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**Factors Affecting
Cement Supply and
Prices in Tanzania**

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Abstract

The study investigates factors, which affect cement supply and prices in Tanzania, employing an interview-based approach supplemented by secondary data analysis. In gathering primary data, both purposive and snowball sampling techniques were employed, largely covering the supply and demand sides of the cement industry. The findings indicate that cement supply challenges in Tanzania are to a large extent due to domestic production constraints as cement export and import play a very small role. Factories generally match cement production with demand. This tendency contributes to the intermittent shortage of cement supply in some parts of the country followed by price hikes when other constraints come into interplay as observed in 2009-2015, 2019-2020, and 2020-2021 periods. Respondents indicated that the constraints relate to, among others, availability of raw materials including clinker, energy supply, technology gap, transport and logistics, spare parts and skills availability. When inquired to indicate factors that drive cement prices in the country, the respondents' underscored: supply-side factors such as cost of raw materials, power supply, transport cost, and seasonality; policy and regulatory factors including taxes, levies and charges; and industry-wide factors particularly, incomplete information about demand, dishonest traders, and competition aspects.

Mindful of the ongoing mega projects that are anticipated to lessen some of the cited constraints including the Julius Nyerere Hydropower Plant, Standard Gauge Railway, and construction of tarmac roads to link all regional centres in the country, the study underscores the need to encouraging cement producers to build depots along the new rail line (SGR) to facilitate distribution of cement at a lower cost upon its completion; fastening connection and supply of natural gas to cement plants to reduce the cost of production and attract new investments in the industry; fast-tracking the implementation of measures proposed in the blueprint to reduce the cost of compliance with government regulations and streamlining revenue collection to avoid double-taxation. In addition, the responsible ministry should closely monitor developments in cement prices and intervene where necessary using market-based measures. The Fair Competition Commission (FCC) should follow up on developments in the cement industry to deter the possibility of collusion or cartel formation or any other anti-competitive conduct to avoid unfounded shortages and price hikes.

1.0 Introduction

Globally, the cement industry has experienced rapid growth mostly in response to demand fuelled by economic growth, urbanization, and population growth, especially in emerging market economies dominated by China. In the decade of 2020, for example, cement production was estimated at 4.1 billion tonnes in 2020 up from 1.4 billion tonnes in 1995 with China accounting for 54 percent of the world production. In Africa, production rose to 258 million tonnes in 2019 from 44.95 million tonnes in 2009 (Birch, 2019).

Tanzania has not been left behind in this race. Indeed, the industrial sector development has been an integral part of Tanzania's development agenda since independence, with the cement industry being one of the strategic sub-sectors. The first cement factory commenced operations in 1966, and the number has since then increased reaching 13 factories in 2020, following the liberalization measures started in the second half of the 1980s to address supply gaps and the need to respond to demand in the construction of physical and social infrastructure and for job creation and revenue enhancement. As a result, cement production in the country has been increasing reaching 6.5 million tonnes in 2020 compared with the estimated domestic demand of 6.7 million tonnes (see, National Bureau of Statistics Report of 2021).

Despite the increase in production, regular shortages of the product in the domestic market have been reported while huge price hikes have occurred in some parts of the country leading to outcries by consumers. In the picture are the 2009/2015 and 2019/2020, 2020/2021 periods, where cement shortages and large price hikes were reported across the country leading to government intervention. African Competition Forum (2014), Mbongwee et al. (2012), Martin (1993), Ball and Romer (1990), and Ginsburgh and Michel (1988) for example, suggest that such phenomena could be a product of a combination of factors including supply-demand mismatch, firm- and industry- level factors, and regulatory related constraints.

Which of these factors could be applied to Tanzania is a research issue. The current study seeks to contribute to this with a view to informing policy decisions in addressing challenges related to cement supply shortages and price hikes. The overriding objective is to investigate factors, which influence cement supply and prices in Tanzania. The investigation is anchored on three research questions. What are the trends in cement production in relation to the industry's installed capacity in Tanzania? What are the key driving factors for the observed trends in cement production? What are the factors influencing cement prices?

Apart from the introduction, Section 2 reviews the literature on the cement industry, followed by the description of the methodology in Section 3. Discussions of the findings are captured in Section 4, while Section 5 provides concluding remarks and with policy recommendations.

2.0 Literature Review

2.1 Theoretical Context

The conjectural underpinning cement price determination hinges on the standard supply and demand theories. In this, a mismatch in supply and demand may lead to a price increase if there is an under-supply of or higher demand for a good, while a decrease in price results if there is an over-supply of or lower demand for the good. Supply of a good may be influenced by factors such as the good's own price, prices of related goods, conditions of production, expectations, price of inputs, number of suppliers, government policies and regulations, and seller's willingness or ability to produce and sell the good. Relevant on the demand side include average levels of income, size of the population, availability of related goods, nature of the good, individual tastes and preferences, consumer expectations about future prices, income and availability.

According to the cost of production theory of value, market value market price are equal only under conditions of market efficiency, equilibrium rational expectations. Also, returns to scale economics of scale are related terms that described what happens as the scale of production increases. In other words, the cost of production determines the market price of any commodity, which is driven by the consumers. The labour theory of value may also be relevant. Under this, labour theories of value are theories in economics according to which the true values of commodities are related to the quality and quantity of labour required to produce them. According to Lafarge Cement (2009), inadequate infrastructure continues to be the industry's scourge. Manufacturers are burdened with high costs for power, fuel, transportation, and water security, which raise the cost of production and raise cement prices.

Furthermore, tax subsidy theories provide a more helpful justification for the high price of cement. This explains how different taxes and subsidies affect the pricing of commodities. Taxes and subsidies affect how much products and services cost. If all other factors are equal, a marginal tax on producers or sellers of a good will cause the supply curve to shift to the left until the vertical distance between the two supply curves equals the per unit tax, which will increase the price that consumers pay and decrease the price that sellers receive in terms of decreased demand. When production receives marginal subsidies, the supply curve will move to the right until the vertical distance between the two supply curves is equal to the per-unit subsidy. If all else is equal, this will result in a decrease in consumer prices and an increase in producer prices due to higher demand. In other words, taxes and subsidies have the power to influence how consumers behave in order to obtain the utility value of their purchases of goods and services.

Worth noting is that price stickiness may occur, largely contributed by the market-level degree of competition (Ginsburgh & Philippe, 1988), Martin (1993) and Domberger (1979). Contract and cost-based theories may as well explain this. In underwritten contracts, firms cannot raise or lower prices for existing clients without any contract renegotiation even under cost shocks or demand shocks (Carlton,

1979). As for the cost-related theories as elaborated by Ball and Romer (1990), price rigidity among other things depends on whether the benefit of nominal price change outweighs the costs.

2.2 Empirical Review

The empirical literature on cement supply and prices underlines the importance of most of the above-mentioned demand-supply factors, with supply-related aspects such as location, cost of production, competition and regulation featuring high.

The location of the factory matters since cement is largely a homogeneous product with relatively low value and high weight thus it helps in minimizing costs of production and prices (African Competition Forum, 2014 and IFC and Institute for Industrial Productivity, 2014). With this, many cement plants are located close to ports, railway lines and major roads, to allow for smooth importation or acquisition of inputs, and transportation of cement products to potential customers. In the same vein, usually plants are located near places full of raw materials such as limestone deposits (Lim et al., 2020).

Other important factors tested to have an influence on cement supply include production scheduling, plant operations and maintenance, product quality, energy consumption, and effective resource utilization--USA (Coito et al., 2005); effective management, optimum capacity and resource usage, infrastructure facilities, and optimized labor resource extraction--India (Muthukrishnan, 2011); energy use, production planning, and technology--Iran (Avami and Sattari, 2007); cutting down wastes and non-value-adding processes and working capital management--Bangladesh (Saifuddin et al. 2013 and Hoque et al. 2015).

According to African Competition Forum (2014), if competition laws are enforced properly, this may help stabilize the prices of cement products. This is because the laws prohibit any conduct by cement producers that can lead to fixing prices in a manner that puts consumers in a disadvantageous position. For instance, the South African Competition Commission (SACC) abolished the use of the Twycross pricing model, as it contravened fair competition values. Cement prices in the Southern African Customs Union (SACU) region stabilized thereafter.

In a nutshell, many factors may explain cement supply and price fluctuations and they vary across countries. Known to us, there is no formal empirical study done on Tanzania.

3.0 Methodology

In addressing the study objectives, it is important to understand the cement supply chain to aid sampling and analysis owing to the inherent high fixed-cost burden and logistics requirements (Gnanapragasam, 2010). In general, the cement supply chain in Tanzania is perceived to involve four stages: extraction of raw materials largely limestone; adding value to the raw materials to get clinker; adding additives to clinker to produce various types of cement; and packaging and distribution of cement products to consumers.

Limestone is largely obtained locally, while clinker may either be imported or produced locally. International companies which are the major producers of cement may import clinker from sister companies as proposed by African Competition Forum (2014). As for reaching consumers, transport and distribution logistics of cement products are assumed to use four channels: depots owned by cement producers, dealerships, direct supply from the cement plants to big customers, and retailing. While depots could be owned by cement producers or subsidiary companies, dealership involves contractual agreements between cement producers and trading companies to supply the products. All three channels charge ex-factory or wholesale prices. The last but perhaps less significant channel involves retailers. Retailers purchase cement from dealerships or depots and supply it to smaller customers.

This study applied an interview-based approach to collect primary data from selected respondents in the four supply chain nodes. This was supplemented by descriptive analysis of secondary data obtained from various sources. This approach was widely used in other earlier studies including Azad et al. (2015) and Pronob et al. (2020).

3.1 Sampling Techniques and Sample Size

In gathering primary data, both purposive and snowball sampling techniques were employed, largely covering the supply and demand sides of the cement industry. From the supply side, 11 out of 13 cement producers were surveyed together with selected cement distributors/agents and wholesalers/retailers as shown in Table 3.1. As for the demand side, checklist questions were used to collect information from large consumers of cement in the country, including selected mining companies, construction companies and government institutions dealing with construction activities. Interviews were confined to eight regions namely, Dar es Salaam, Dodoma, Arusha, Mtwara, Pwani, Kilimanjaro, Tanga and Mbeya, largely selected based on the distribution of cement factories and the need to capture representative views about cement consumption across the country. **Appendix I** provides a summary of respondents by regions in which Dar es Salaam, the country's commercial hub, had the most respondents.

Sample size

Sample size calculation was based on the unknown population and purposive sampling for cross-sectional studies. The sample size was calculated with a 10% estimated proportion of the study variable with a 95% confidence level and non-response rate of 10% using the following formula.

$$n = (Z^2 P(1-P))/D^2,$$

where n= required sample size

Z= confidence level at 95% (standard value of 1.96)

P= estimated proportion of the study variable of 10%

D= margin of error or uncertainty as a fraction of the quantity of interest for this study which is 5% (0.05)

$$n = ((1.96)^2 (0.1) (0.9))/(0.05)^2 = 138.29 \approx 138$$

The sample size was further increased by 10% to account for contingencies such as non-response. The sample size was estimated at $138 + 13.8 = 152.8 \approx 153$.

Table 1.1: Sample size

Group	Sample size
Suppliers	
Cement producers (Attached in appendix 1)	11
Distributors/ wholesalers/ agents/ retailers	115
Final consumers	
Mining Companies (GGM, Twiga, STAMICO and Shanta)	4
Construction companies	20
Government institutions (Ministry of Works and Transport, TANROAD, TANESCO, NHC, Watumishi Housing, JKT)	6
Total sample	156

3.2 Data Collection Approach

A structured questionnaire was used to collect primary data from manufacturers and traders, while checklist questions guided discussions with key ministries, government institutions, and construction and mining companies¹. Interviews were administered face-to-face to allow for follow up questions. Secondary data were collected through the review of company reports, policies, and regulations, as well as published data from different sources.

¹ Questionnaires and checklist questions are attached as Appendix IV-VII.

3.3 Data Processing and Analysis

Data entry was deployed on Open Data Kit (ODK) application and transferred to Stata software version 13 for analysis. The study findings and discussions follow hereunder, largely based on the research objectives.

4.0 Study Findings and Discussions

4.1 Cement Industry Value Chain in Tanzania

Before discussing factors, which affect cement supply and prices, we trace the cement value chain in Tanzania. Understanding this could as well be the basis of any meaningful cost and price minimization efforts.

The value chain of the cement industry in Tanzania is depicted in **Figure 4.1**. The value chain starts with the extraction of raw materials, largely limestone from quarries mostly located in regions along the Coast of the Indian Ocean, including Tanga, Lindi, Pwani and Mtwara². Limestone is usually obtained from firms' own quarries, and some are purchased from small-scale miners. Processing of limestone produces clinker, which is a key intermediate input in cement production. Upon cooling, gypsum is added to control the rate of hardening the cement. In Tanzania gypsum is available in Lindi, Tanga, Dodoma, Kilimanjaro and Singida. Gypsum is usually supplied by mining companies and small-scale miners and transported by road to cement factories. As it will be discussed later, most of the clinker is produced domestically largely by cement companies and transported by road to production plants for final processing to produce cement.

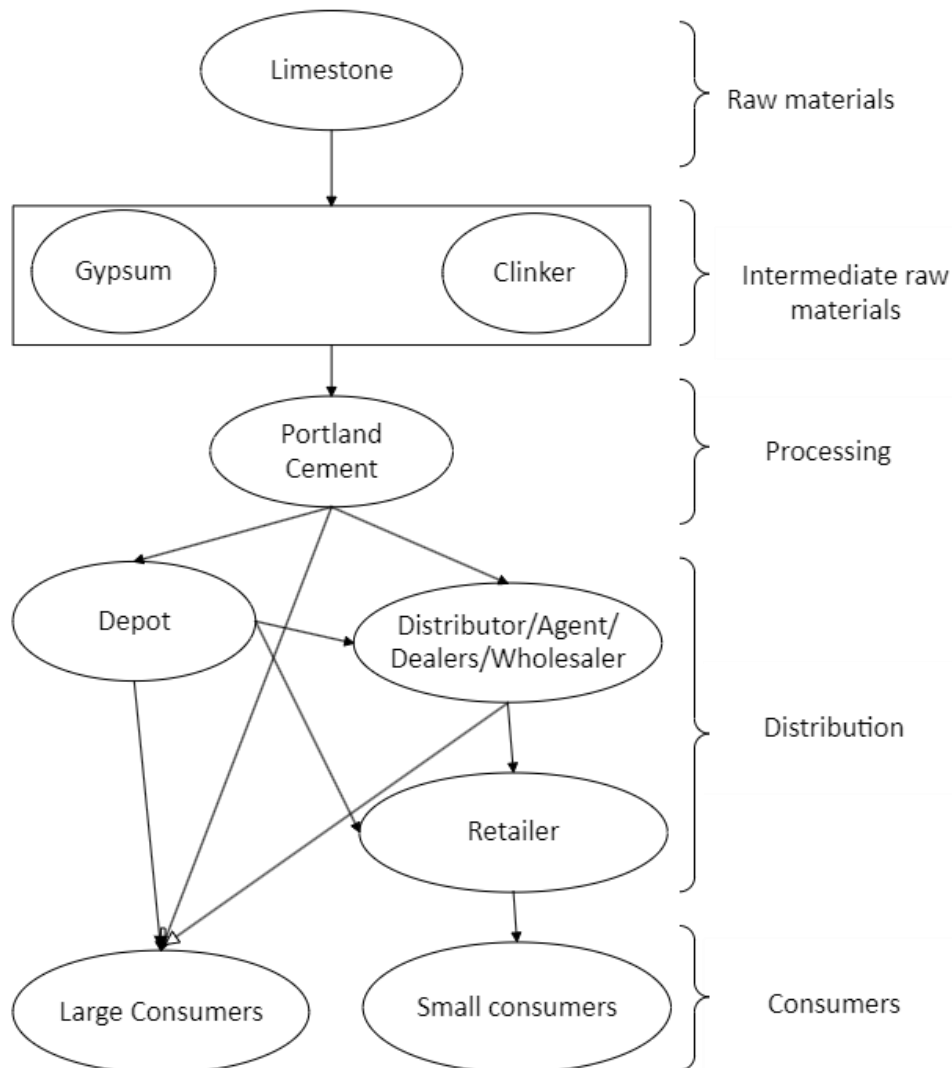
The cement is then distributed to consumers through various channels, in which transportation and distribution logistics are key elements. Field results suggest that distribution channels vary among cement companies. The most common channels involve the use of producer's own depots, dealership arrangements, subsidiary companies, and direct supply to wholesalers. Traditionally, depots are often owned and operated by cement-producing companies. Depots often offer cement at ex-factory or wholesale prices, at a lower price than the retail market. Direct sales to consumers are usually feasible with large-scale consumers such as large construction projects that require substantial amounts of cement in bulk. Dealership arrangement is also another distribution method normally regulated by exclusive agreements between producers and firms doing the business. Dealers add a margin on price to cater for transport and other operational costs, as well as profit.

The cost to final consumers can as well be affected by the mode of cement transportation. Roads are widely used mode of transport due to limited coverage or efficiency constraints of the existing railway

² Other regions where limestone is available include Ruvuma, Kigoma and Morogoro.

system. Respondents were of the view that improving the railway system could reduce costs through the exploitation of economies of scale.

Figure 4.1. Tanzania cement value chain



Source: Authors' construction based on field findings April 2020

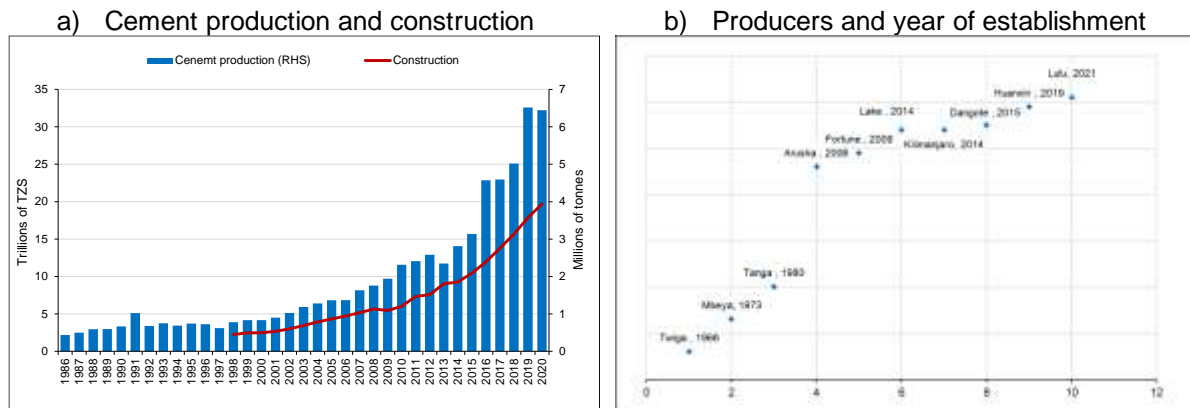
4.2 Cement Supply and Factors Influencing Production

As indicated earlier, in analysing price movements for any good or service, the starting point is to evaluate its supply. This is because any mismatches between supply and demand may *ceteris paribus* contribute to price volatility.

Viewed from 1985, two phases are evident in the domestic cement production trend. During 1985 to 2005 period, the annual volume of cement production was less than 1.4 million tonnes (**Figure 4.2a**). Only three cement factories operated in this period, partly reflecting the monopolistic tendencies of the then state-control policies. Production generally improved since then, consistent with the increase in construction activities and liberalization measures that started in the second half of the 1980s. With the

liberalization, the number of cement factories rose from just 3 in 2006 to 13 factories³ in 2020 (**Figure 4.2b**).

Figure 4.2: Cement production, construction, and number of producers



Note: Source: National Bureau of Statistics and Field findings, February 2021
RHS means right hand scale

Dangote's entry to the market in 2015 changed the scenery as it brought with it an installed capacity of 3 million tonnes per annum and the ability to produce 2.25 million tonnes of clinker per annum. This contributed significantly to cement production, which increased to 6.5 million tonnes in 2020 from 2.8 million tonnes in 2014. The level of production is slightly above the estimated demand of 6 million tonnes exposing the industry to price changes in the event of supply and demand shocks.

During the period of 2000 to 2020, about 6.9 percent of the total cement supply in the country was imported, while for the four years to 2020, the share of imports was less than 3 percent. This implies little reliance on cement imports, with a peak of 796,226 tonnes imported in 2013 (**Figure 4.3a**). The low share of imports suggests that the driver of domestic cement prices is mostly domestic supply.

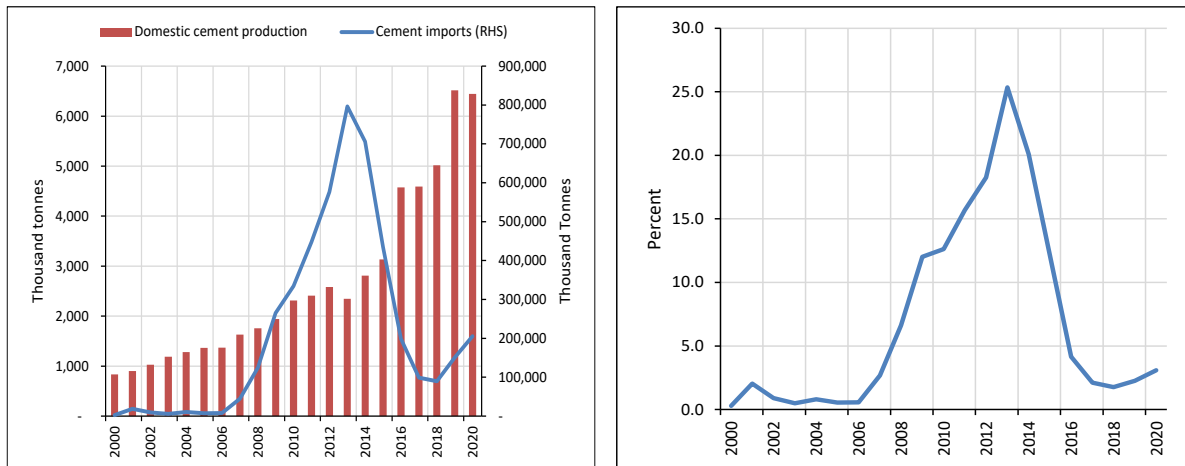
Large import volumes were observed between 2009 and 2015 when the government allowed cement imports to cover deficits which caused soaring cement prices during that period (**Figure 4.3b**). According to African Competition Forum (2014), the increase in prices during the period was associated with a supply-demand mismatch due to internal production capacity constraints and the quest for supernormal profits by untrustful traders. Imports declined substantially after 2016 when import restrictions were reinstated to protect domestic producers. Excise duty on cement imports was raised to 35 percent from 10 percent after the request was made by cement producers through the Tanzania Arm of East Africa Cement Producers Association (EACPA) ⁴.

³ Of the 13 factories only 11 were in operation during the time of the survey.

⁴ Simba Cement (2016) Audited Financial Results for Year Ended 31 December 2016

Figure 4.3: Cement imports and production

- a) Cement production and imports (tonnes) b) Share of imports in cement supply(percent)

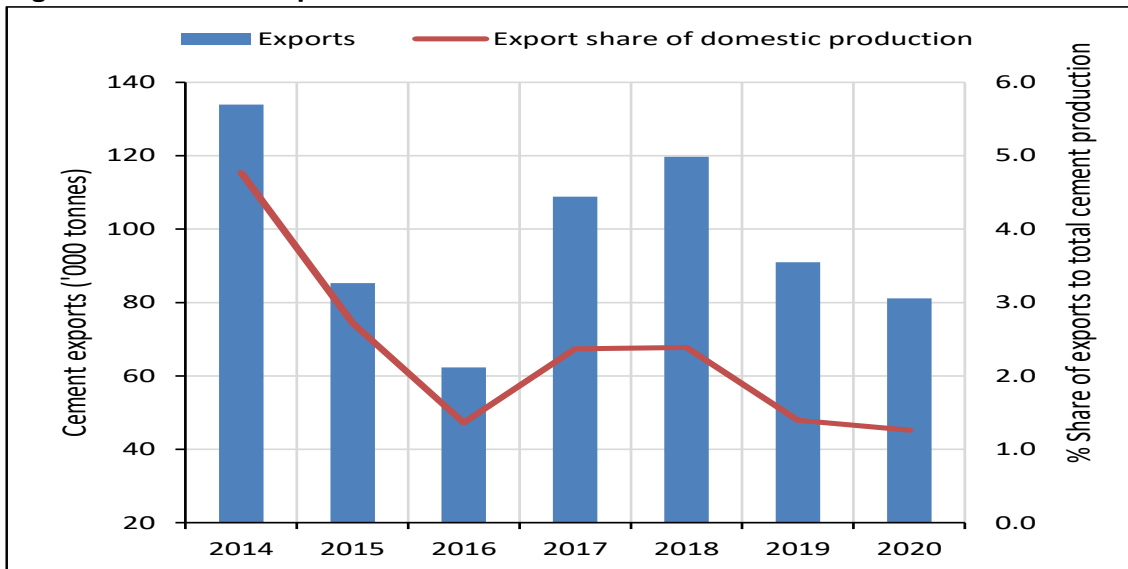


Note: RHS means right hand scale

Source: Tanzania Revenue Authority and Bank of Tanzania Computations

Available data indicate that the export of cement is still low in Tanzania. As shown in **Figure 4.4** the share of cement exports averaged 4.8 percent between 2016 and 2020. The share of exports declined to 1.3 percent in 2020 from 4.8 percent in 2014, probably suggesting low pressure on domestic cement supply and prices (**Figure 4.4**). Some of the interviewed firms indicated that they export cement, though at varying degrees, including to Rwanda, Burundi, Zambia, Mozambique, and the Democratic Republic of Congo. Most of the exported cement originates from factories located in border regions.

Figure 4.4: Cement exports



Source: Tanzania Revenue Authority and Bank of Tanzania Computations

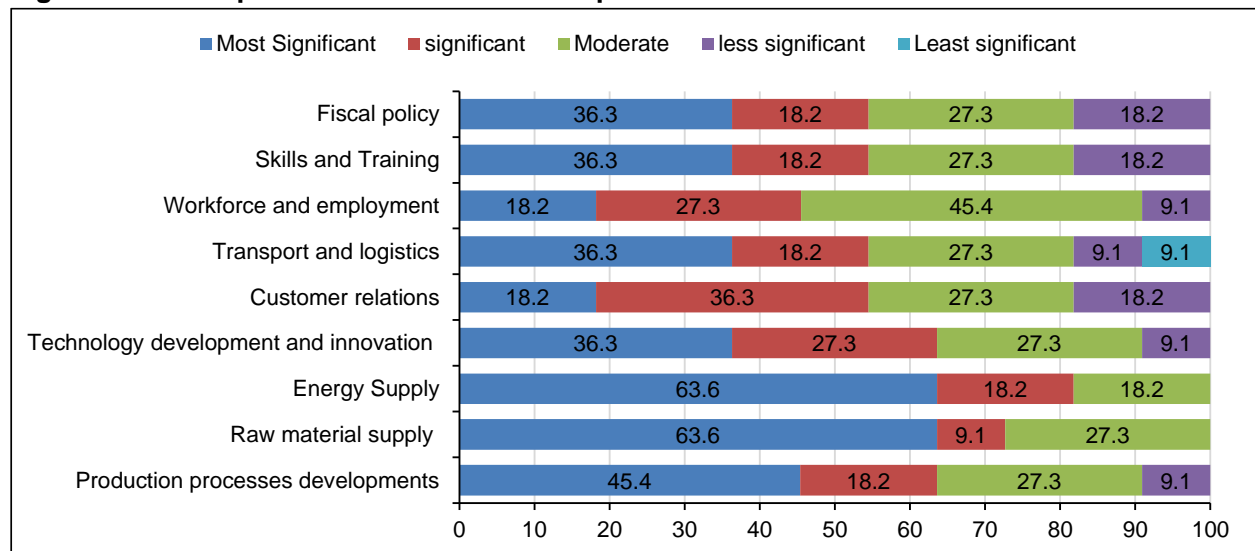
Perception about Factors Influencing Cement Production

Capacity Utilization

The installed cement production capacity is estimated at 10.4 million tonnes⁵ per annum⁶. Discussions with producers revealed that the industry operates under capacity; only 63.1 percent of the installed capacity is utilized. Specifically, out of eleven operating cement factories, only two could utilize more than 90 percent of the installed capacity, while three factories were operating below 50 percent of the installed capacity. Of the three big producers only Tanga and Twiga cement companies were producing above 80 percent of the installed capacity, while Dangote Cement Company was operating below 35 percent of the capacity mainly attributed to energy constraints.

Producers highlighted a number of factors that influence cement production in the country. They include expansion in construction activities (demand), availability of raw materials, power, proximity to the market, transportation, and skills aspects (**Figure 4.5**).

Figure 4.5: Perception on drivers of cement production



Source: Field findings, February 2021

Availability of Raw Materials

Availability of raw materials is one of the most important factors. This explains why most of the plants are located near areas with large deposits of limestone as well as reliable transport to help minimize costs. Most of the raw materials (limestone in particular) are found along the Indian Ocean coast, where most of the plants are located; this makes it difficult to reach markets in the rural areas owing to the vast size of the country and limited economies of scale modes of transport.

Six out of eleven operating firms produce clinker. These are Huaxin, Dangote, Lake, Tanga, Mbeya, and Kilimanjaro cement factories, which produced 3.8 million tonnes of clinker in 2020. This is

⁵ The level is lower than that of Kenya with installed capacity of 13 million tonnes per annum.

⁶ <https://constructionreviewonline.com/concrete/cement-production-in-africa-and-pricing-and-trends/>

equivalent to 58.8 percent of total cement produced in the country, pointing to underreporting of actual clinker production based on the fact that generally, clinker constitutes over 95 percent of OPC.

It was indicated that most of the clinker used for cement production is sourced from the domestic market. Some producers perceived it to be of high price relative to the imported one attributed to high energy cost.

Supply of Energy

Electricity and coal are the main sources of energy in the cement industry. Coal is used for heating limestone in clinker production, while electricity is used for powering machinery. Some respondents were of the view that the electricity supply in the country is erratic and the coal that is sourced from the domestic market is of low quality and costly. The observation on coal is contrary to the position held by the local coal supplier (STAMICO) that the coal is of high quality and meets international standards. This suggests an information gap between STAMICO and cement producers.

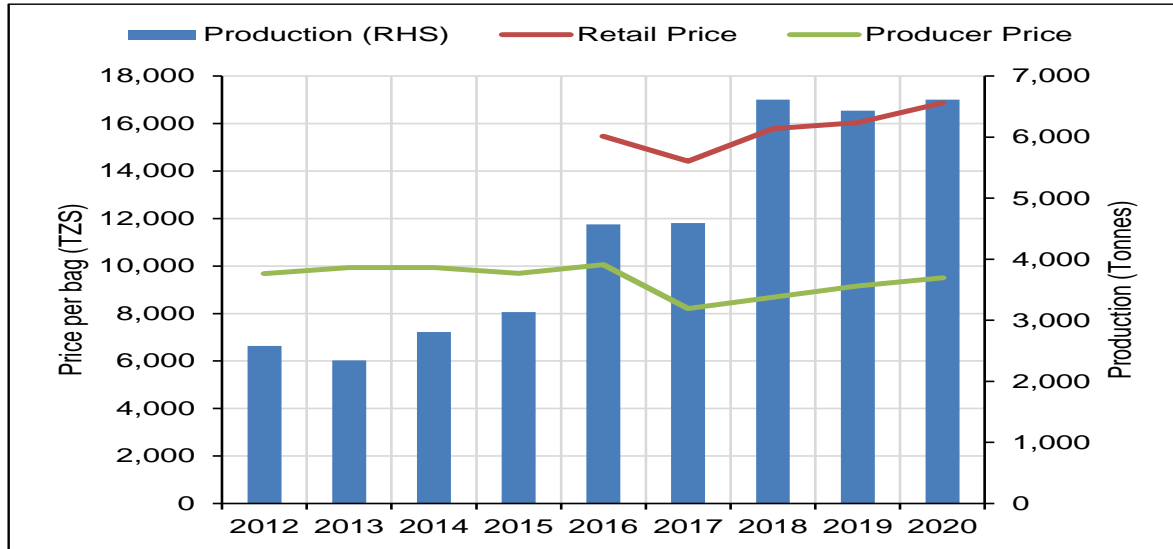
Spare parts and Skills Availability

Difficulties in accessing spare parts and experts for running machines also explain variations in cement production. This is because cement production machines are imported, which requires specialized skills to maintain them. It was indicated that some of the skills are lacking in the domestic market, requiring importation when there is a breakdown of machines. Sometimes these delays the maintenance of plants owing to the lengthy process of importing not only needed skills but also spare parts. Unforeseen global occurrences also contribute to this. For example, the outbreak and spread of COVID-19 pandemic and associated lockdowns and movement restrictions imposed by most countries also contributed to the shortage of cement and ultimately price increases in some parts of the country particularly in the first quarter of 2020. The problem was compounded further by the slowdown of cement production by most of the producers as they anticipated low demand amidst the COVID-19 pandemic. Also, due to restrictions associated with the pandemic, some firms could not import spare parts on time thus delaying the maintenance of plants. Towards the last quarter of 2020, Dangote cement factory the major clinker producer in the country also closed for maintenance anticipating lower demand during the general election period and affecting other factories in the value chain.

4.3 Possible Factors Influencing Cement Prices in Tanzania

Producer average prices declined only briefly in 2016-2017 after Dangote commenced production. However, the gain was not sustained thereafter. This trend also filtered in average retail cement prices, with the gradual increase in prices witnessed over time (**Figure 4.6**). For example, the average cement price increased from TZS 14,140 per 50 kg bag in August 2017 to TZS 18,829 per 50 kg bag in November 2020. The increase in price since 2017 amidst a rise in production suggests that factors other than supply could also be important in explaining dynamics in cement prices.

Figure 4.6. Producer average cement prices

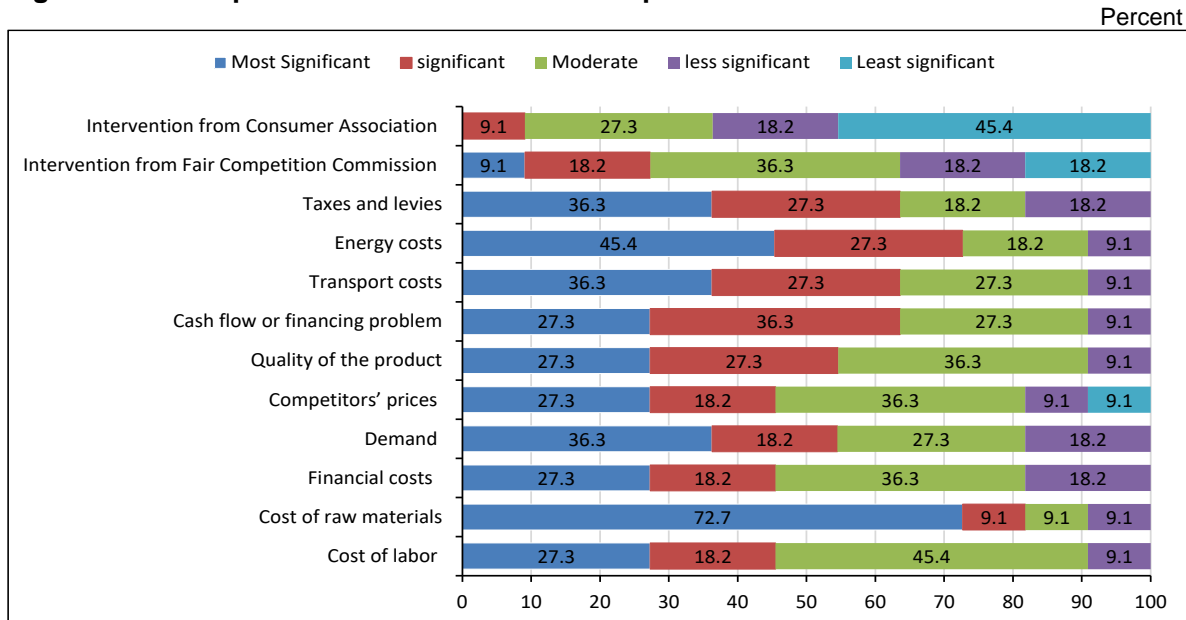


Source: National Bureau of Statistics

Stakeholders’ Perception about Factors Affecting Cement Prices

Respondents were asked to indicate factors that influence firms to increase, decrease or not change cement prices. Most of the firms attributed factors that influence increase or decrease in prices to costs of raw materials, energy, and transportation, as well as change in demand and taxes. The cost of raw materials was ranked first by most firms (72.7 percent), followed by energy costs (45.4 percent), demand (36.3 percent), taxes (36.3 percent), and transport costs (36.3 percent) (Figure 4.7).

Figure 4.7. Perception on factors that affect the price of cement

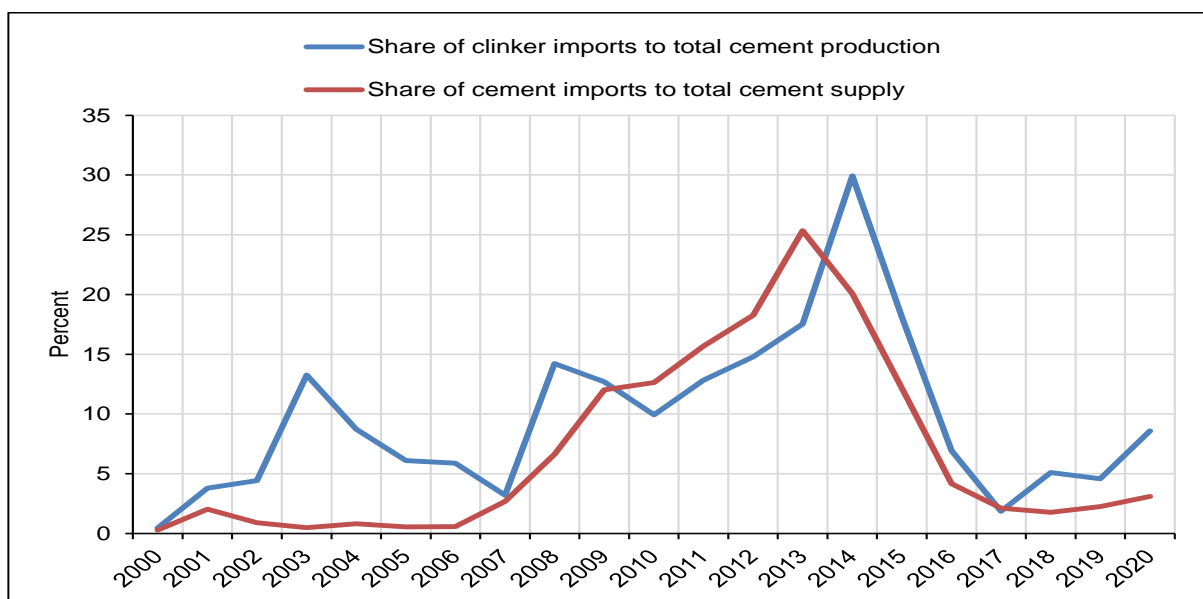


Source: Field Findings, February 2021

Cost of Raw Materials

Of the raw materials, limestone is the most important. Although this material is readily available in the country, it requires enormous energy to convert it into clinker which is costly. Some firms thought that clinker produced domestically is expensive relative to imported one. Since there are restrictions on the importation of clinker, it could be that the cost margin is transferred to the final consumer. Cement companies are limited to importing only less than 10 percent of their clinker requirement upon approval by the ministry responsible for Industry and Trade. Reflecting the impact of the restrictions, the share of imported clinker to total cement produced in the country was an average of 9.7 percent in 2000-2020 (Figure 4.8). Higher imports of clinker were recorded during the period of 2007-2015 owing to shortages of cement.

Figure 4.8: Share of imports of clinker and cement



Source: Tanzania Revenue Authority

Taxes, Levies, Fees and Charges

Meanwhile, the multiplicity of taxes especially in the extraction of clay and limestone was pointed out to increase production costs. On top of this, are levies, charges and royalties imposed by different government authorities. This is largely a result of multiplicity of government institutions that oversee the sector. Taxes include value-added tax, corporate income tax, property tax, withholding tax, capital gains tax, import duty and stamp duty. Levies include skill development levy, railway development levy, construction mining levy (for limestone and clay), and service levy (to local government authorities). Fees payable to different government entities include customs processing fees, mining license fee, mineral clearance fees, business license fees (for plants and depots), and Government Chemist Laboratory Agency fees. Other charges are royalty (on pozzolana, red soil and limestone), land rent, OSHA fees, TBS fees, Workers' Compensation Fund contributions, and radio call license fee.

Power Supply Constraints

Unreliable power was pointed out as another challenge. Frequent power cuts contribute to machine failures. In the absence of grid power, factories resort to the relatively expensive alternative power sources such as generators. Thus, the increase in power cost is passed to the consumer through a price increase.

Furthermore, the price of electricity for industrial use, currently at USD 0.102 (TZS 236.37 per KWh) is higher than other selected countries in the region. Rwanda for example charges a price of USD 0.097 per KWh, while South Africa charges USD 0.075 per KWh. It was indicated that efforts to reduce costs of power should among others target connecting cement factories with gas to generate their own electricity. The cost of producing electricity using gas is estimated at a range of USD 0.017 to USD 0.022 per KWh, which is much less than the price of grid electricity. Currently, of 11 operating cement factories, only two are connected to the national gas distribution system.

Transport Cost

The cement industry is concentrated along the coast of the Indian Ocean, reflecting the need to exploit economies of scale and easy availability of raw materials. Given the size of the country, this implies that supply to the mainland needs efficient transport infrastructure and logistics. Distributors and retailers indicated that markup for transport costs contributes significantly to retail and wholesale prices. Cement is usually transported to final consumers through roads due to aging railway infrastructure and poor customer service. The average railway transport cost per tonne per kilometer during the study period was estimated at TZS 127, slightly below TZS 136 per tonne per kilometer for roads. Average railway transport cost is likely to be much lower when the more efficient standard gauge railway comes on stream while assuming customer-centric services.

Seasonality Factors

Seasonal pattern of consumers also contributes to cement price increase particularly when ensuing demand does not match supply. Some respondents indicated that price spikes are revealed when high seasonal cement demand coincides with low production associated with the closure of plants including maintenance. Prices increase as well, if suppliers failed to predict well future demand. The problem is compounded if the effect starts from producers of clinker, the main raw material for cement production. The noticeable increase in prices across the country in the fourth quarter of 2020 and the first quarter of 2021 was attributed to the underestimation of demand by producers during the general elections and the COVID-19 pandemic outbreak periods.

High Demand Associated with Parallel Implementation of Projects

High demand associated with parallel implementation of mega infrastructure projects has a role to play as well. Such projects include construction of the Nyerere hydropower dam, standard gauge railway (SGR), Tanzanite bridge, and Ubungo interchange bridge. Normally factories accord more priority to government-related demand than would be for other customers due to high trust and economies of

scale aspects. It was indicated that, the production of cement in most factories was not aligned with the ensuing implementation of these projects thus contributing in creating a shortage of cement in some parts of the country. This points to two points: 1) need to encourage to cement factories to increase production during high demand seasons, or 2) government to relax cement importation restrictions if domestic production fails to catch up with demand to tame price hikes.

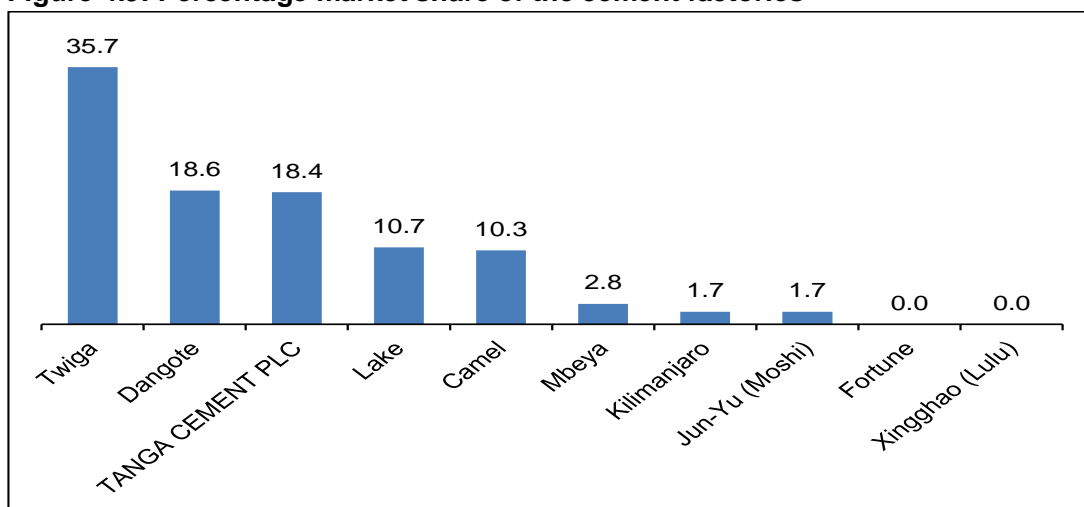
Dishonest Cement Traders

Factories were requested to indicate gate prices they charged from 2018 to 2020. The results suggest that the prices generally remained unchanged ranging from TZS 8,500 to TZS 12,800 in 2018 and TZS 10,500 to TZS 13,500 in 2020. This implies that the surge in cement prices particularly in the last quarter of 2020 and the first quarter of 2021 occurred along the supply chain. Some respondents indicated that some dishonest wholesalers and retailers were the culprits since they have more information about cement market conditions as they interact with producers directly.

Competition Aspects

Cement business is dominated by Tanzania Portland Cement Company, which produced about one-third of the total cement produced in the country during the study time. The other two big producers, Tanga and Dangote cement factories altogether accounted for 36.9 percent of the total (**Figure 4.9**). Such a market structure may lead to price leadership in the search for higher profits if other firms do not react in the opposite direction. This is much so because of cement import bans and protective tariffs. As indicated earlier in 2016, excise duty on cement imports was raised to 35 percent from 10 percent and subsequently import ban was invoked to protect domestic producers from cheap cement imports. Surprisingly about 64 percent of the respondents indicated cement market is competitive. The conclusion could have falsely been grounded on the number of factories in the market rather than the market share.

Figure 4.9: Percentage market share of the cement factories



Source: Field Findings, February 2021

Cement production is energy-intensive, thus producers with a cheaper and more reliable energy source such as gas have a competitive edge over those who depend on unreliable grid electricity. Also,

integrated plants i.e., those producing clinker and cement also hold a competitive advantage since they produce the raw materials for their own use and sell or export the excess to others.

Most of the factories are privately owned with a combination of local and foreign joint ventures with a limited public stake (**Table 4.1**). Such ownership structure suggests high incentives for innovations and operational efficiency as private shareholders are normally interested in making profits. In search of profits, dominant firms could possibly also act in a manner to outcompete others in the market, i.e., monopolistic bents, probably setting prices above those obtainable under a competitive environment.

Table 4.1. Ownership of cement factories

Factories	Ownership	Location
Camel Cement	Private-local company	Coast region
Lake cement	Joint venture	Dar es salaam region
Fortune Cement	Private –Foreign Company	Coast Region
Tanga Cement Plc	Joint venture	Tanga Region
(Moshi Cement)	Joint venture	Kilimanjaro region
Kilimanjaro Cement Co Limited	Joint venture	Tanga region
Huaxin (Maweni Limestone Ltd)	Joint venture	Tanga region
Tanzania Portland Cement (Twiga Cement)	Joint venture	Dar es salaam region
Mbeya cement	Joint venture	Mbeya region
Dangote cement industry	Private –Foreign Company	Mtwara region
Xingghao Group Ltd (Lulu cement)	Private –Foreign Company	Lindi region

Source: Field findings, April 2020

4.4 Policy, Legal and Regulatory Environment

As indicated earlier, cement is a homogenous product traded in an oligopolistic market. To ensure the cement industry benefits the economy through adequate supply at affordable prices, the government has put in place a policy, legal and regulatory framework that guides the cement industry in particular, and the manufacturing sub-sector in general. Such a framework has evolved in line with the government's economic objective to build a vibrant industrialized economy with a view to generating more jobs and government revenue.

Policies and plans aim at achieving the targets articulated in the Tanzania Development Vision 2025. Such strategies and plans include the Mini-Tiger Plan 2020, which led to the establishment of special economic zones (SEZs) and export processing zones (EPZs); and the Integrated Industrial Development Strategy (IIDS) 2011–2025 that has the objective of building a competitive industrial sector and creating industrial opportunities to use locally available resources for the manufacturing process.

In facilitating the achievement of Tanzania Development Vision 2025, the Long-Term Perspective Plan that runs from 2011/12 to 2025/26 together with its associated plans endeavor to improve the business environment to support industrial development, cement being one of the strategic sector for continuing to build a competitive and industrial economy for human development. Key areas of interest include the establishment of the requisite transport and energy infrastructure. This effort also is revealed in the Sustainable Industrial Development Policy, 1996-2020, which targeted providing a conducive business environment, promoting trade and competition, and developing social and economic infrastructure. The Tanzania Investment Policy (1996) on its part, promotes the establishment of competitive infrastructural facilities especially reliable power, water, telecommunication, and transport and encourages the use of domestic materials that support greater sectorial linkages within the economy. The policy seeks to create an enabling environment that encourages both public and private sector investment in the industrialization process.

Furthermore, some institutions have been established which have a bearing on the development of the cement industry as well. One of those institutions is the Fair Competition Commission as enshrined under the Fair Competition Act, 2003, which ensures that production and pricing are done in a manner that is consistent with fair competition. As aforementioned, in the absence of regulation, producers may either collude and create oligopolies or engage in a race to the bottom that can create monopolies.

The environment is another factor requiring oversight, and thus, has a bearing on the performance of the industry. The National Environment Management Council which was established in 1983 is responsible for managing environmental issues. The Mining Commission is responsible for regulating all mining activities in the country, while the Ministry of Trade and Industry works to create a conducive business environment by ensuring the availability of essential services such as electricity, water, communication, and transport networks. The Ministry also grants import permits of raw materials such as clinker. The Ministry does not have a direct role in cement pricing, as stipulated in the Sustainable Industry Development Policy 1996-2020. The policy explains that the Government recognizes the role of the private sector as the principal vehicle in carrying out direct investment in the industry. The Ministry can, however, amend policies, laws and legislations whose provisions discriminate or tend to discriminate against private sector investors.

These policy and regulatory interventions have an impact on cement supply and thus also affect cement prices. The extent of the impact can, however, not easily be measured directly.

5.0 Conclusion and Policy Recommendations

This study examined factors, which affect cement supply and prices in Tanzania, largely employing an interview-based approach supplemented by secondary data analysis. It was found that: cement supply challenges in the country are largely attributed to domestic production constraints, with cement export and import playing a very small role. Generally, factories match cement production with demand. This inclination contributes to intermittent shortage of cement supply in some parts of the country followed by price hikes when other constraints come into interplay as observed in 2009-2015, 2019-2020, and 2020-2021 periods. Respondents pointed out that the constraints relate to availability of raw materials including clinker, energy supply, technology gap, transport and logistics, spare parts and skills availability. These challenges complicate factories efforts to increase capacity utilization from the current 63.1 percent of the total installed capacity of 10.4 million tonnes, lower than that of Kenya of 13 million tonnes per annum⁷. When asked to mention factors which drive cement prices in the country the respondent's views may be categorized as: supply side factors such as cost of raw materials; power supply; transport cost, seasonality, policy and regulatory factors including taxes, levies and charges, and industry-wide factors particularly, incomplete information about demand, dishonest traders, and competition aspects.

It is anticipated that some of these constraints will be reduced when the on-going mega projects are completed and come on stream. A case in point is Nyerere hydropower plant which is projected to reduce power challenges in the country. The second strategic project is Standard Gauge Railway (SGR) that is set to connect the coastal regions, the major cement producers, with the central and western regions of the country and with neighbouring countries such DR Congo, Burundi, Rwanda and Uganda. Other areas where the government has put considerable emphasis is construction of tarmac roads to link all regional centres in the country and connection of factories to domestically sourced piped natural gas. These efforts notwithstanding, the following recommendations are made:

Issue #1: Cement industry is power-hungry, but the power supply is costly, unreliable, and falls short of producers' demand. Also, increase in transportation costs feeds into consumer prices. The Government should consider to:

- i. encourage cement producers to build depots along the rail line to facilitate the distribution of cement at a lower cost upon completion of the SGR project.
- ii. fasten supply of natural gas to cement plants to reduce cost of production. This may also attract new investment in cement industry particularly in areas rich in limestone.

⁷ <https://constructionreviewonline.com/concrete/cement-production-in-africa-and-pricing-and-trends/>

- iii. fast-track the implementation of measures proposed in the blueprint to reduce the cost of compliance on government regulations and continue streamlining revenue collection to avoid double-taxation tendencies.

Issue #2: Temporary shortage of cement causing price hikes. This occurs when major cement producers simultaneously halt production for maintenance or other reasons and cause prices to soar along the value chain. Responsible ministry to:

- i. monitor developments in cement prices and intervene where necessary using market-based measures rather than direct price controls. For instance, the government to provide for flexibility to issue temporary importation permits within allowable quotas to ensure adequate cement supply at affordable prices during shortage times. This applies also to clinker, the main intermediate raw material used in cement production. This measure was successfully used to curb cement shortage and moderated prices in the period of 2008-2015. Operational incentives may also be considered during crisis periods.
- ii. oblige cement producers to notify on their timeframe for major closures for regular maintenance. This will ensure that the government projects properly the cement supply situation in the country and take appropriate decisions before the shortage escalates to a crisis.

Issue #3: Cement market is dominated by few firms which may prompt anti-competitive behavior or collusion to maximize profits: The Fair Competition Commission should closely monitor developments in the cement industry to deter the possibility of collusion or cartel formation or any other anti-competitive conduct in the industry to avoid abrupt shortages and price hikes not supported by market fundamentals.

Issue #4: Dishonest cement agents and traders: Factories to collaborate with law enforcers and regulator to ensure dishonest behaviour tented in inflating cement prices in quest for supernormal profits are delt with immediately and those caught are punished commensurate with the committed crime.

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Appendices

Appendix I: Distribution of Respondents by Region

Region	Distributor/ Wholesaler/ Retailers (%)	Cement producers (%)	Other organizations (%)	Total (%)
Dar es Salaam	31(27.0)	3(27.3)	28(93.3)	62(39.7)
Pwani	5(4.4)	1(9.1)		6(3.8)
Tanga	6(5.2)	3(27.3)		9(5.8)
Dodoma	19(16.5)		2(6.7)	21(13.5)
Kilimanjaro	6(5.2)	1(9.1)		7(4.5)
Arusha	20(17.4)			20(12.8)
Mbeya	10(8.7)	1(9.1)		11(7.1)
Mtwara	18(15.7)	2(18.2)		20(12.8)
Total	115(100)	11 (100)	30(100)	156(100)

Source: Authors' construction based on field findings April 2020

Appendix II: List of Cement Producers in Tanzania

	Group name	Company name	Facility name & City Located	Contacts
1	Dangote Cement Plc (dangcem)	Dangote industries (Tanzania) Ltd	Mtwara	Country Manager – Abdullahi Baba Sales Manager – Gbenga Akinyombo [gbenga.akinyombo@dangote.com]
2	AfriSam (South Africa) Pty Ltd	Tanga cement Plc	Pongwe, Tanga	Pongwe Factory Area, Korogwe Road, P O Box 5053, Tanga, Tanzania Tel: +255 27 2644500-2/2610604 Mob: +255 746 293 325 Mob: +255 746 293 326 Fax: +255 27 2646148 info@simbacement.co.tz
3	Amson Group	Camel Cement Company	Mbagala, Dar es Salaam	P. O. Box 22786, Dar es Salaam, Tanzania Email : info@camelcement.net
4	Banco India	Lake Cement	Kimbiji, Dar es Salaam	P.O Box-40707, Dar-Es-Salaam, Email : biswajeet.mallik@lakecement.com Phone: +255 65 8888999

5	Huanxin Cement Co, Ltd	Huaxin Tanzania	Tanga	
6	Kilimanjaro Cement Company Ltd	Kilimanjaro Cement Company Ltd	Tanga	Phone: +255 27 2977864 Email: info@kilimanjarocement.co.tz
7	Kisarawe Cement Ltd	Kisarawe Cement Ltd	Kisarawe (Lucky Cement), Dar es Salaam	Phone : 022 2137115 info@luckycement.co.tz
8	LafargeHolcim Ltd	Lafarge Tanzania (Mbeya Cement Co.Ltd)	Mbeya	Phone: +255 767 737 366 customercare.mcc@lafargeholcim.com www.lafargeholcim.co.tz
9	Xingghao Group Ltd (Lulu cement)		Mtwara	
10	Scancem International DA	Tanzania Portland Cement Company Ltd (TPCC)	Wazo Hill, Dar es Salaam	Telephone: +255 746 810 930 Fax: +255 746 810 931 E-mail: info@twigacement.com
11	Moshi Cement Industry		Holili Moshi Kilimanjaro	
12	Arusha Cement industry	Arusha Cement Co. Ltd	Arusha	Null , Arusha Tanzania, United Republic of +255 754 420 577
13	Fortune Cement company Ltd	Fortune Cement company Ltd	Vikindu Village,. Dar es Salaam	Vikindu Village,. P. O. Box 105157,. Dar es Salaam, Tanzania