Food Processing Development in Ghana's Food Value Chain: The Implications for Job Creation and Macroeconomic Dynamics.

"This is a draft manuscript – Not for Distribution."

Abstract

Ghana continues to battle with unemployment, despite significant improvement over the years. The growing population with a significantly large young population brings a different twist to the country's unemployment challenges. The jobs created in the agricultural sector predominantly employ low-skilled workers. With the rising mid-skilled unemployment, the beckoning question that arises is what policy options can generate jobs that can absorb the looming mid-skilled unemployment? Food processing presents an opportunity to address the twin challenges of unemployment and underemployment by creating direct and indirect employment opportunities, as well as utilising modern technology to absorb medium- and high-skilled workers. Is this assertion supported by the economic structure of Ghana? Therefore, this study examined the impact of the food processing industry on employment and macroeconomic outcomes within the Ghana food value chain. Specifically, the study explored the effect of food processing development on employment, the effect on the structure of job creation in terms of skilled and unskilled composition, and the consequential effect on household income distribution and inequality implications. Using the Computerised General Equilibrium Framework, the study established that developing the food processing sector generates a reduction in low-skilled labour and increases the demand for mid-skilled and high-skilled labour. Also, it increases the income levels of the marginalised more than the affluent, thereby contributing to bridging the income inequality gap in Ghana.

Keywords:

JEL Classification:

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"… The study's findings therefore suggest that for Ghana to achieve an optimal blend of increasing household income through increased GDP, the country should adopt a holistic value chain approach, encompassing agricultural development, industrialisation, and service improvement.

The implication of the study's findings is prescribed in some policy recommendations as follows:

i. The country's industrialisation drive should be closely tied to the agricultural sector. That is, policies on industrialisation should focus on agro-manufacturing sectors such as food processing, wood processing, meat processing, agro-input manufacturing, among others.

ii. *The country should prioritise the root, tuber, and export sub-sectors of the agriculture sector to harness the potential of the agriculture sector…"* Ayisi (n.d.)

1 INTRODUCTION

The economic growth pillar of Vision 2057[1]—Ghana's Development Plan—aims to build an industrialised, inclusive, and resilient economy, focusing on macroeconomic stability. private sector development, export-oriented diversification, and investment in infrastructure. To achieve this, Ayisi (n.d.) posits, as stated in the above quote, that Ghana will require a holistic value chain approach that spans from agricultural development through industrialisation to service development. This is against the background that increasing production without a corresponding increase in sectors to absorb this increase would lead to falling food prices due to inelastic domestic demand (Gupta et al. 2018; Grethe et al. 2020).

The development of the food processing sector is a key factor in improving the value chain of agriculture and fostering the structural changes envisioned in the Vision 2057 document. Around the world, food processing has been a linkage between primary food production and other industrial and service sectors of higher value (UNIDO, 2015). It is productive because it minimises the losses incurred after harvesting, adds value by packaging and preserving food, and satisfies consumer needs of quality and convenience. Processing has significantly contributed to job creation, foreign reserves, and rural development in many regions of Asia and Latin America (UNIDO, 2015; FAO, 2021). However, Africa remains behind in this respect, and the proportion of agricultural products remains unprocessed or exported in raw form[2]. This constrains the continent's potential to reap the benefits of value addition and the macroeconomic gains that come with industrial upgrading.

Historically, agriculture has been the primary driver of economic performance in Ghana, with agricultural output contributing nearly 40 per cent to GDP in 1957. However, since then, the proportion has fallen to less than 20 per cent as services and extractives expanded (Aryeetey and Baah-

[1] Vision 2057 is Ghana's Long-Term National Development Perspective Framework (LTNDPF). This framework is a Vision document that reflects Ghana's development aspirations, from which current and future Medium-Term Development Plans are derived. This vision is a long-term framework that aims to transform Ghana into a prosperous, self-reliant nation with a strong role in regional and global affairs. The focus areas of the vision include economic growth, social development, environmental protection, and good governance.

[2] Ghana's crop exports are mainly in raw forms. Figure 1 shows Ghana's main crop export products and the trends in their value.

Boateng 2015). Despite this, agriculture remains the main source of livelihoods and food security, especially in rural areas, and employs a significant portion of the Ghanaian labour force.

Given the symbiotic relationship between agriculture and industrialisation, Ghana has continually sought policies that would enhance productivity and market orientation in the food processing sector. The efforts to integrate primary production with downstream industrial activity are shown in the Food and Agriculture Sector Development Policy, the Planting for Food and Jobs programme, and the One District One Factory initiative, among other initiatives, all aimed towards achieving Vision 2057. However, food processing is still a comparatively underdeveloped field, and agro-processing capabilities of the country are not exhausted (Breisinger et al., 2008; Andam et al., 2020), highlighting both opportunities and challenges.

Job creation remains a critical challenge in Ghana. While the agricultural sector employs significant proportions of Ghana's labour force, the country still faces acute job challenges. First, the jobs created in the agricultural sector predominantly employ low-skilled workers. The Ghana Country Economic Memorandum (2021) document shows that the bulk of jobs in Ghana are in low-productivity and often informal services sectors, creating few mid-productivity and mid-skilled jobs for the country's labour force. Also, the formal sector has not been able to create enough job opportunities to absorb the rising young population that enters the labour market every year. This phenomenon further leads to underemployment and informality (Aryeetey and Baah-Boateng, 2015). Indeed, statistics from Ghana's 2015 Labour Force Survey (GLFS) estimated that more than 70 per cent of jobs at the time were in the informal sector, with over 65 per cent of formal jobs falling within "vulnerable employment". Given the above job creation characteristic, the structural change and urbanisation evolution of the Ghanaian economy have not been engines for growth as they have been in East Asia and other parts of the world, where lower-skilled workers moved from agriculture into modern sectors with higher productivity and the scope to drive innovation and economies of scale

Indeed, the above job challenges remain heightened and may persist without any deliberate actions. According to UN Population Forecasts (UN, 2021), Ghana's population by 2040 is projected to rise to 45 million. The implication is that approximately 10 million Ghanaians will enter the labour force by 2040, given that 58 per cent of the current population is under 30 years old. The foregoing shows that Ghana faces an acute jobs challenge, and responding to this challenge will require generating more and better job opportunities for lower and mid-skilled workers.

Food processing presents an opportunity to tackle the twin challenges of unemployment and underemployment through direct and indirect employment and the use of modern technology to absorb medium- and high-skilled workers. Studies show that small and medium-sized agro-processing firms with access to modern technology and a consistent market can increase employment of highly skilled workers (Afful-Koomson and William, 2015). Moreover, food processing likely engages more women than any other industry, which means it can be an effective tool to achieve inclusive development and gender empowerment.

Aside from contributing to job creation, food processing contributes to the macroeconomic fundamentals of any economy. For example, value addition through processing helps grow the gross

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domestic product, diversifies the economy, and enhances foreign exchange earnings in the form of the exports of semi-processed and processed products (Diao, Hazell & Thurlow, 2010; Amanor, 2019). Similarly, food processing industries drive internal packaging material, machine, and service demand, which subsequently provides multiplier impacts in other industries. Again, the development of the processing sector has a fiscal impact that can broaden the tax base and subsidise the government. Macroeconomically, the presence of a robust food processing foundation may also serve to stabilise prices by ironing out seasonal imbalances in supply and dependence on imports of basic foodstuffs. Such dynamics transform the development of food processing not only into an agricultural or even an industrial issue but also into a macroeconomic policy.

Despite these prospects, food processing in Ghana is characterised by small-scale businesses with low levels of capital intensity and productivity. Therefore, this study is introduced on the premise that the quantitative effect of developing food processing is critically missing in the discourse. Understanding the nexus and its quantitative impact is essential for formulating policies that not only improve food processing but also align with broader aims of sustainable development, poverty reduction, and structural transformation.

As a result, this study examines how the food processing industry within the Ghana food value chain has developed and the impact on employment and macroeconomic outcomes. Specifically, the questions posed are

i. What is the effect of food processing development on employment?
ii. How does food processing development change the structure of job creation in terms of skilled and unskilled composition?
iii. What is the consequential effect on household income distribution and inequality implications

The study adopted the IFPRI RIAPA Computerised Generalised Equilibrium model to evaluate the food processing sector's impact on job creation, household income and macroeconomic variables. The findings from the analysis present food processing as a channel to absorb mid-skilled and high-skilled workers in the economy while providing an avenue to bridge the inequality gap that exists between rural and urban, as well as rich and poor households.

The rest of the paper is structured as follows: Section 2 provides a brief theoretical framework and some empirical support on food processing and job creation; Section 3 presents the methodology adopted for the study. Section 4 presents the results and discusses the findings within the objective of the study. Section 5 summarises the study and provides some policy recommendations.

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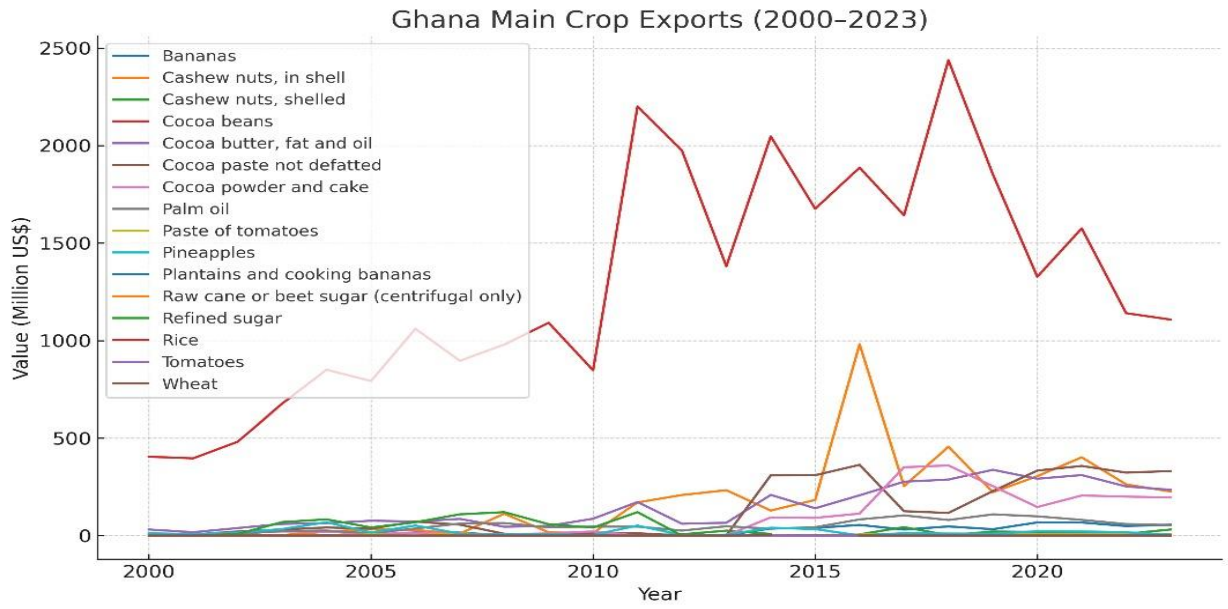

Figure 1: Ghana Main Crop Export (2000-2023)

2 LITERATURE REVIEW

The transformation of Ghana's agricultural sector through food processing development has emerged as a critical pathway for economic growth, job creation, and poverty reduction. This brief review examines the existing body of empirical knowledge on food processing development within Ghana's food value chain, with particular emphasis on quantitative evidence regarding employment generation, skill absorption, household income effects, and macroeconomic dynamics. The review is structured around four key research objectives: (1) job creation through manufacturing sector enhancement via food processing, (2) absorption capacity for low and middle-skilled workers, (3) household income effects and inequality reduction, and (4) macroeconomic implications.

2.1 Employment Multiplier Effects

Empirical studies provide substantial evidence for the job creation potential of food processing development. Haggblade et al. (2016) conducted a comprehensive analysis across 15 African countries, finding that food processing industries generate employment multipliers of 1.8-2.4. Within the West Africa region, their analysis shows multipliers of 2.1 for grain processing and 2.3 for oil processing. In Ghana, Quartey et al. (2018) conducted a firm-level analysis of 250 Ghanaian food processing companies. The study estimated that employment elasticity with respect to output is 0.68, indicating that food processing is relatively employment-intensive compared to other manufacturing sectors (average elasticity of 0.45). Also, Baah-Boateng (2019) surveyed 180 food processing enterprises and estimated that the sector employs approximately 183,000 people directly. The study further estimated that a 10% increase in food processing investment leads to a 7.2% increase in direct employment and a 15.6% increase in total employment when multiplier effects are considered.

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Some studies adopting a time series framework estimate the marginal effect of food processing development. For example, Adu-Gyamfi et al. (2020) analysed Ghana Statistical Service data from 2010-2019, documenting that food processing employment grew at 8.3% annually, significantly outpacing overall manufacturing employment growth of 4.1%. Their decomposition analysis shows that 65% of this growth came from new establishment creation, while 35% resulted from the expansion of existing firms.

Also, Amponsah et al. (2021) used panel data from Ghana's industrial census (2012-2018) to demonstrate that regions with higher food processing investment experienced employment growth rates 2.3 times higher than regions without significant food processing development. Their fixed-effects regression analysis controls for regional characteristics and shows statistically significant employment effects.

2.2 Absorption of Low and Middle-Skilled Workers: Empirical Analysis

Food processing is identified to change the skill composition in labour employment. Tschirley et al. (2015) conducted a detailed occupational analysis across food processing firms in Ghana, Kenya, and Nigeria. Their findings for Ghana show that 62% of food processing jobs require low to middle-skill levels: 28% low-skilled (packaging, sorting, basic processing), 34% middle-skilled (machine operation, quality control, basic maintenance), and 38% high-skilled (management, technical specialists). The above findings were further supported by Baah-Boateng's (2019), which provided empirical evidence on skill absorption patterns in Ghana. The study showed that 71% of workers in food processing enterprises had primary or junior high education, while only 18% had tertiary education. They estimated that food processing firms are 2.3 times more likely to hire workers with basic education compared to other manufacturing sectors.

Also, Aryeetey and Baah-Boateng (2016) analysed labour force survey data (2013-2017) to track worker transitions into food processing employment. The findings show that 45% of new food processing workers came directly from agriculture, 28% from informal services, and 27% were new labour market entrants. This pattern demonstrates the sector's capacity to absorb workers transitioning from traditional sectors. further, Diao et al. (2019) used household panel data from Northern Ghana (2012-2018) to examine employment transitions. Their difference-in-differences analysis shows that areas with new food processing facilities experienced a 23% increase in formal employment among workers with basic education levels, compared to control areas without such investments.

Food processing development is empirically identified to impact skill development and wage progression. Studies such as Amponsah et al. (2021) conducted a longitudinal study of 800 food processing workers over 36 months. The findings show that workers' technical skills, measured through standardised assessments, improved by 34% on average, with corresponding wage increases of 28% over the study period. In Nigeria, Liverpool-Tasie et al. (2020) analysed payroll data from 50 Nigerian food processing firms and found similar patterns, with Ghanaian comparative data showing that workers in food processing experience wage growth rates of 12-15% annually in their first three years, significantly higher than the 6-8% average for manufacturing workers.

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2.3 Household Income Effects and Inequality Reduction: Empirical Evidence

Empirical studies also support the relationship between household income and the reduction of the inequality gap. Using comprehensive household-level evidence, Goedde et al. (2019) conducted an impact evaluation comparing communities with and without food processing facilities across Ghana, Nigeria, and Kenya. In Ghana, the randomised controlled trial design shows that households in treatment communities (with food processing facilities) experienced 18.4% higher incomes compared to control communities over 24 months. Also, Headey and Alderman (2019) used Ghana Living Standards Survey data (2012-2017) to examine household income effects. Their propensity score matching analysis shows that households with members employed in food processing have 22% higher per capita incomes compared to similar households without food processing employment. The effect is strongest for households in the bottom two income quintiles.

For bridging the inequality gap, Quartey et al. (2018), analysing district-level data across Ghana's 216 districts, identified that districts with higher food processing employment ratios have Gini coefficients that are 0.08 points lower on average, controlling for other economic and demographic factors. Also, Reardon et al. (2019) provide comparative evidence showing that food processing development in Ghana's Upper East Region led to a 12% reduction in the Gini coefficient over five years (2013-2018), primarily through increased employment opportunities for middle-income households. This evidence also supports the rural-urban distinction. For example, Baah-Boateng (2019), using spatial analysis techniques to examine rural-urban income convergence, found that districts with significant food processing development experienced 15% faster convergence in rural-urban income gaps compared to districts without such development. The effect operates primarily through rural employment creation and increased agricultural prices due to processing demand.

2.4 Macroeconomic Implications

The macroeconomic effect of a developed food processing sector is well-documented in the literature. Studies such as Diao et al. (2019) used a computable general equilibrium (CGE) model calibrated with Ghana's 2013 Social Accounting Matrix and showed that a 20% increase in food processing capacity leads to 0.7 percentage points higher annual GDP growth, with 60% of the effect coming from direct value addition and 40% from multiplier effects. Other methodologies, such as time series analysis, support food processing as an enabler for GDP growth. For example, Aryeetey and Baah-Boateng (2016), using the Vector Autoregression (VAR) technique with data from 1990-2015, estimated from the impulse response functions that food processing investment shocks lead to sustained GDP growth effects, with peak impacts occurring 3-4 years after initial investment.

Studies also show the effect of food processing on trade balance and export Performance. Amponsah et al. (2021) show that Ghana's processed food exports grew from $180 million in 2010 to $420 million in 2019, representing 8.7% annual growth. Their gravity model analysis indicates that each additional food processing facility increases regional exports by an average of $2.3 million annually. Also, import substitution effects are documented by Quartey et al. (2018), whose analysis showed that increased domestic food processing capacity reduced food imports by $340 million between 2015-2019, improving the agricultural trade balance by 14%.

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Again, there is evidence of inflation and price stability effects (Liverpool-Tasie et al., 2020; Goedde et al., 2019) and government revenue and fiscal impact (Baah-Boateng, 2019; Adu-Gyamfi et al., 2020).

The empirical literature demonstrates substantial and quantifiable potential for food processing development to achieve the research objectives of job creation, skill absorption, household income improvement, and positive macroeconomic effects in Ghana. Despite this, several issues remain. First, long-term panel studies tracking individual workers over extended periods (5+ years) are limited. Most studies cover 2-3 years, potentially missing longer-term career development and income effects. Second, detailed firm-level productivity analysis is lacking. While employment effects are well-documented, empirical evidence on total factor productivity growth in food processing firms is limited, making it difficult to assess the sustainability of employment creation. Third, regional heterogeneity analysis within Ghana is underdeveloped. Most studies provide national-level estimates, but effects likely vary significantly across Ghana's ecological zones and levels of development. Fourth, supply chain integration effects lack a comprehensive empirical analysis. While studies document direct employment effects, systematic analysis of upstream and downstream employment creation is limited.

As a result, this current study aims to estimate the impact of food processing on skill recomposition in its job creation role, household income inequality, and macroeconomic dynamics. The study achieves this using the computable general equilibrium framework. Though Diao et al. (2019 used the CGE framework to study macroeconomic characteristics of the Ghanaian food processing sector, the study calibrated using the 2013 social accounting matrix of Ghana. Again, it did not explore the job creation impact regarding impact on the skill ladder in employment generation. This current study used the 2019 social accounting matrix, which used the 2013 supply-use table that presents more recent structural characteristics of the Ghanaian economy. The findings aim to further strengthen the empirical foundation for food processing development policies in Ghana.

3 METHODOLOGY

3.1 Theoretical Underpinnings

This study relies on the input-output theoretical framework developed by Leontief (1936). This framework models the relationships between different sectors of an economy by examining how the output from one industry serves as an input for another. The framework helps to map the interdependencies among industries and provides insights into how changes in one sector can ripple through the economy, impacting overall production and consumption patterns.

In this study, we evaluate how development in the food-processing sector impacts job creation and the macroeconomic goals of growth and production, among others. We achieve this when the food-processing sector combines labour and capital with high shares of intermediate inputs from agriculture. Therefore, food-processing development in agriculture-based economies would work through an input-output linkage via both backwards multiplier effects and forward multiplier effects.In the backwards effect, agriculture value-addition is created through processing, creating jobs

and returns on capital (Miller et al. 2019; Nassirou Ba 2016). Within the forward multiplier effects, the additional value-added generates demand and hence fosters economic growth at the macro-level and contributes to livelihoods at the household-level (Miller et al. 2019; Nassirou Ba 2016; van Melle, Coulibaly, and Hell 2007).

3.2 Theory of Change

The transmission of food processing development to job creation and macroeconomic outcomes is captured directly and indirectly through various channels. For job creation, food processing development ensures investments in food processing infrastructure, technology, and value chain development, which causes increased demand for processed foods, creating jobs in processing, packaging, and distribution, as well as for farmers and workers in related support services. On a spatial balance, this cycle boosts rural economies, enhances food security, and fosters entrepreneurship by providing technical skills, financial support, and market access to actors in the food system.

The pathway linking food processing to macroeconomic outcomes is mapped from increased food processing activities to impact job creation, increased exports, higher GDP, improved food security, and greater economic stability. It begins with investment in processing and R&D as inputs, which generates processed outputs, creating short-term outcomes such as higher incomes for farmers and related jobs that consequently drive medium-term outcomes (increased industrialisation, better resource utilisation) and long-term impacts on macroeconomic indicators like national GDP, trade balances, and overall economic growth.

3.3 The Model

The study adopted the IFPRI static, single-country, open-economy CGE framework for the analysis. The framework captures the interactions between households, firms, the government, and trade, ensuring that economic activities remain consistent with real-world constraints. The model uses a two-level production structure that combines two different ways of handling inputs. At the first level, firms combine intermediate inputs such as raw materials, electricity, fuel and value-added – labour and capital – in fixed proportions. Under this technology, inputs cannot be substituted for one another. At the second level, production uses Constant Elasticity of Substitution (CES) technology to combine labour and capital. The nested Leontief-CES setup helps capture both the fixed needs of production, such as raw materials or fuel, while enabling flexibility in choosing labour or capital in response to price changes. This modelling approach allows the model to reflect realistic business behaviour, balancing technical constraints with market responses (Gilbert, 2014; Arslan & Hatipoğlu, 2012).

Household consumption is modelled using a Linear Expenditure System (LES), which differentiates subsistence needs from discretionary spending (Nganou, J.-P., 2005). This formulation facilitates the analysis of welfare impacts across different income groups, as it reveals how households adjust their consumption patterns in response to price changes caused by taxes.

The behaviour of the agents is summarised as follows: the government collects revenue through direct taxes and indirect taxes and uses the accumulated revenues to influence public savings, expenditure policies, and fiscal sustainability. Consumers and producers maximise utility and profits based on

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factor and product prices, which adjust endogenously to establish market equilibrium. Trade behaviour in the model is represented by using Armington functions for import demand and Constant Elasticity of Transformation (CET) functions for export allocation. These functions assume that domestic and foreign goods are imperfect substitutes, reflecting real-world trade behaviour (Lofgren & Cicowiez, 2018). Population growth and urbanisation are set exogenously, affecting labour supplies, while sectoral capital accumulation is endogenously determined based on past investments. The detailed structure of the RIAPA model can be found in Benfica and Thurlow (2017) and thoroughly documented in Lofgren et al. (2002) and Robinson and Thurlow (2004).

The model is calibrated to reflect the Ghanaian economy using the 2019 Social Accounting Matrix (SAM) of Ghana. The 2019 SAM used the 2013 supply and use table (SUT), the most recent for Ghana. The 2013 SUT provided information on the breakdown of public consumption spending across public administration, health and social work, and education. This was updated using GDP estimates for public administration, education, and health in the national accounts. In disaggregating the SAM, data from FAOSTAT and gross output values for manufacturing subsectors from Ghana's Industry, Business and Enterprise Survey were utilised. Further, the 2016/17 Ghana Living Standards Survey (GLSS7), which is a nationally representative household data, was used to disaggregate total private consumption spending across activities and commodities.

We employed the above information to study the impact of food processing development on job creation and selected macroeconomic outcomes.

3.4 Scenario

A scenario with increased food processing is compared to the base, representing the status quo in Ghana in 2019. In the scenarios, we simulated an increase in food processing by processing 50 per cent of Ghana's domestically produced foods.

4 RESULTS AND DISCUSSIONS

The section presents the scenario results and discusses their implications for the country's development goal. The impact outcomes considered are job creation, macroeconomic outcomes such as GDP growth, CPI, and absorption, and household income.

4.1 Macroeconomic effects

Increasing food processing generates an increase in absorption by about 0.98 per cent, with both export and import increasing by 0.98 per cent and 0.94 per cent, respectively (Figure 2). Although the increase in imports may seem counterproductive in terms of the intervention's ability to reduce importation (Amponsah et al., 2021), the result indeed reflects the structural characteristics of the processing industries. The processing sector depends heavily on imported inputs for its activities. Therefore, increasing production demands high inputs to sustain the growth in the industry, hence the high import value. Notwithstanding this, consistent with Quartey et al. (2018) and Amponsah et al. (2021), the net export increased by 0.04 per cent, suggesting that intervention in the processing sector indeed increased the country's export value.

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Also, we identify the effect of the intervention on prices. The results reveal that the impact of food processing development on prices is heterogeneous. While agricultural goods prices increased by 4.33 per cent, industrial goods prices decreased by 1.03 per cent. Also, processed food prices decreased by 13.47 per cent. Overall, the consumer price index reduced by 0.26 per cent, suggesting the potential of processing development to reduce inflation. This finding is consistent with studies such as Goedde et al. (2019) and Liverpool-Tasie et al. (2020). Goedde et al. (2019) used cointegration analysis to examine long-term price relationships, finding that food processing development helps stabilise agricultural commodity prices, reducing seasonal price variations by 22% on average. Similarly, Liverpool-Tasie et al. (2020) analysed monthly price data from 45 Ghanaian markets (2012-2019) to examine food price volatility. Their autoregressive conditional heteroskedasticity (ARCH) models show that markets in regions with developed food processing infrastructure experience 28% lower food price volatility compared to regions without such infrastructure. Though the above studies show evidence in a partial framework, the finding from this current study shows that food processing development can stabilise aggregate prices and consequently stabilise inflation.

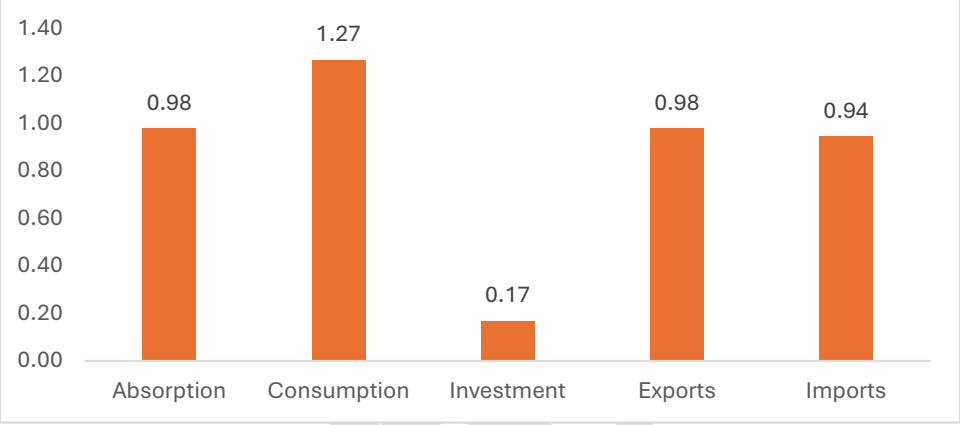

Figure 2: Macro component Impact

Sectorally, food processing development causes all crops to increase except for the root and tuber, vegetable, and fruit sectors, which decreased (Figure 3). Also, the intervention causes the export sector to increase. The increase in non-traditional export crops outweighs that of the traditional export crops. The findings suggest that food processing can contribute to crop export diversification beyond the traditional cocoa and coffee.

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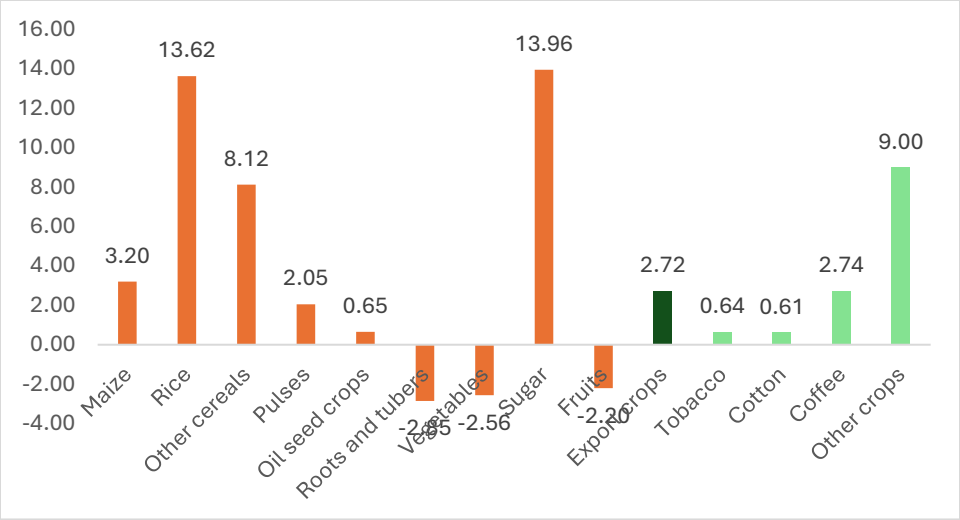

Figure 3: Impact on the Crop Sector

4.2 Job creation

The base structure of the economy shows that the agricultural sector employs approximately 75 per cent of low- and semi-skilled workers in the economy. The distribution in terms of the sector-specific employment of low- and semi-skilled workers is presented in Table 1. The cereal and root sector is the highest employer of low-skilled workers, accounting for approximately 43 per cent. This is followed by the export crop sector, which accounts for approximately 12 per cent. The horticulture sector employs the least of low-skilled workers, accounting for about 0.3 per cent. The non-agricultural sector employs approximately 25 per cent, with the food processing sector employing about 3 per cent of the low-skilled workers.

On the contrary, the non-agricultural sector employs most of the medium- and high-skilled workers, accounting for about 75 per cent, whereas the agricultural sector employs 25 per cent. The industrial sector accounts for about 14 per cent of medium- and high-skilled workers, with the processing sector employing about 2 per cent.

Another important characteristic of the Ghanaian economy's base job structure is that employment in the economy is predominantly informal. GSS, through the Labour Market Survey, estimate that more than 80 per cent of Ghanaian employees are working in the informal sector[3]. The occupational distribution of most of the informal employment is the agriculture/fishery sector, craft and related trades activities, and services/sales activities, accounting for 55.1 per cent, 13.4 per cent, and 13 per cent, respectively.

Expanding the food processing sector changes the job structure of the economy. Food processing intervention decreases demand for low- and semi-skilled workers by 6.38. The reduction in low-skilled

[3] Informal sector employment is defined as employment that is not covered, or is insufficiently covered, by formal arrangements through work, such as contributions to pensions and medical insurance or entitlement to paid sick leave or annual leave. Within the informal employment, self-employed account for about 55.9 per cent, family enterprise employment accounts for about 20.4 per cent, and wage employees account for 17.6 per cent.

demand translates into an increase in demand for medium- and high-skilled labour. Given that most of the informal employment operates in the agriculture sector, the shift in demand for skilled workers consequently shifts workers into formal employment.

Table 1: Base Structure of Sector Employment

		Unskilled & semi-skilled	Medium- & high-skilled
Agriculture		**74.72**	**25.21**
	Cereals & root crops	43.50	11.17
	Pulses & oilseeds	7.67	2.12
	Horticulture & tree crops	0.32	0.55
	Export, other crops & forestry	12.94	8.80
	Livestock & fisheries	10.29	2.56
Non-agriculture		**25.28**	**74.79**
Industry		**9.20**	**14.17**
	Extractive industries	1.74	4.31
	Food processing	3.33	1.26
	Other agro processing	0.31	0.13
	Other manufacturing	3.34	5.54
	Metals, equipment & vehicles	0.02	0.17
	Construction & utilities	0.46	2.76
Service		**16.08**	**60.62**

4.3 Household Income Distribution

The policy intervention has a positive impact on the incomes of all household categories. Figure 4 shows that the quintile with the least impact even increased by about 0.4 per cent, with the highest increase approximating 3 per cent. The distribution of the income increases shows that the marginalised in the economy benefit significantly from improving the food processing sector. For example, whereas the poor household's income increases by about 2 per cent, the rich household's income rises by about 1 per cent.Similarly, rural households' income increased by 1.5 per cent above that of the urban households. Again, we observe a similar trend within the various quintiles, as shown by an upward trend in income in favour of the lowest quintiles.

The above results imply that food processing serves as a channel to close the income gap among marginalised groups. Ghana faces significant income inequality, with extreme disparities between the richest and poorest and persistent gaps based on gender, urban-rural divides, and regional differences. A substantial spatial gap exists, with rural dwellers earning significantly less than urban dwellers, causing rural poverty to remain much higher than urban poverty. Statistics from the Ghana Statistical Service (GSS) estimate that inequality measured by the Gini coefficient increased from 41.9 per cent in 2005/2006 to about 42 per cent in 2017 GLSS7. Therefore, the results show that food

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processing can reduce the spatial disparities in income and help bridge the existing gap between groups.

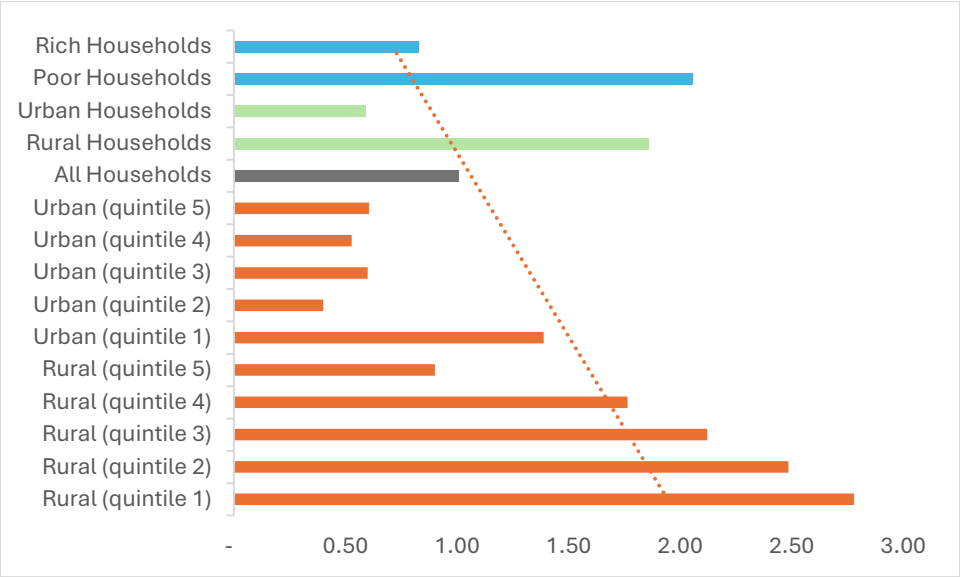

Figure 4: Household Income Impact Distribution

5 CONCLUSION AND POLICY RECOMMENDATION

This study was commissioned to evaluate the impact of food processing development on job creation, household income, and macroeconomic dynamics. Specifically, the study answered the following questions. What is the effect of food processing development on employment? To what extent and how does food processing development change the structure of job creation in terms of skilled and unskilled composition? What is the consequential effect on household income distribution and inequality implications?

The results for the Ghanaian case show that food processing development generates an increase in overall demand for jobs, providing evidence to support the job creation ability of the sector. Again, developing the food processing sector creates less demand for low-skilled labour while creating demand for mid-skilled and high-skilled labour. Again, the results indicate that while the intervention generates a positive impact on all categories of households, the impact on the poor and rural households outweighs that of their respective counterparts, rich and urban households.

In view of the findings from this study, the following recommendations are prescribed. First, Ghana should intensify the implementation of the One District One Factory (1D1F) program targeting food processing, such as sugar, palm, staple foods such as cassava, and others.

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