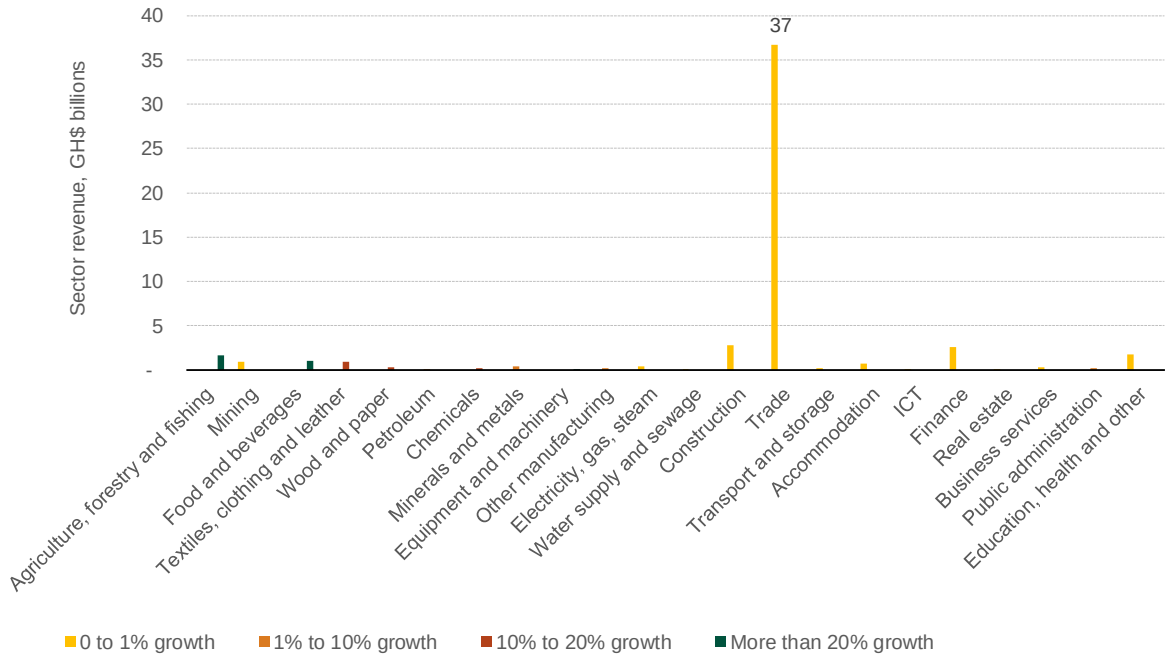


Source: Own calculations (ibid); IBES II (2018)

6.5.2 Kumasi

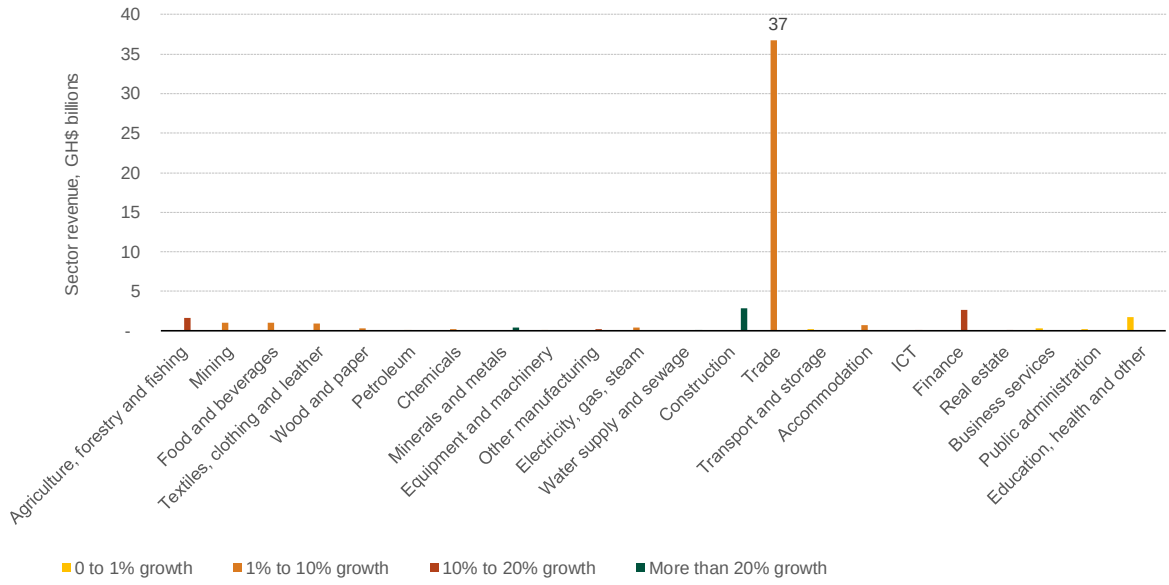
In Kumasi the three largest sectors (Trade, Construction and Finance) barely grow under the Standard Industrial Policy pathway.

Figure 53: Implications of Standard Industrial Policy pathway for Kumasi



Source: Own calculations (ibid); IBES II (2018)

Figure 54: Implications of Cities Matter pathway for Kumasi



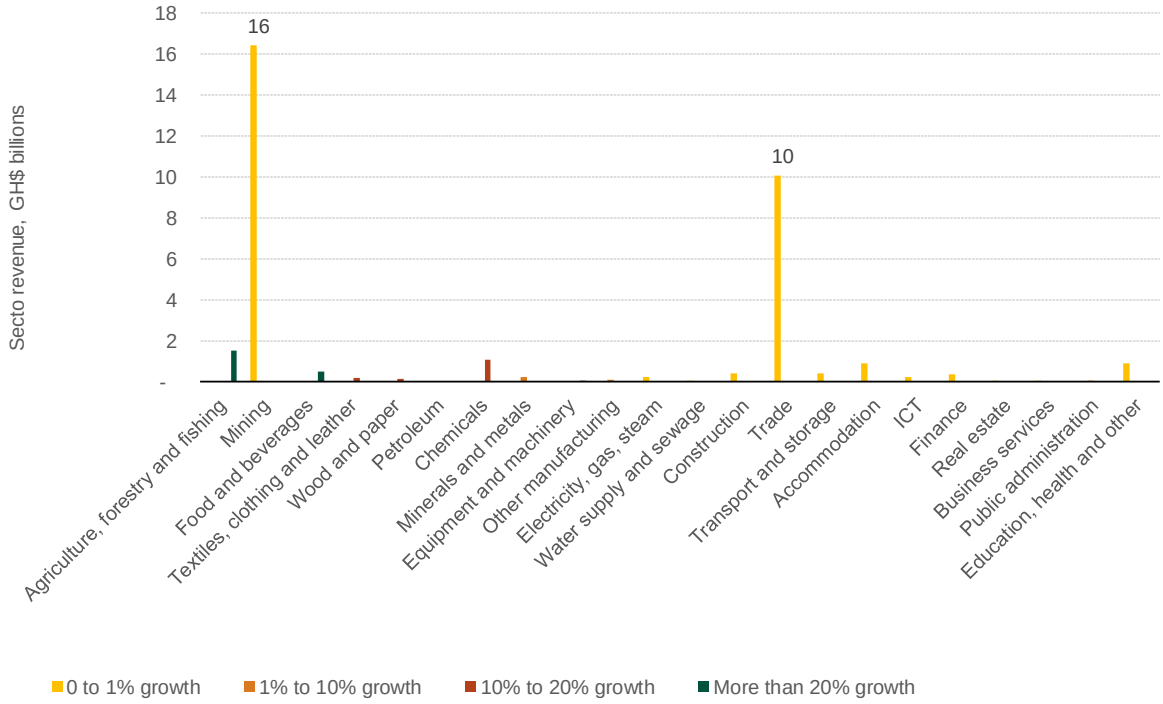
Source: Own calculations (ibid); IBES II (2018)

Under the Cities Matter pathway, all three the largest sectors grow significantly faster. Trade, the largest sector, improves from stagnant growth of less than 1% to growing between 1% and 10%. For construction and Finance, the improvement is even stronger. The former grows more than 20%, while the latter grows between 10 and 20%. The fourth largest sector, Education, health and other, does not register a change in performance, remaining at less than 1%.

6.5.3 Secondi-Takoradi

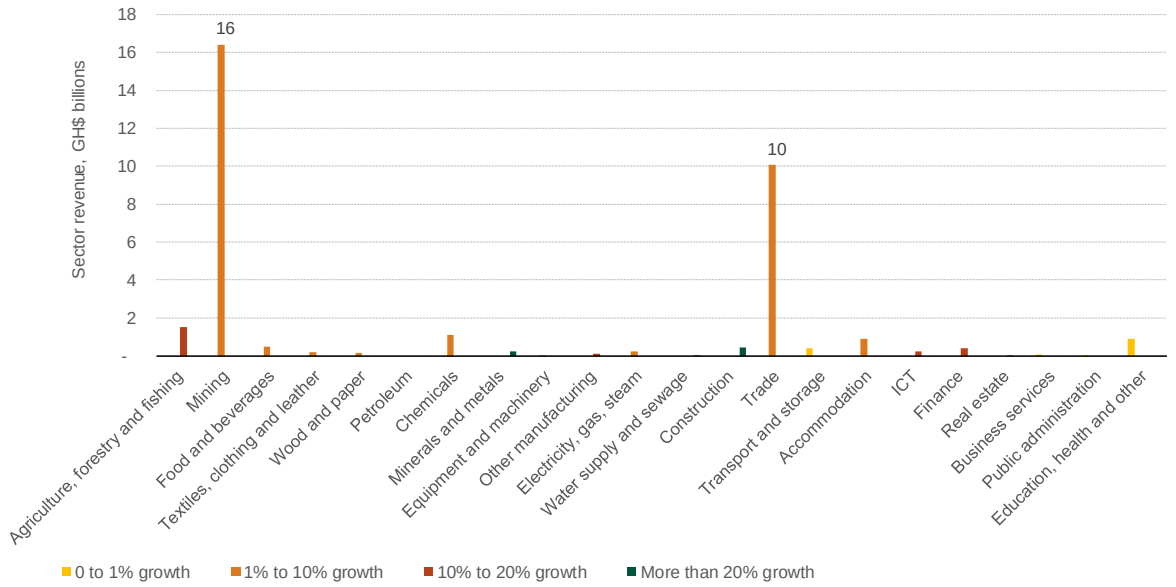
The economic structure in Secondi-Takoradi (based on the regional distribution) is expected to be different to the other two focus cities. Mining is the largest sector, followed by Trade and Agriculture, forestry and fisheries. Similar to Accra, and Kumasi, however, the three largest sectors grow more under the Cities Matter Pathway than under the Standard Industrial Policy pathway.

Figure 55: Implications of Standard Industrial Policy pathway for Secondi-Takoradi



Source: Own calculations (ibid); IBES II (2018)

Figure 56: Implications of Cities Matter pathway for Secondi-Takoradi

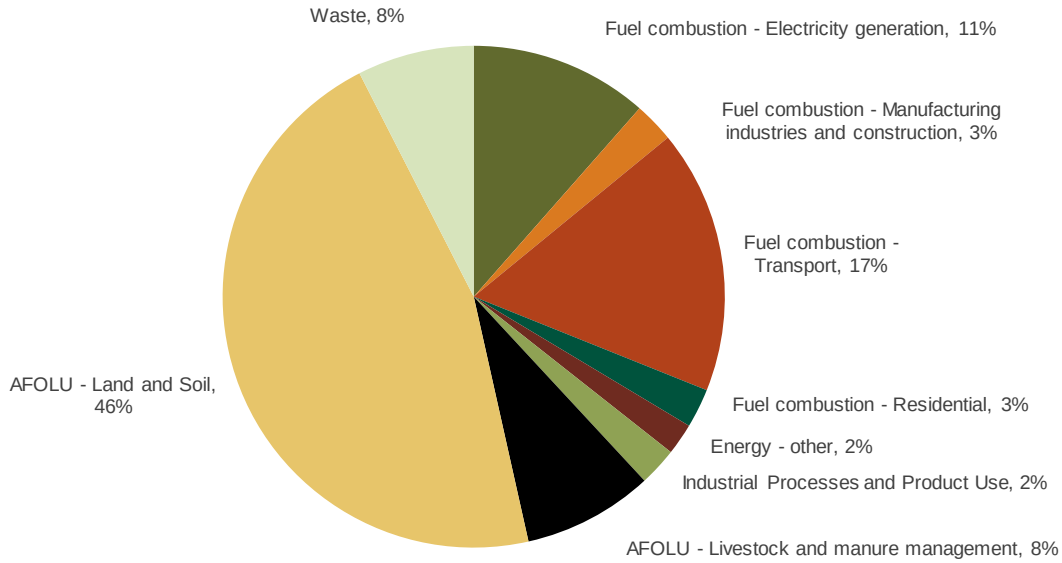


Source: Own calculations (ibid); IBES II (2018)

6.6 Implications for GHG emissions

Ghana's National Emissions Inventory Report (EPA, 2019) shows that the agriculture, forestry and other land use (AFOLU) emissions category contributes more than half of Ghana's national emissions, while emissions linked to industrial activity are relatively small.

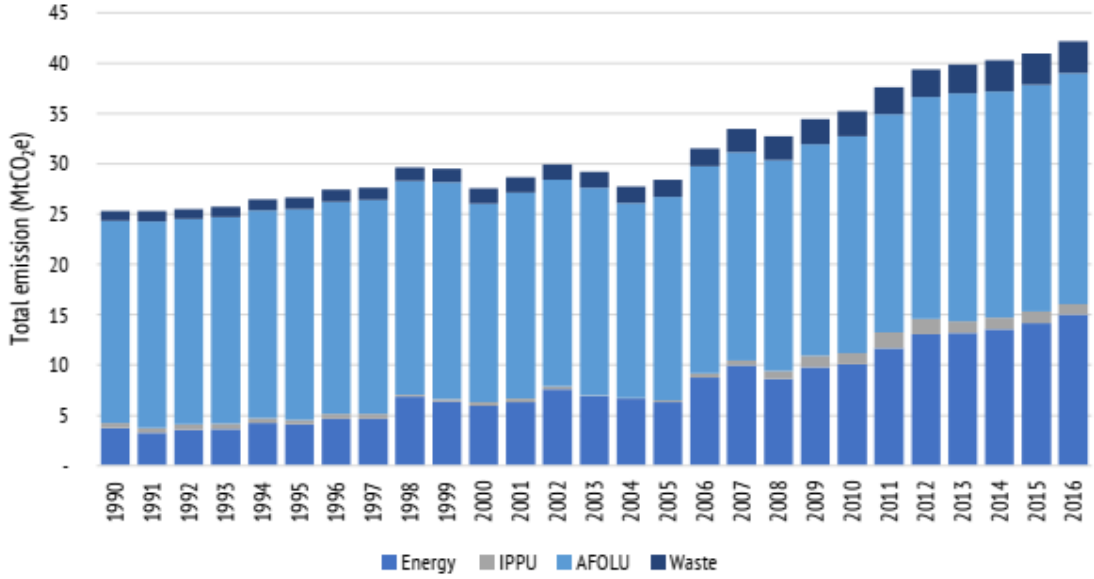
Figure 57: Sources of GHG Emissions in Ghana (2016)



Source: Calculations based on Ghana's Fourth National Greenhouse Gas Inventory Report (EPA, 2019)

The discovery of oil in Ghana has not significantly changed the country's GHG emissions trajectory. Towards the late 1990s there was a rapid shift from biomass fuel to crude oil as a primary fuel in Ghanaian in response to a government policy to diversify away from a reliance on biomass in the energy sector (EPA, 2019). Almost all the crude oil extracted in Ghana is exported, while natural has been displacing crude oil. Initially the gas originated from the West Africa Gas Pipeline, but from 2014 local supplies were also utilised. Electricity generation is the 2nd largest contributor to GHG emissions within the energy sector (contributing 4.84 $MtCO_{2e}$ out of an energy sector total of 5.21 $MtCO_{2e}$ in 2016). Even though energy sector emissions, and emission from the energy industries (which is dominated by electricity generation) in particular, have been growing in importance, they are still smaller than Agriculture, Forestry, and Other Land Use (AFOLU) in Ghana. And within the energy sector, transport emissions were almost 40% larger than energy industries emissions in 2016. Transport emissions have, however, been increasing at a slower rate than emissions from energy industries.

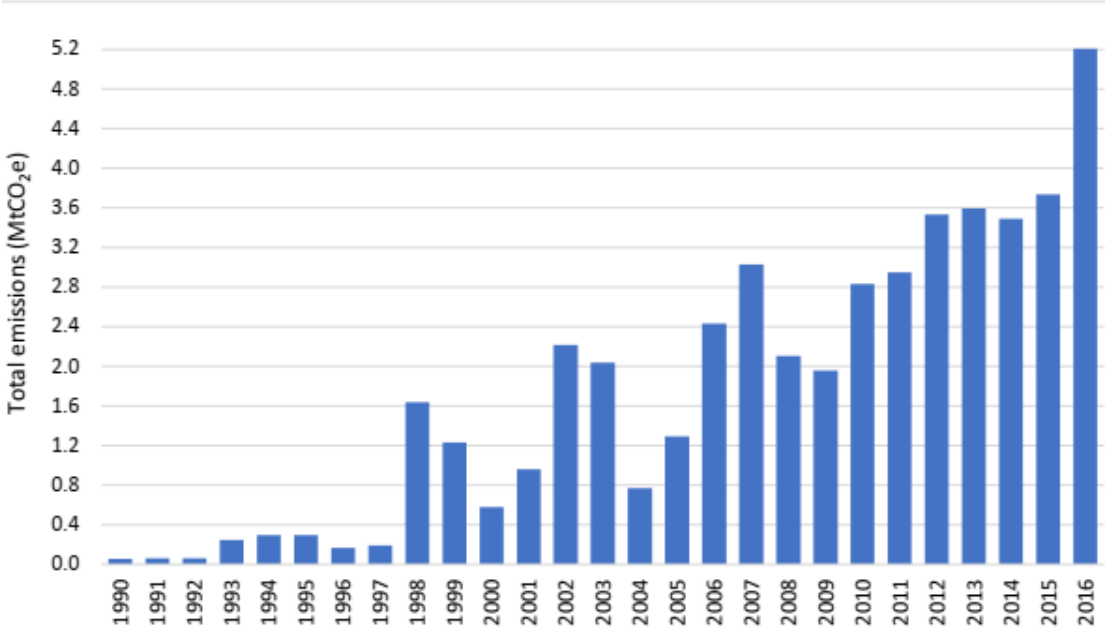
Figure 58: Emissions by category over time (1990 - 2006)



Source: (EPA, 2019)

The high level of emissions in the transport sector illustrates the fact that GHG emissions related to the oil and gas industry are concentrated in the consumption of these products, and not their extraction. While transport emissions stood at 7.17 $MtCO_{2e}$ in 2016, emissions linked to the exploitation of oil and gas reserves were only 0.05 $MtCO_{2e}$. Emissions from oil refining were five times larger at 0.25 $MtCO_{2e}$, but Ghana's only oil refinery predates the discovery of local oil reserves and these emissions cannot therefore be linked to the local oil industry.[30] Arguably the main impact on Ghana's GHG emissions pathway of the local discovery of oil been the increased utilisation of natural gas in electricity generation but given the existence of the West African Gas Pipeline even this link is debateable.

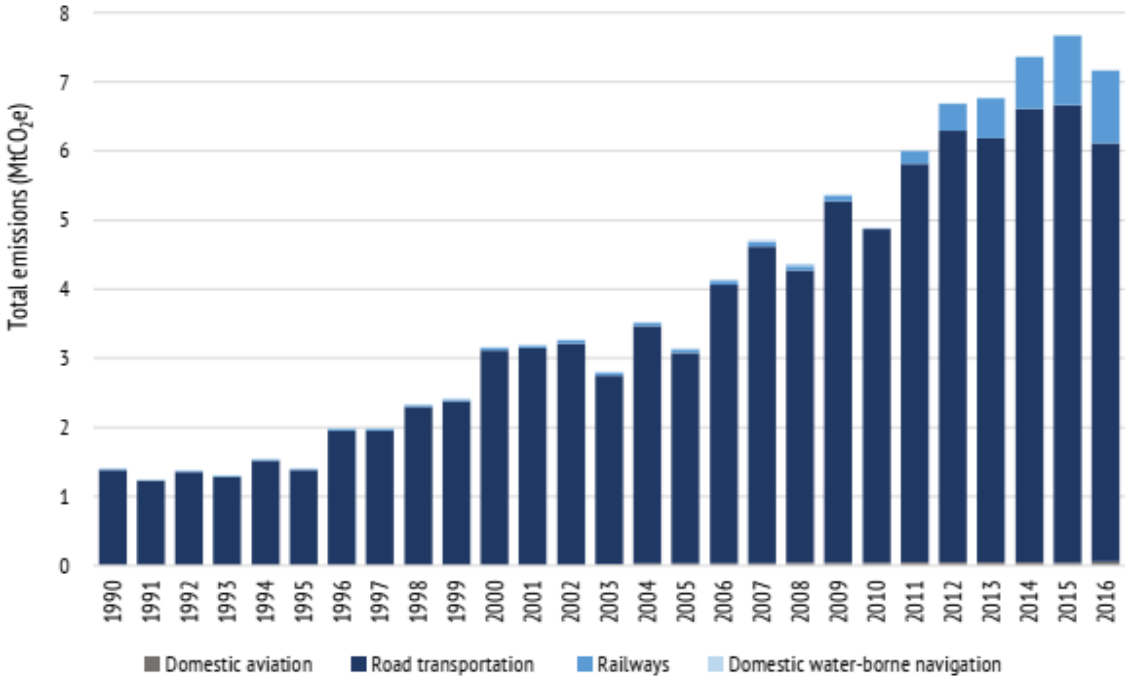
Figure 59: Energy sector emissions (1990 - 2006)



Source: (EPA, 2019)

[30] While increased oil production will logically lead to increased emissions, national emissions are accounted for on a production rather than consumption basis internationally. Emissions linked to Ghanaian oil or refined oil products emitted in other jurisdictions will thus not be reported as 'Ghanaian' emissions. An increase in net emissions will only happen if Ghanaian supply supplements current international production rather than displace more expensive oil from other sources. This has happened in Ghana, since no new refineries were developed, but it is not clear what the net impact on global oil supply was. For this reason, it is not clear by how much (if at all) global emissions have changed as a result of the discovery of oil in Ghana.

Figure 60: Transport emissions by category (1990 - 2006)



Source: (EPA, 2019)

Given that Ghana's emissions are largely concentrated in the AFOLU sector, it is expected that the Standard Industrial Policy pathway with its focus on agriculture and agro-processing will lead to a greater increase in GHG emissions than the Cities Matter pathway. Over time, as more domestic industries are developed, this will change – and it is important that plans are put in place to deal with this change when it materialises. But at present only a small percentage of emissions are linked to industrial activities, and in the short- to medium-term the Cities Matter pathway is expected to have a relatively benign impact on emissions. To test this assertion, a back-of-the-envelope calculation was undertaken to investigate the impact of the different industrial pathways on GHG emissions. The methodology described below was constrained by data and resource availability and should be viewed as indicative only. It is appropriate for the specific purpose it is employed, i.e. to test whether there is support for the assertion that the choice of industrial development pathway is unlikely to have a significant impact on Ghana's GHG emissions trajectory. It is not intended to forecast future GHG emissions.[31]

[31] Emissions scenario analysis is a highly technical endeavour that requires the development of an integrated set of emissions models. The reason for this is that technology choices, the types of inputs utilised in production processes and behavioural assumptions can have a significant impact on the level of emissions associated with a given level of output. Assuming a one-to-one relationship between output and emissions is thus misleading. On a practical level, IPCC emissions categories are linked to the purpose of the process that gives rise to emissions (i.e. generating heat or electricity). The International Standard Industrial Classification of All Economic Activities (ISIC), the system used to classify economic activity, is based on a value chain approach. Economic activity linked to extracting and beneficiation of minerals, for example, is treated differently. With the former being classified as a mining activity and the latter as a manufacturing activity. IPCC emissions categories do not follow this distinction, and emissions linked to a similar purpose (i.e. generating heat) are grouped together irrespective of where along the value chain they are generated. As a result, IPCC emissions categories do not map directly onto ISIC economic sectors.

Emissions that correspond to the base year of the SAM (2015) was obtained from Ghana's Fourth National Greenhouse Gas Inventory Report (EPA, 2019). Where possible, the disaggregated emissions data was linked to appropriate economic sectors in the SAM. The change in economic output under the two industrial development pathways was used to scale the emissions in a fixed proportion to the growth of the relevant economic sectors.[32]

As expected, the Cities Matter pathway leads to a much smaller increase in GHG emissions than the Standard Industrial Policy pathway, and the differential is entirely driven by a higher increase in AFOLU emissions under the Standard Industrial Policy pathway. Outside of the AFOLU sector, emissions increase marginally more under the Standard Industrial Policy pathway than under the Cities Matter pathway. Assuming urban farming won't lead to deforestation or additional land-based emissions, the Standard Industrial Policy pathway leads to an increase in Ghana's national emissions of 50%, whereas the Cities Matter pathway is estimated to only lead to a 4% increase in emissions.[33]

As mentioned above, a relatively crude methodology employed to estimate the impact of the two pathways on national GHG emissions. Thus, while the methodology probably overestimated the growth in emissions under the two pathways, and particularly the Standard Industrial Policy pathway (it is likely that at least some of the growth in the agriculture sector would come from increased efficiency and not only using additional land), the size of the difference in impact lends weight to the finding that the Cities Matter pathway is more carbon-efficient than the Standard Industrial Policy pathway. Importantly, the decoupling under the Cities Matter pathway occurs without taking account of the fact that various interventions undertaken as part of this pathway are expected to reduce emissions (e.g. biogas, recycling and renewable energy). The Cities Matter pathway could thus have significant co-benefits in the form of climate change mitigation, and this is an area for further research.[34]

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[32] Output was considered a more appropriate metric than GDP or value added since the use of intermediate inputs can give rise to emissions. Not all emissions are driven by an increase in output. Waste emissions, for example, are largely driven by population growth and income levels rather than economic activity. In fact, investments in appropriate technologies can lead to a significant decrease in GHG emissions when the volume of solid waste and wastewater that is treated increases.

[33] Ghana's National Emissions Inventory Report (EPA, 2019) shows that the majority of land-based national GHG emissions originate when forestland that is changed to cropland or grassland. The land in and around cities is typically already degraded (i.e. no longer forests). Changing grassland or degraded land to cropland, which is what urban farming would entail, is therefore unlikely to lead to a significant increase in emissions. Direct N2O emissions from managed land linked to fertilizer use could grow up, but urban agriculture involves much smaller areas than normal agriculture which means it is much easier to apply the correct amounts or fertiliser (i.e. not over-fertilize). And even if you over-fertilize the land area-to-crop ratio is much smaller, so any additional emissions will be much smaller extent than is the case with normal agriculture. The assumption that urban farming won't lead to deforestation or additional land-based emissions is therefore considered realistic. Furthermore, this assumption drives only a small part of the differential in emissions growth between the two pathways. If this assumption is removed, emissions grow by 10% under the Cities Matter pathway. This is more than double the original 4%, but it is still only a fifth of the 50% expected emissions growth under the Standard Industrial Policy pathway.

[34] Transport emissions grow more under the Cities Matter pathway, and this is at least partly due to smaller agriculture and processed food sectors necessitating increased emissions linked to the transport and distribution of food. But this is dwarfed by the reduction in AFOLU emissions relative to the Standard Industrial Policy pathway.

Table 10: Emissions implications of the Standard Industrial Policy and Cities Matter pathways

IPCC category	Category name and details	Total emissions (MtCO2e) (2016)			SAM sector	Standard Industrial Policy pathway growth	Cities Matter pathway growth	Standard Industrial Policy pathway emissions	Cities Matter pathway emissions
1	Energy	15.02						15.89	16.08
1A	Fuel combustion		15.0						
1A.1	**Energy industries**		**5.21**						
	Electricity generation			4.84	c-Electricity, gas, steam	4%	9%	5.02	5.26
	Refinery			0.25	c-Petroleum	4%	6%	0.26	0.26
	Manufacture of solid fuels			0.1	N/A			0.10	0.10
	Other energy industries (oil and gas sector)			0.02	c-Mining	1%	2%	0.02	0.02
1A.2	**Manufacturing industries and construction**		**1.09**						
	Food processing and beverages			0.11	c-Food, beverages and tobacco	140%	1%	0.26	0.11
	Mining and quarrying			0.70	c-Mining	1%	2%	0.70	0.71
	Wood & wood products			0.03	c-Wood and paper	13%	3%	0.04	0.03
	Construction			0.16	c-Construction	1%	62%	0.16	0.26
	Other and non-specified			0.09	c-Textiles, clothing and leather; c-Chemicals; c-Minerals and metals; c-Equipment and machinery; c-Other manufacturing	44%	60%	0.12	0.14
1A.3	**Transport Mobile**		**7.17**	7.17	c-Petroleum	4%	6%	7.48	7.59
1A.4	**Other Sectors**		**1.53**						
	Residential			1.06	N/A			1.06	1.06
	Agriculture/forestry/fishing/ fish farms			0.41	c-Cereals; c-Fruit and vegetables; c-Other crops; c-Livestock and livestock products; c-Forestry and fishing*	38%	3%	0.57	0.42

IPCC category	Category name and details	Total emissions (MtCO2e) (2016)			SAM sector	Standard Industrial Policy pathway growth	Cities Matter pathway growth	Standard Industrial Policy pathway emissions	Cities Matter pathway emissions
	Commercial/institutional			0.06	c-Accommodation; c-ICT; c-Finance; c-Real estate; c-Business services; c-Public administration; c-Education, health and other	1%	5%	0.06	0.07
1B	Fugitive emissions from fuel		0.02						
1B.2	Oil and Natural Gas (Fugitive emission)			0.02	c-Petroleum	4%	6%	0.03	0.03
2	Industrial Processes and Product Use	1.04						1.04	1.15
2A	Mineral Industry		0.33	0.33	c-Minerals and metals	3%	29%	0.34	0.43
2C	Metal Industry		0.09	0.09	c-Minerals and metals	3%	29%	0.09	0.12
2D	Non-Energy Products from Fuels and Solvent Use		0.00	0.00	N/A			-	-
2F	Product Uses as Substitutes for ozone depleting substances		0.61	0.61	N/A			0.61	0.61
3	Agriculture, Forestry, and Other Land Use	22.92						43.06	23.43
3A	Livestock		3.48	3.48	c-Livestock and livestock products	126%	2%	7.87	3.56
3B	Land		12.87						
3.B1	Forestland			-4.67	N/A			4.67	4.67
3.B2	Cropland			8.33	c-Cereals; c-Fruit and vegetables; c-Other crops*	30%	2%	10.84	8.46
3.B3	Grassland			8.80	c-Livestock and livestock products	126%	2%	19.92	9.01
3.B4	Wetland			0.03	N/A			0.03	0.03
3.B5	Settlement			0.17	N/A			0.17	0.17
3.B6	Other lands			0.20	N/A			0.20	0.20
3.C	Aggregate sources and Non-CO2 emissions sources on land		6.57						

IPCC category	Category name and details	Total emissions (MtCO2e) (2016)			SAM sector	Standard Industrial Policy pathway growth	Cities Matter pathway growth	Standard Industrial Policy pathway emissions	Cities Matter pathway emissions
3.C.1	Emissions from biomass burning			0.97	c-Cereals; c-Fruit and vegetables; c-Other crops; c-Livestock and livestock products*	44%	2%	1.39	0.98
3.C.2	Liming			0.00	N/A			-	-
3.C.3	Urea application			0.04	c-Cereals; c-Fruit and vegetables; c-Other crops*	30%	2%	0.05	0.04
3.C.4	Direct N20 Emissions from managed soils			4.14	c-Cereals; c-Fruit and vegetables; c-Other crops*	30%	2%	5.39	4.20
3.C.5	Indirect N20 Emissions from managed soils			1.14	c-Cereals; c-Fruit and vegetables; c-Other crops*	30%	2%	1.48	1.16
3.C.6	Indirect N20 Emissions from manure management			0.06	c-Livestock and livestock products	126%	2%	0.13	0.06
3.C.6	Rice Cultivation			0.22	c-Other crops	16%	3%	0.25	0.22
4	Waste	3.17						3.17	3.17
4.A	Solid Waste Disposal		1.16	1.16	N/A			1.16	1.16
4.B	Biological Treatment of Solid Waste		0.10	0.10	N/A			0.10	0.10
4.C	Incineration and Open Burning of Waste		0.08	0.08	N/A			0.08	0.08
4.D	Wastewater Treatment and Discharge		1.83	1.83	N/A			1.83	1.83
	Total	**42.15**		**42.15**				**63.16**	**43.84**
	Change in emissions		**50%**			**4%**			

Source: Own calculations based on modelling results shown in Section 6.4 and Ghana's Fourth National Greenhouse Gas Inventory Report (EPA, 2019).

**Growth rate for c-Fruit and vegetables was adjusted under Cities Matter pathway to reflect assumption that urban farming won't lead to deforestation or additional land-based emissions.*

7 CONCLUSION

Rapid urbanisation has coincided with stable and rapid growth in Ghana since the start of the millennium. Ghana's growth performance in recent decades is well above historical trends and is strong by global standards. While the oil and gas sector has contributed to growth since 2011, urbanisation has played an important role in densely populated urban areas like Accra and Kumasi. Since the early nineteen nineties, labour moved from agriculture to sectors like industry and services with very little unemployment, productivity gains which contributed towards GDP growth.

Investment in infrastructure, however, did not keep up with the rapid urbanisation. Today Ghana faces several urbanisation-linked challenges that are starting to threaten its rapid growth. These include rapidly growing slums, lowering levels of productivity and deficient infrastructure services that result in congestion, pollution and high operating costs. Thus, while Ghana has managed to combine urbanisation with growth better than most African countries, it still lags international trends. It has a lower level of development, and a much smaller manufacturing sector, than expected given its level of urbanisation. While Ghana's growth performance has improved significantly since 2000, it is growth is in line with that of the West Africa and Sub-Saharan Africa more generally. It only outperformed its peers in the year (2011) when its oil reserves started to be fully exploited. **International experience has shown that reliance on a new extractive industry makes it more difficult to create productive cities that can drive growth and development. This, coupled with the fact that Ghana is already struggling to deal with accelerating urbanisation, means that now is an important time to focus on creating compacted, connected and clean cities.**

Ghana's current industrial policy is focused on transforming the industrial sector through improving the competitiveness of local industries and promoting value addition in targeted industries, most notably in agriculture, agro-processing and chemicals and pharmaceuticals. Industrial policy currently does not have an urban dimension. To investigate the potential of a more urban-focused industrial policy, an alternative industrial development pathway was developed based on stakeholder input, and the impacts of this pathway relative to the status quo was investigated using a Social Accounting Matrix (SAM)-based multiplier model. This alternative pathway, labelled the Cities Matter pathway, was built around investments in transport infrastructure, low cost housing, support for informal and small-scale businesses operating in cities, renewable energy, waste recycling, urban agriculture and sustainable and local manufacturing.

The results showed that an urban-focused industrial policy could accelerate economic growth in Ghana while decreasing the carbon-intensity of the Ghanaian economy. Furthermore, the rising urban population is expected to stimulate demand for goods and basic services including social amenities and infrastructure. A development strategy built around turning cities into drivers of growth is therefore relatively low risk since demand for these goods and services are likely to remain strong in future. Focusing on urban demand could therefore also be a dependable strategy to support long-term economic growth and further address poverty.

There are several data gaps that complicate economic development and urbanisation planning in Ghana. Local information on important emerging sectors under the Cities Matter pathway is lacking. These include, amongst others:

- Small-scale renewables
- Urban agriculture
- New building methods and environmentally-friendly construction materials that would increase the local content of local infrastructure projects (e.g. reuse of building materials and building materials made from recycled plastic)
- Formalised small-scale urban recycling in areas like e-waste, for example.
- Technology-based urban management
- Sustainable local manufacturing.

Supplementing the current analysis, which relies on high-level data, international experience and assumptions to model the impact of interventions aimed at creating compacted, connected and clean cities, with locally collected and verified data, will greatly enhance confidence in the results.

Information on the economic activity within cities is also limited. This information is currently collected at a regional level. While this provides a useful indication of the economic profiles in the largest cities in the regions, confirming this with city-level data would enable a more nuanced analysis of the impact of urban-focused industrial policy, and would provide policymakers with a higher degree of certainty that the modelled results would translate into real impact on the ground.

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APPENDIX 1 GHANA'S DEVELOPMENT APPROACH

Ghana's industrial development strategy has evolved from import substitution to a private sector-led industrial strategy. This transpired through four distinct phases of industrialisation since independence in 1957: (1) inward-looking import substitution industrialisation era (1965-83); (2) an outward-looking liberalised industrial strategy (1984-2000); (3) a private-sector-led industrial policy targeting value-added processing (since 2001), and the current 10-point Industrial Transformation Agenda which is an extension of the third phase. Each of these phases are discussed in turn below.

A 1.1 Import substitution era (1965-1983)

Pre-1983, Ghana's industrial strategy had its foundation rooted in the colonial economic system, that was centred on extracting raw materials from the Gold Coast and creating an economic system that relied on importing manufactured products from Britain. Consequently, Ghana's industrial sector remained underdeveloped, and contributed very little to overall economic performance (Ackah, C., Adjasi, C., & Turkson, F., 2016).

The country's independence in 1957 ushered in new economic thinking. The government, led by the Convention Peoples Party (CPP), prioritised industrialisation with emphasis on import substitution as a key factor for modernisation and development in Ghana (Killick, 2010). In line with this, the government adopted an "Import Substitution Industrial (ISI) strategy." This was in line with the development approach being implemented in most post-colonial developing countries. The main impetus of the ISI strategy was to transform the country's industrial structure and reduce Ghana's reliance on imported goods through investing in large-scale, capital-intensive state-owned manufacturing industries and infrastructure. The state was involved in domestic production of hitherto imported consumer goods, processing of exports of primary products (agricultural and mining), and the expansion and development of building materials as well as electrical, electronic, and machinery industries.

The ISI strategy, however, had some limitations. For instance, the World Bank (1985) notes that the ISI strategy, by its nature, discouraged export growth and the development of the agriculture sector. This resulted in a situation where Ghana's foreign exchange earnings could not keep pace with what was required for the importation of raw materials and spares for the many import substituting industries that had been set up.

A 1.2 Outward liberalised industrialisation strategy (1983-2000)

Like many developing countries, Ghana adopted the World Bank/IMF Structural Adjustment Programmes (SAPs) as part of its economic reform process during the 1980s. The ISI strategy was replaced by the Economic Recovery Programme (ERP) in 1983. The ERP that was adopted as part of the continent-wide SAPs that promoted an outward liberalised industrialisation strategy. The new industrial strategy promoted the development of a more competitive industrial sector with a focus on local resource-based industries with export potential and import substitution only in areas where local competitive advantage existed. The ERP also brought in massive reforms and the restructuring the financial sector. Reforms under the ERP included the following: (1) the Central Bank allowed private and foreign banks to operate in the country; (2) the removal bank minimum savings rate and sectoral credit controls; and (3) the liberalisation of commercial banks interest rates and bank charges; among others (Ackah, C., Adjasi, C., & Turkson, F., 2016).

The ERP's industrialisation strategy shifted focus from the role of government as the main vehicle for industrial development to considering the private sector the main driver of industrialisation. This was done through the initiation of the state-owned enterprises (SOEs) reform programme. The major reforms that were contained in the SOEs reform programme are (Adda, 1996):

- Policy reforms to promote the commercialisation of SOEs such as the removal of price controls and introduction of limits to government financing of SOEs and the creation of new SOEs
- Institutional and legal reforms aimed at promoting the autonomy of SOE in day-to-day operations as well as strengthening their accountability to government through restructuring the State Enterprises Commission
- Rationalisation of the SOE sector through divestiture (sales or liquidations) and mergers to reduce the financial and managerial burden upon government
- Rehabilitation of selected priority SOES which have the potential to be financially viable and are deemed critical to the success of the ERP
- Improvements to SOE management and efficiency through staffing reductions, training programmes for managers and accountants, installation of Management Information Systems, and the preparation of corporate plans and financial audits
- Restoring financial solvency and discipline by clearing cross-debts and arrears and by establishing clear guidelines and procedures for government-SOE financial relations.

While ERP's policy approach yielded some positive impacts, these impacts were short-lived. In the early 1990s, the government introduced support to distressed but potentially viable industries to recover from the shock of the economic reforms. These measures, among others, included the setting up of the Business Assistance Fund, the Private Enterprise and Export Development Fund, the Trade and Investment Programme, the Fund for Small and Medium Enterprises Development, the Export Processing Zone (EPZ), and the Ghana Trade and Investment Gateway project.

A 1.3 Private sector led industrial policy (2000-2017)

Leading up to the new millennium, there was a focus on addressing the socio-economic development in Ghana. In response to this, Ghana's economic landscape witnessed the promulgation of several development policy strategies, which included:

- the World Bank/International Monetary Fund sponsored Interim Poverty Reduction Strategy Papers (2000-2002);
- two iterations of the Ghana Poverty Reduction Strategy i.e. GPRS I (2003-2005) and the GPRS II (2006-2009);
- two iterations of the Ghana Shared Growth and Development Agenda i.e. GSGDA I, (2010-2013), GSGDA II (2014-2017);
- the National Trade Policy (launched in 2005, but no specified period covered);
- the National Medium-term Development Framework (2010-2013); and
- two iterations of the Private Sector Development Strategy i.e. PSDS I (2005-2009) and PSDS II (2010-2015).

These development strategies provided renewed impetus to the post ERP agenda on private sector-led industrial production through the application of science and technology. The industrial strategy

during the period 2000-2017 aimed at creating an industrial architecture based on value-added processing of Ghana's natural resource endowments primarily by the private sector.

Within the context of Ghana's long-term strategic vision of attaining middle-income status by 2020, the National Democratic Congress government led by Prof. John Evans Attah Mills prepared a new national industrialisation strategy in 2009/10 to guide the transformation of the economy into an industry-driven economy. The new **Ghana Industrial Policy** offers a clear and transparent guideline for the implementation of government's industrialisation programme with a focus on growth, diversification, upgrading and competitiveness of the manufacturing sector.

In particular, the main development goals of the industrial policy are to:

- expand productive employment in the manufacturing sector;
- create a modern productive economy with high levels of value added;
- expand technological capacity in the manufacturing sector;
- promote agro-based industrial development;
- promote spatial distribution of industries in order to achieve reduction in poverty and income inequality;
- provide consumers with fairly priced, better quality products and services; and
- make firms within the industrial sector, notably manufacturing firms, competitive on both domestic and international markets (Government of Ghana, 2011)

The Ghana Industrial Policy, however, included no clear timelines or performance dates, and is technically still in force. Even though the industrial policy positions the private sector as the main driver of industrialisation in Ghana, the government plays an important role via the provision of the enabling environment for the private sector to effectively perform its role as the engine of growth in a dynamic and competitive economy.

A 1.4 The 10 Point Industrial Transformation Agenda (2017-2024)

In October 2017, the government launched the Coordinated Programme of Economic and Social Development Policies (2017-2024) (CPESDP), which defines the government's overall policy direction for the medium term. The CPESDP has five major priority areas, namely:

- Revitalising the economy
- Transforming agriculture and industry
- Strengthening social protection and inclusion
- Revamping economic and social infrastructure
- Reforming public service delivery institutions

As part of the numerous programmes designed to ensure the realisation of these goals, the government outlined the current industrial strategy coined the 10 Point Pillars of Government's Industrial Transformational Agenda (the 10 Point Agenda).[35]

[35] Other interventions contained in the CPESDP including the Planting for Food and Jobs programme, and the Nation Builders' Corps programme.

The 10 Point Agenda is aimed at transforming the industrial sector through improving the competitiveness of local industries and promoting value addition in specific industries, most notably in agro-processing. Similar to previous industrial strategies, the current industrial strategy adopts a private sector led approach to industrialisation, with government providing only a facilitation role and creating an enabling environment.

The 10 Point Pillars are:

1. **National Industrial Revitalization Programme**: This involves the provision of a stimulus package to economically viable but financially distressed companies. The government intends to create a quick disbursing stimulus fund of up to US$200 million (approximately GH¢ 960 million) to support this course.
2. **One District One Factory (1D1F)**: This policy is a major component of the government's industrial transformation agenda and is geared towards decentralising industrial development in Ghana. The aim of government is to build at least one medium- to large-scale industrial enterprise in each of the 254 districts that would utilise district-specific resources. The programme is to be led by the private sector with the state only facilitating the process.[36]
3. **Strategic Anchor Industries**: Under this pillar, the Government of Ghana intends to position Ghana's industrial landscape around certain industrial patterns and products. Therefore, the investment shall be centred on strategic anchor industries such as agro-processing, pharmaceuticals, integrated aluminium production, iron and steel, auto mobile and vehicle assembly, textiles, garments and apparel, industrial salt, petrochemicals, manufacturing of machines and machinery components, industrial starch and oil palm. The implementation will follow an Industrial Parks and Special Economic Zones (IPs & SEZs) approach.
4. **Industrial Parks and Special Economic Zones**: The Ministry of Trade and Industry will facilitate the acquisition of land for the establishment of industrial parks nationwide. The idea is to establish at least one industrial park/special economic zone in each of the ten regions of Ghana. These parks will be Free Zones enclaves with access to reliable support infrastructure including energy supply.
5. **Development of small and medium-scale enterprises**: This pillar seeks to provide the needed assistance to the operations of small and medium scale enterprises.
6. **Export Development Programme**: The Ministry of Trade will encourage, and support businesses located in industrial parks and special economic zones to take advantage of the existing trade agreements that are in place i.e. African Growth and Opportunity Act (AGOA) and the Economic Partnership Agreement (EPA). This is especially important for companies located in free zones that will be required under the law to export about 70% of their production.
7. **Enhancing Domestic Retail Infrastructure**: This pillar will focus on enhancing the competitiveness of locally manufactured products relative to imports. Interventions such as

[36] However, the government may establish and divest later in cases where there is no private promoter for the identified business opportunity in a district.

the One District One Factory and the industrial revitalisation programme will lead to large volumes of production.

8. **Business Regulatory Reforms**: This involves putting in place measures to ease the cost of doing business in the country through removing bureaucratic delays and other red tape.
9. **Industrial sub-contracting exchange**: This is intended to link SMEs to large companies to facilitate the subcontracting of business to the SMEs.
10. **Improving Public-Private sector Dialogue**: It is expected that at least one Business Summit will be hosted annually to review the implementation of various initiatives and take stock of the strides made and steps being taken to address identified implementation challenges.

In conclusion, the interventions contained in the 10-Point Industrial Transformation Agenda are expected to be financed through a public-private arrangement where the government's development partners provide the required funding amount for the various interventions, while the government provides the enabling environment required for the take-off of each of the pillars. The framework for the effective implementation of the 1D1F programme depends on the successful constitution of District Implementation Teams (consisting of public servants and consultants) that are tasked with providing the necessary infrastructure (such as roads, electricity and water) for the smooth take-off of the supported businesses.

APPENDIX 2 OVERVIEW OF SAM ANALYSIS

A 2.1 Impact assessment using a Social Accounting Matrix

The detailed production structure of an economy at a point in time is generally laid out in a country's supply-use table (SUT) or input-output table (IOT). These tables show the demand and supply linkages between different industries in an economy. A social accounting matrix (SAM) extends this snapshot, linking the structure of an economy provided in SUTs and IOTs to endowment factor incomes and institutional sector accounts. Figure A. 1: provides a summary of the basic structure of a SAM.

Figure A. 1: Basic structure of a SAM

		Expenditure columns							
		Activities C1	Commodities C2	Factors C3	Households C4	Government C5	Savings and investment C6	Rest of world C7	Total
Income rows	Activities R1		Domestic supply						Activity income
	Commodities R2	Intermediate demand			Consumption spending (C)	Recurrent spending (G)	Investment demand (I)	Export earnings (E)	Total demand
	Factors R3	Value-added							Total factor income
	Households R4			Factor payments to households		Social transfers		Foreign remittances	Total household income
	Government R5		Sales taxes and import tariffs		Direct taxes			Foreign grants and loans	Government income
	Savings and investment R6				Private savings	Fiscal surplus		Current account balance	Total savings
	Rest of world R7		Import payments (M)						Foreign exchange outflow
	Total	Gross output	Total supply	Total factor spending	Total household spending	Government expenditure	Total investment spending	Foreign exchange inflow	

Source: Breisinger, C., M. Thomas, and J. Thurlow. 2009. Social accounting matrices and multiplier analysis: An introduction with exercises. Food Security in Practice technical guide 5. Washington, D.C.: International Food Policy Research Institute.

Through these tables, the flow of goods and services between industries can be illustrated. These tables are also used to assess the impact of various economic changes on different parts of the economy, without requiring the use of a complex computable general equilibrium model.

The linkages between sectors in terms of inputs and outputs in a SAM can be easily interrogated by policymakers, and a SAM model can be used to calculate the quantitative impacts of different investment decisions on an economy through the use of multiplier analysis. Multipliers track the impact of an investment in one sector on all other sectors (and actors like households and government) within an economy, and also provides an estimate of the overall impact of the investment on economy-wide growth. This is illustrated via an example below.

A 2.2 Ghana's economic structure based on the available SAM

For Ghana, the most recent publicly available SAM was developed and published by the Ghana's Statistical Service, in collaboration with the Institute of Statistical, Social and Economic Research (ISSER) and the International Food Policy Research Institute (IFPRI). This SAM provides a snapshot of Ghana's economics linkages for 2015, across 55 activity sectors and 56 commodity sectors. The table that follows provides an aggregated summary of this SAM.

Key aspects of the SAM are highlighted as follows:

- Commodity outputs – The value of goods and services produced by each sector. The SAM also includes private ("household") output that is both produced and consumed internally by households, largely reflecting subsistence household production.
- Intermediate inputs into production – The value of goods and services utilised by each sector in the production of that sector's outputs.
- Factor endowments used in production – The value of payments to the factors of production, primarily land, labour and capital. This also reflects the gross value added (GVA) / GDP at factor cost.
- Transaction costs – the trade and transportation costs related to the movement of goods between producers and borders. This is explicitly reflected within the SAM for each commodity and allocated as payments to the trade and transport sectors.
- Taxes – tax payments (and tax transfers to the government). This includes product taxes (for commodities), factor taxes (capital) and corporate and household taxes.
- Consumption – the purchase and consumption of goods and services by households and governments.
- Trade with rest of the World – import and exports of commodities by Ghana.

Table A. 1: Aggregated SAM for Ghana, 2015, (Billions of GH₵)

		Activities						Commodities						Transaction costs	Labour	Capital and land	Enterprises and households	Government	Taxes	Net investment	Exports	Total demand and income
		Primary Agriculture	Forestry and fishing	Mining	Manufacturing	Utilities and construction	Services	Primary Agriculture	Forestry and fishing	Mining	Manufacturing	Utilities and construction	Services									
Activities	Primary Agriculture							19.4									5.1					**24.5**
	Forestry and fishing								5.4								0.1					**5.5**
	Mining									30.8												**30.8**
	Manufacturing										25.7						1.8					**27.6**
	Utilities and construction											41.4										**41.4**
	Services												119.7									**119.7**
Commodities	Primary Agriculture	0.6			6.4		1.4										11.5			0.4	5.5	**25.9**
	Forestry and fishing		0.2		2.3		0.4										2.2			0.9	0.0	**6.0**
	Mining		0.0	0.1	4.7	3.4	0.0													1.2	24.8	**34.3**
	Manufacturing	2.3	0.7	12.2	6.2	12.4	17.8										29.4			9.6	6.3	**96.9**
	Utilities and construction	0.2	0.2	1.4	0.4	1.2	4.5										7.2			26.4	0.0	**41.4**
	Services	0.8	0.7	9.0	0.8	2.1	35.1							22.4			31.4	22.3			19.2	**143.9**
Transaction costs								4.5	0.6	2.2	15.1											**22.4**
GVA	Labour	8.0	0.7	1.9	1.9	2.7	28.0															**43.2**
	Capital and land	12.6	3.1	6.3	4.7	19.6	32.4														0.8	**79.4**
Enterprises and households															43.2	76.5	59.3	10.6			5.0	**194.6**
Government																	6.4		22.5		2.8	**31.6**
Taxes								0.7	0.0	0.0	12.7	0.0	1.5				7.4					**22.5**
Net savings																	32.9	-3.1		2.5	8.6	**41.0**
Imports								1.2	0.1	1.2	43.3	0.0	22.7			2.9		1.7				**73.1**
Total supply and expenditure		**24.5**	**5.5**	**30.8**	**27.6**	**41.4**	**119.7**	**25.9**	**6.0**	**34.3**	**96.9**	**41.4**	**143.9**	**22.4**	**43.2**	**79.4**	**194.6**	**31.6**	**22.5**	**41.0**	**73.1**	

Source: Own calculations based on: Report on the 2015 Social Accounting Matrix (SAM) for Ghana, Ghana Statistical Services.
Source data from: Ghana Statistical Services, 2017, "Social Accounting Matrix (SAM) 2015", http://www2.statsghana.gov.gh/nada/index.php/catalog/95.

APPENDIX 3 SAM ANALYSIS: DATA AND MAIN ASSUMPTIONS

A 3.1 Consolidation of SAM and additional sectors

For this analysis the SAM was consolidated into 26 "activity" and "commodity" sectors. Additional sectors were also added to the SAM to provide a representative view of the renewable energy sectors (solar PV and biogas), as well as potential opportunities in the sustainable manufacturing sector (such as alternative construction materials and the production of consumption goods from sustainable sources).

Table A. 2: Summary of consolidated sectors in SAM, GH₵ millions (2015)

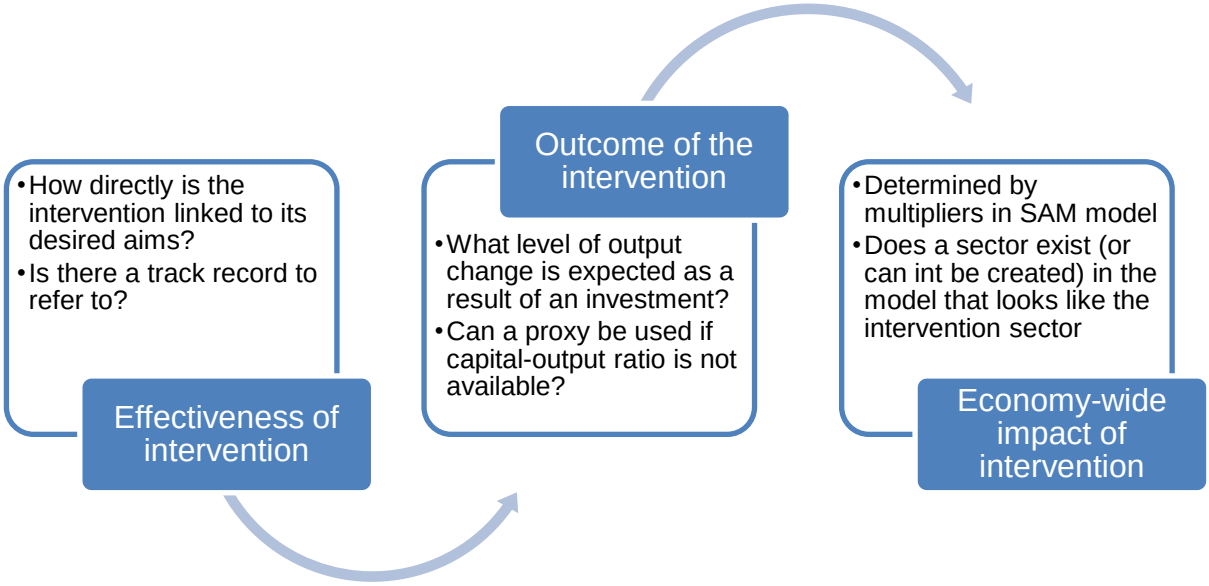
Activity sector	Total output
Cereals	4,915
Fruit and vegetables	7,468
Other crops	8,687
Livestock and livestock products	3,421
Forestry and fishing	5,468
Mining	30,803
Food, beverages and tobacco	9,599
Textiles, clothing and leather	1,155
Wood and paper	3,516
Petroleum	7,627
Chemicals	2,724
Minerals and metals	2,469
Equipment and machinery	106
Other manufacturing	356
Electricity, gas, steam	8,525
Water supply and sewage	4,540
Construction	28,369
Trade	20,067
Transport and storage	22,119
Accommodation	11,215
ICT	8,179
Finance	7,891
Real estate	6,067
Business services	10,745
Public administration	14,831
Education, health and other	18,548
Renewable energy*	85
Waste to energy*	9
Sustainable manufacturing*	2

Source: Own calculations based on (GSS, ISSER and IFPRI, 2017).
Source data available at http://www2.statsghana.gov.gh/nada/index.php/catalog/95
** This reflects additional / new sectors that were added to the existing SAM for purposes of this study.*

A range of literature sources were used in order to estimate the production structure of these additional sectors (see A 3.3), and the final activity-commodity structure for these additional sectors is detailed in A 3.3. The total output for the activity sectors included in the SAM is also shown in that section.

The interventions that are included in the two pathways depend on the availability of data. A SAM includes only flow variables in a specific period, and to generate the indicators that are of interest to policy makers additional exogenous information is needed. To create a realistic assessment of the longer-term impact of an intervention, three types of information is required as illustrated in the figure below.

Figure A. 2: Information required to model economy-wide impact of intervention



Source: DNA Economics

The starting point for the multiplier analysis is the focus on the operational, rather than capital, impact of the interventions and investment. That is, the multiplier analysis for the two industrial pathways aims to assess the impact of the interventions beyond the initial implementation. For example, rather than focusing on the impact of the *construction-phase* of a large-scale electricity generation plant, the multiplier analysis aims to understand the longer-term impact of *running* the plant.[37]

The rationale for focusing on operational, rather than initial capital, impact is twofold. First, construction projects are likely to have very similar impact profiles, regardless of the sectoral focus. This is because the construction projects will largely be capital-oriented, and because the multiplier analysis will have a large proportion of capital investment being modelled through the construction sector. Second, focusing on the operational impact of the interventions provides a better assessment

[37] An important caveat here is that for some of the alternative pathway interventions, projects have been modelled based on the expected operational profile of the capital investment, given that some of these projects will be implemented over a medium-to-long term period. For example, low-cost housing and transport infrastructure projects have been modelled using the expected operational impact of the construction phase, given that these projects have long-term construction horizons.

of the long-term impact since the multiplier analysis focuses on the intervention impact beyond the construction phase. It thus focuses on the lasting impact of a project or intervention.[38]

Table A. 3: Incremental capital-output ratios used in analysis

SAM sector	Est. Incr. Capital-Output ratio
Cereals	0.07
Fruit and vegetables	0.07
Other crops	0.07
Livestock and livestock products	0.07
Forestry and fishing	30.56
Mining	2.06
Food, beverages and tobacco	0.14
Textiles, clothing and leather	0.22
Wood and paper	1.31
Petroleum	0.02
Chemicals	3.62
Minerals and metals	1.44
Equipment and machinery	0.07
Other manufacturing	0.05
Electricity, gas, steam	1.76
Water supply and sewage	1.55
Construction	0.05
Trade	0.04
Transport and storage	0.29
Accommodation	0.99
ICT	0.32
Finance	0.09
Real estate	0.16
Business services	0.16
Public administration	2.71
Education, health and other	0.57
Renewable energy*	1.76
Waste to energy*	1.76
Sustainable manufacturing*	0.05

Source: Own calculations based on (Ghana Statistical Service, June, 2018).
This reflects additional / new sectors that were added to the existing SAM for purposes of this study.
** The capital-output ratio for the electricity, gas and steam sector was used as a proxy for the renewable energy and waste to energy sectors. The capital-output ratio for the other manufacturing sector was used as a proxy for the sustainable manufacturing sector.*

However, translating the capital investment into operational impact first requires an estimate of how much additional output results from an additional unit of capital investment.[39] These "capital-output"

[38] This does however not mean that all construction phase impacts have to be ignored. Redirecting investment from a large-scale power project like a hydroelectric dam to decentralised PV may very well necessitate a long-term roll-out of smaller projects that for all intents and purposes will look like a 'permanent' increase in the size of a PV installation sector. Provided that sufficient information is available, this could be modelled as an increase in a sector like Services. This requires quite detailed information on input requirements of capital projects, and as a result this has not been included in the current analysis.

[39] An investment in a sector where capital is deployed very effectively will lead to a larger increase in output for a given investment that an investment in a sector where capital isn't as productive.

ratios have been calculated using data from Ghana's Statistical Service.[40] This is summarised in the table above. As can be seen from this table, capital output ratios vary widely across sectors, and this variance plays a significant role in determining the ultimate multiplier "impact" of capital investment in different sectors.

A 3.2 Other assumptions and limitations

A number of other assumptions and limitations related to the SAM multiplier analysis must be highlighted. First, the Ghanaian SAM used is nominal in nature. This implies that any multiplier changes estimated using the SAM will also be nominal in nature. In relation to changes in the demand for labour, the nominal nature of the SAM implies that it is difficult to estimate the change in the *number* of employees, across each labour band. This is especially so given limitations related to linking the SAM data to detailed labour information for Ghana. The analysis therefore provides percentage changes in nominal terms, for all variables assessing the two different pathways.

A 3.3 Additional sectors included in the SAM

The table that follows provides a summary of the input and production structure for the three additional sectors included in the SAM. This was based identified literature that provided some information for the production structure of these or similar sectors, including (Adu & Lohmueller, 2012), (Ecovon, 2016), (KPMG, 2012), (Kumi & Brew-hammond, 2013), (Mohammed, et al., 2016), (Wageningen UR, 2005), (Ahiataku-Togobo, 2015) and (IRENA, 2016). In some instances, the production structure reflects some assumptions in terms of the distribution of inputs.

Several "balancing" assumptions were made to ensure that the structure of the SAM maintained a demand-supply balance. This is reflected in the table below. For stratified sectors (such as households and labour) allocations were done on a proportionate basis, using the existing total shares in the SAM.

[40] Capital-output ratios were calculated using information from the Phase II Integrated Business Establishment Survey (see (Ghana Statistical Service, June, 2018)). Total capital stock (excluding land) was estimated as the sum of fixed assets, revenue was used as the proxy for output.

Table A. 4: New sectors added to SAM, input and production structure

	Renewable energy	Waste to energy	Sustainable manufacturing
C-Other crops	0%		25%
C-Renewable energy	0%		
C-Equipment	10%	15%	
C-Other manufacturing	1%		33%
C-Education, health and other	1%		
C-Chemicals		5%	
C-Electricity, gas, steam			15%
C-Water supply and sewage		33%	1%
C-Transport and storage		5%	
C-Finance		10%	7%
C-Education, health and other			5%
Enterprises	0%		
Labour	3%	5%	6%
Capital	85%	27%	5%
Household	0%		
Govt	0%		
Tax	0%		3%
Rest of World	0%		
Total	100%	100%	100%
Initial size of output	**0.5% of electricity sector**	**0.1% of electricity sector**	**0.5% of other manufacturing sector**

Source: Own estimates based on various sources.
A – reflects activity sectors
C – reflects commodity sectors

Table A. 5: Balancing distribution of additional sectors in SAM (Millions GH¢)

	A-Renewable energy	A-Other manufacturing	A-Education, health and other	A-Waste to energy	A-Transport and storage	A-Finance	A-Sustainable manufacturing	A-Other crops	C-Renewable energy	C-Equipment	C-Other manufacturing	C-Education, health and other	C-Waste to energy	C-Chemicals	C-Electricity, gas, steam	C-Water supply and sewage	C-Transport and storage	C-Finance	C-Other crops	C-Sustainable building	Enterprises	Labour	Capital	Household	Govt	Tax	Rest of World	Distributed according to SAM	Total
A-Renewable energy									85																				**85**
A-Other manufacturing		1									1																		**1**
A-Education, health and other												1																	**1**
A-Waste to energy														3	5														**9**
A-Transport and storage																	0												**0**
A-Finance																		1											**1**
A-Sustainable manufacturing											2																		**2**
A-Other crops																													
C-Renewable energy																												85	**85**
C-Equipment	9			1																									**10**
C-Other manufacturing	1						1																					1	**3**
C-Education, health and other	1						0																						**1**
C-Waste to energy																													
C-Chemicals				0																								3	**3**
C-Electricity, gas, steam							0																					5	**5**
C-Water supply and sewage				3			0									-3													**0**
C-Transport and storage				0																									**0**
C-Finance				1			0																						**1**
C-Other crops							0																						**0**
C-Sustainable building																													
Enterprises																													
Labour	3	1	1	0			0																						**5**
Capital	72			2			0																						**75**

	A-Renewable energy	A-Other manufacturing	A-Education, health and other	A-Waste to energy	A-Transport and storage	A-Finance	A-Sustainable manufacturing	A-Other crops	C-Renewable energy	C-Equipment	C-Other manufacturing	C-Education, health and other	C-Waste to energy	C-Chemicals	C-Electricity, gas, steam	C-Water supply and sewage	C-Transport and storage	C-Finance	C-Other crops	C-Sustainable building	Enterprises	Labour	Capital	Household	Govt	Tax	Rest of World	Distributed according to SAM	Total
Household																						5	37		30		15		**87**
Govt																							0			1	32		**33**
Tax							0			1																			**1**
Rest of World										9	0												38						**47**
Distributed according to SAM					0	1						0			0	3		0	0					87	3				**95**
Total	**85**	**1**	**1**	**9**	**0**	**1**	**2**		**85**	**10**	**3**	**1**		**3**	**5**	**0**	**0**	**1**	**0**			**5**	**75**	**87**	**33**	**1**	**47**	**95**	

Source: Own estimates.
A – reflects activity sectors
C – reflects commodity sectors

APPENDIX 4 CONSTRUCTING THE STANDARD INDUSTRIAL POLICY PATHWAY

The fiscal projections for the 1D1F programme (GH¢ 508 million supporting 79 projects) and the Stimulus Package programme (GH¢ 95 million supporting 80 companies) are detailed below.

A 4.1 The One District One Factory Pillar

The Ghana Export-Import (EXIM) Bank is the main financial driver behind the 1D1F. In the 2018 budget statement, the government indicated that about 191 projects in 102 districts were selected for implementation, with support estimated at GH¢2 million for each district. However, by the end of November 2018 only 79[41] projects were supported (or in the process of being supported) across nine regions.[42] Of the 79 projects, a significant number of the projects are in the agro-processing sector (34), while 37 companies are engaged in various manufacturing activities including production of cosmetics and pharmaceuticals. The remaining companies are in the livestock (7) and other undefined (1) sectors (see table below).

Geographically, we also observe that the majority (22) of the businesses are situated in the Greater Accra, followed by Ashanti and Brong Ahafo regions where 13 businesses were supported in each region. On the other hand, the Upper West, Volta and Western regions only have one business each being supported. Within the Brong-Ahafo region, the support is predominantly concentrated on agro-processing, while those in the Greater Accra region are mainly engage in manufacturing activities.

Table A. 6: Projects supported businesses under the 1D1F initiative by region and sector, 2018

Sector	Ashanti	Brong Ahafo	Central	Eastern	Greater Accra	Northern	Upper West	Volta	Western	Total
Agro-processing	4	9	3	6	6	4	1	1	0	**34**
Manufact-uring*	6	4	5	5	15	1	0	0	1	**37**
Livestock	3	0	0	2	1	1	0	0	0	**7**
Others	0	0	0	1	0	0	0	0	0	**1**
Total	**13**	**13**	**8**	**14**	**22**	**6**	**1**	**1**	**1**	**79**

Source: Authors' based on information obtained from the 1D1F secretariat
*Note: *Manufacturing activities captured here include cosmetics and pharmaceuticals.*

In order to compute the projected fiscal allocation under 1D1F for 2018, we will use two assumptions: (i) each project supported in Table 1 was in one district, which estimates the total number of districts to 79; (ii) each district under the 1D1F received GH¢2 million earmarked for, as estimated in the budget statement. Based on these assumptions, the total budgetary allocation for 2018 amounting to GH¢ 508 million is presented in the table below (GH¢2 million for each of the 254 eligible districts)

[41] During the presentation of the 2019 budget statement of the Republic of Ghana, the Minister of Finance indicated that only 55 companies had received financial support under the 1D1F initiative.

[42] As at the end of 2018, Ghana had 10 regions. However, following a referendum held in December 2018, six new regions were created and was formally introduced in February 2019. For this purpose of this discussion, we would focus on the 10 regions. By the end of the first year of the implementation of the 1D1F programme, none of the 1D1F supported businesses were situated in the Upper East region.

allocated to sector in relation to the number of projects supported. 90% of the allocation went towards manufacturing and agro-processing.

Table A. 7: Projected fiscal allocations to firms supported under the 1D1F initiative (by sector), 2018

Sector	Number of Projects	Budgetary allocation ('million GHC)	Percentage of allocation
Agro-processing	34	218.63	43%
Cosmetics and pharmaceuticals	37	237.92	47%
Livestock	7	45.01	9%
Others	1	6.43	1%
Total	**79**	**508.00**	**100%**

Source: Authors' based on information obtained from the 1D1F secretariat

Relatedly, the government, in its 2019 budget statement, maintained that it is committed to encouraging the inflow of foreign direct investment (FDI) to the tune of US$10 billion in 2019 to implement the 1D1F initiative. In 2019, the government intends to increase the number of districts by 101 (see table below), supporting a total of 181 districts under 1D1F in 2019, which represents 69% of the country's 264 districts. The sources of financing are tabulated below for each project.

Table A. 8: Additional projects to be supported under the 1D1F programme in 2019

Number of projects	Source of financing
33 projects	to be financed by 1D1F participating financial institutions
56 small processing facilities	to be financed through the Rural Enterprises Programme
5 common user facilities	to be financed through the Rural Enterprises Programme
8 China National Building Material Company (CNBM) projects	to be financed through the CNBM programme

Source: Authors' based on information obtained from the 1D1F secretariat

A 4.2 The National Industrial Revitalisation Programme Pillar

The government of Ghana, in collaboration with participating financial institutions has earmarked a total funding amount of GH¢95 million to be used to support beneficiary firms under the Stimulus Package Programme. The funding is allocated between capital expenditure and goods and services, where the capital expenditure constitutes 90% and the remaining 10% is goods and services.

In 2018, 80 firms were supported across various industries (see table below). Of these 80 firms, 60% are involved in the agri-business sector while about 13% manufacture chemicals and pharmaceuticals. In order to compute the projected fiscal allocation under the Stimulus Package Programme for 2018, we will use two assumptions: (i) the projected fiscal allocation of GH¢95 million is used to equally support each of the 80 beneficiaries; (ii) the sector allocation depends on the proportion of beneficiaries in each sector relative to the total number of beneficiaries. Based on these assumptions, we derived the relative allocation to each of the sectors (see the fifth column in the table below). For instance, about GH¢57 million are allocated to firms engaged in the agri-business sector.

Table A. 9: Projected fiscal allocations under the Stimulus Package Programme, by sector for 2018

Nature of business	Number of Beneficiary firms	Budgetary allocation ('million GHC)	Percentage of allocation
Agri-business	48	57.00	60%
Chemicals and Pharmaceuticals	10	11.88	13%
Electrical and Electronics	3	3.56	4%
Garment and Textiles	5	5.94	6%
Building Materials	6	7.13	8%
Plastics and Packaging	6	7.13	8%
Services	2	2.38	3%
Total	**80**	**95.00**	**100%**

Source: Authors' based on information obtained from the 1D1F secretariat and Budget Statement
Note: 90% of the total budgetary allocation to each sector is for Capex while the remaining 10% is for Goods and Services.

APPENDIX 5 ALTERNATIVE CITIES MATTER PATHWAY

The original Cities Matter pathway interventions modelled, taking into consideration stakeholder input but relying heavily on the nascent 'Sustainable manufacturing to drive results, and the investment summarised by SAM sector is shown in the tables below.

Table A. 10: Initial Cities Matter pathway

Type of Project	SAM model Sector	Distribution	('million GHC)
Small-scale / informal sector support (including commercial zones)	Trade (50%) Business services (20%) Transport and storage (15%) Real estate (15%)	15%	633.15
Low cost housing	Construction (75%) Sustainable manufacturing (25%)	15%	633.15
Transport infrastructure	Construction (75%) Sustainable manufacturing (25%)	15%	633.15
Renewable Energy (PV)	Renewable energy	15%	633.15
Biogass to electricity	Waste to energy	15%	633.15
Sustainable local manufacturing (including building materials)	Sustainable manufacturing	10%	422.10
Urban agriculture	Fruit and vegetables	5%	211.05
Technology-based urban management	Business services (50%) ICT (50%)	5%	211.05
Waste recycling	Water supply and sewage	5%	211.05
Total		**100%**	**4,221.00**

Table A. 11: Funding allocation in the initial Cities Matter pathway by SAM sector

SAM model Sector	Distribution	('million GHC)
Fruit and vegetables	5%	211
Water supply and sewage	5%	211
Construction	23%	950
Trade	8%	317
Transport and storage	2%	95
ICT	3%	106
Real estate	2%	95
Business services	6%	232
Renewable energy	15%	633
Waste to energy	15%	633
Sustainable manufacturing	18%	739
Total	**100%**	**4221**

Table A. 12: Output change under Standard Industrial Policy and initial Cities Matter pathways (nominal)

Commodity sector	Standard Industrial Policy		Cities Matter	
	% Change	% Contribution to output	% Change	% Contribution to output
c-Cereals	101%	16%	1%	0%
c-Fruit and vegetables	0%	0%	39%	5%
c-Other crops	16%	4%	41%	6%
c-Livestock and livestock products	126%	14%	3%	0%
c-Forestry and fishing	12%	2%	13%	1%
c-Mining	1%	1%	5%	2%
c-Food, beverages and tobacco	140%	45%	1%	0%
c-Textiles, clothing and leather	16%	1%	4%	0%
c-Wood and paper	13%	2%	28%	2%
c-Petroleum	4%	1%	7%	1%
c-Chemicals	18%	2%	9%	0%
c-Minerals and metals	3%	0%	31%	1%
c-Equipment and machinery	320%	1%	6%	0%
c-Other manufacturing	529%	6%	216%	1%
c-Electricity, gas, steam	4%	1%	34%	5%
c-Water supply and sewage	1%	0%	3%	0%
c-Construction	1%	0%	62%	28%
c-Trade	0%	0%	43%	14%
c-Transport and storage	0%	0%	1%	1%
c-Accommodation	0%	0%	1%	0%
c-ICT	0%	0%	4%	1%
c-Finance	0%	0%	27%	3%
c-Real estate	0%	0%	10%	1%
c-Business services	0%	0%	14%	2%
c-Public administration	0%	0%	0%	0%
c-Education, health and other	3%	2%	4%	1%
c-Renewable energy*	4%	0%	422%	1%
c-Waste to energy*	0%	0%	4218%	1%
c-Sustainable manufacturing*	0%	0%	826839%	24%
Total output	**12%**	**100%**	**25%**	**100%**

Source: Own calculations based on: Report on the 2015 Social Accounting Matrix (SAM) for Ghana, Ghana Statistical Services. Source data from: Ghana Statistical Services, 2017, "Social Accounting Matrix (SAM) 2015", http://www2.statsghana.gov.gh/nada/index.php/catalog/95.

** Because these sectors were added to the SAM, and the share of their output was "fixed" to amount for a small percentage of total output, even small investments in these sectors will have a large impact on the increase in output from these sectors.*

APPENDIX 6 STAKEHOLDER ENGAGEMENT

The research benefited from comments received at two Ghana Urbanisation Think Tank meetings. The Ghana Urbanisation Think Tank (GUTT) is an interdisciplinary community of urban thinkers and influencers convened by the Coalition to support urban development through dialogue, knowledge sharing and the development of strategies for improving urban development management (The Coalition, 2019).

Furthermore, interviews with several urban development stakeholders was also undertaken to guide the research. The list of interviewees is provided in the table below.

Table A. 13: Stakeholders interviewed

Prof Stephen Adei	Chairman of the National Development Planning Commission
Dr Felix Addo-Yobo	National Development Planning Commission Deputy Director (Environmental Policy)
Mr Ernest Agyapong	Director, 1D1F Secretariat (Ministry of Trade and Industry)
Prof George Owusu	Professor at the Institute of Statistical, Social and Economic Research, Director of the Centre for Urban Management Studies (University of Ghana)
Prof. Takyiwaa Manuh	Emerita Professor of African Studies at the University of Ghana. Previously Director, Social Development Policy Division, of the United Nations Economic Commission for Africa (ECA)
Mr Sylvanus Kofi Adzomu	Director, Policy Planning, Monitoring and Evaluation, Ministry of Local Government and Rural Development
Mr Aloysius Bongwa	Technical Assistance Team Leader – Ghana Urban Management Pilot Programme
Prof Paul William Kojo Yankson	Geographer and Professor at the University of Ghana, Legon. Specialises in Urban and Regional Development Planning

DNA Economics

Making economic sense of common problems