

## An Evaluation of Transport and Logistics System Options for Cement Distribution in Nigeria

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### **Abstract**

*This study examines the logistics of moving cement brands to market centres in Nigeria. The major objective is to evaluate transport and logistics system options used by cement companies in Nigeria, as a basis for recommending an effective option that would optimize cement haulage and distribution system in the country. Information obtained from the Logistics Units of three selected companies provided the basis for the evaluation. The study observes that while West African Portland Cement (WAPCO) depends solely on undiluted and total outsourcing of its transport system, Ashaka Cement Company relies on partly out-sourcing and free-for-all system. Obajana Cement Company on the other hand practices a mixture of company- own vehicles and outsourcing. On the basis of the strengths and weaknesses of these options, the study concludes that total outsourcing by contracting out to professional haulage firms is the best option and therefore recommends its adoption by cement companies and other haulage industries in Nigeria.*

### **Introduction**

The demand for cement in Nigeria has been increasing progressively due to steady improvement in economic activities across the country. The construction industry has been boosted thereby expanding the market for cement products. A major response to the increased demand is the establishment of cement factories in different parts of the country. Presently, there are six (6) factory sites in Nigeria located at Sokoto, Ashaka, Gboko, Obajana, Ewekoro/ Shagamu and Ibese. Despite the establishment of these factories, there still exists serious imbalance between domestic supply and demand resulting in not only astronomical increase in the price of cement, but also the dire need to supplement local production through importation. The importation of Bua brand with a supply base in Port Harcourt is in response to this need.

Cement product is inherently bulky in nature and this has serious implication for the cost of transportation. The cost of moving cement products to market centres constitutes a substantial proportion of the overall production cost which ultimately affects the market price (Sumaila 2004). Transport cost therefore, limits the distribution of cement products within competitive price areas. Thus, each cement factory in the country has its own market area. As examples, Portland cement in Shagamu and now Dangote Cement factory at Ibese serve all the south-western states such as Lagos, Ogun, Ondo, Osun, Ekiti, Edo and Kwara. Dangote factories at Obajana and Gboko have the North Central states of Kogi, Benue, Niger, Plateau, Nassarawa and the FCT as their main market areas. In the case of Sokoto cement, it serves the Northwestern states covering Sokoto, Zamfara, Katsina, Kebbi, and Kaduna states. Ashaka cement on the other hand, serves mainly the North-eastern part of the country, covering Taraba, Borno, Kano, Adamawa, Plateau, Nasarawa, Gombe, Yobe, Kaduna and Bauchi states.

But despite these known and defined catchment areas for the various factories, there are in virtually all states of the country cases of market overlaps. It becomes axiomatic therefore that the market share of any cement factory in these areas of market overlaps would depend on the

ability of the factory to make its products available at the right time, at the right place, and at a competitive (right) price. This therefore underscores the importance of effective and efficient transport and logistics system in the distribution of cement to market centres. Defects in the logistics system could lead to frequent stock out situation, too long delivery times, and service inefficiencies which in the short term, would lead to certain loss of sales/patronage and in the long-term may result in a definite loss of market share. It is against this background that this paper provides an evaluation of the transport and logistics system options used by cement companies in Nigeria. The major objective is to recommend an effective system option that optimizes cement distribution and holds the promise for its effective haulage system in the country.

### **Transport and Logistics System Options**

Generally, cement production depends on transportation. This is because; both raw materials and finished products are naturally bulky. Limestone and Gypsum which are the major raw materials for cement production are very bulky and moving them over a long distance incurs high transportation cost. This is why most cement factories are usually located close to the sources of raw materials in order to minimize operation cost (Ojekunle 2004). In the same vein, the finished product (i.e. cement) is also relatively bulky such that cost of distributing it is also significant. Thus to reduce operation cost, cement factories must of necessity minimize the cost of transportation. This can successfully be achieved through optimization of transport and logistics services. That is why all over the world, the provision of efficient and effective transport and logistics services has today become a core and integral part of the production process (Emmett 2005).

Indeed the importance of an optimal distribution logistics as a means of making and improving corporate profitability has never been greater than in this era of inflation, rapid technological change, globalization, competitive market and recession. These have combined to produce an environment in which the options for corporate strategy are much constrained. Yet at the same time, for many organizations, these same conditions have provided a major opportunity for growth i.e. specifically, improvement in performance through revised approach to the distribution strategy (Ndikom, 2008). In every production process the cost of distribution is steadily growing and thus accounts for an increasing proportion of gross national product in most developed economies.

All these, imply, therefore, that special attention must be paid to transport and logistics in order to achieve corporate goals and objectives. It is for this reason that optimizing transport and logistics should be a major concern to organizations especially those in the distribution business (Hugos, 2011). According to him, such efforts are necessary to improve:

- Overall operational efficiency of a company
- Eliminate bottlenecks in the distribution chain
- Reduce overall operation cost
- Improve customer services
- Increase profit margin

Generally, the following options exist for improving transport and logistics of cement distribution (Sumaila et al, 2004).

**Option A: Company to Own and Run Its Fleet of Trucks to All Sales Outlets**

In this option the company will establish a transportation unit which will be charged with the responsibility of running the transportation system required for the distribution of its product. The company provides the trucks, employs the drivers, establishes a maintenance workshop and fuels for the vehicles.

A major attraction of this approach is the fact that the company can control the movement of its product and ensure on-time delivery to market outlets. It can impose sanctions on erring drivers, transport supervisors and managers. Additionally, the company will be able to avoid the risk of dependence on professional hauliers who may have the need to satisfy the demand of several customers. This owner operated transportation system is particularly relevant for small companies with localized or restricted market, and in situations where an integrated market system (e.g. where the driver doubles as the sales executive) is desired.

It has been shown that in adopting this strategy, many own operators are not providing themselves with the most efficient service option as their fleets are usually underutilized. It also requires high capital outlay with long-term return on investment, and would involve restructuring of the company's operation (Wood, 1981).

**Option B: Own and Run Fleet to Major Outlets and Contracting Out Minor Outlets**

This option is similar to the first option except for the addition of contracting out the transportation system to the minor outlets, an approach similar to that adopted by Nigerian Bottling Company. Contracting of course allows a company to concentrate on its core business and make larger investments in the core business leaving transportation to the experts. The third party operator is fully responsible for the provision, maintenance and operation of the fleet. A contractual agreement is signed on fees payable.

**Option C: Engaging Professional Hauliers**

This option represents a situation where the company contracts out the carriage of its products completely to professional hauliers. As explained in the professional hauliers' involvement under option B, contracting out the transportation will enable the company to concentrate on its core business and make larger investment in the core business leaving transportation, which is a non-core activity to professionals. Engaging such professionals also allows the company to:

- Deploy its capital to the best advantage of the company
- Invest in the areas of its core business which has the greatest profit potentials for the company
- Take the advantage of the expertise of other professionals, and thereby ensure efficiency.
- Avoid the breakdown, uncertainties and associated problems entailed in transportation business, as these can be diversionary to company's main business (Ogunsanya, 1982).

Besides these, adopting this will allow the company to have more time and resources to plan for the expansion of its existing market, maintaining product quality and aiming at being strong to face competition from other cement manufacturing companies

Contracting out may not be only for cost-cutting. The strength of the strategy rests on the fact that the haulage firm is doing with unpolluted commitment what it is best at doing and in the process, can contribute to the company's objective of eliminating delays, product diversions, reducing turn round time and optimizing customer satisfaction.

There are four possible derivatives of this option and they are described as follows:

### **Direct Outsourcing**

In the direct outsourcing, the company invites, screens, and registers potential haulage companies. No agreements are signed between company and hauliers. Hauliers queue at designated parks and are invited on a service and pay basis, to deliver its product to any assigned destination. A major problem with this option is the total lack of commitment by the haulier, who may be available or unavailable depending on the external market demand for its service. The company could suffer business set-backs from the unreliability of the services that can be provided by this option (Sumaila, 2004).

### **Route Concessioning**

In route concessioning, haulage firms are engaged to ply specific routes. Route concessioning could be with competition when two or more haulage firms are engaged to render service on a specific route; or monopolistic when only one haulage firm is engaged to service such a route. This concession approach could take a variety of forms. For example, a haulage firm may sign an agreement to provide an uninterrupted service to the company, carrying an agreed minimum volume of cement to a specific destination over an agreed period of time. The concessionaire provides the trucks, maintains and operates the trucks and gets paid by the company in two ways. The first is a fixed lump sum which will take care of possible periods of depression in business and/or backhaul problems. The second is a variable fee based on the quantity transported.

In this option, it is expected that the commitment of the haulage firm will be total, and the company does not need to bother about transportation. Although this option may entail greater expenditure on transportation than the others, the problems of delays, diversions, damage to cargoes and the headaches caused to company and its customers by an unreliable transport can be avoided. Such extra expenditure will be justified by the resultant reliable and on-time guaranteed transport which this option entails (Ogunsanya, 1982).

### **Distributor Service**

Another option relates to the distributor providing its own truck. This option will depend on the distribution option adopted by the company. If the self-collect system exists then the distributor can be asked to provide his own truck from the company plant to his warehouse. If it is the delivery system the company will need to engage professional haulage firms to service the major sales outlets represented by the company depots while allowing distributors either in part or in full the transportation of the product purchased from the company.

However, the company may reimburse the distributor on the basis of the ton-kilometre hauled. A major problem with this approach is the uncertainty of business. Distributors may divert fleet to a more rewarding venture if cement business is low. This may create a clog in the company's factory warehouse.

### **Open Market Sourcing**

This entails the company and the buyers of its products sourcing for transport on a need and pay basis. In this system, no transporter is registered with the company. So neither company nor transporter has any commitment to each other. Transporter bargains with company or product buyer on freight rates which may be variable. The unreliability of this option in the transportation of a company product that enjoys a stable production does not recommend it to any company. It is perhaps only relevant in the “sand supply” industry, which enjoys this option (Sumaila, 2004).

### **Methodology**

This study relied on information from three major cement companies in Nigeria. The selected companies are currently the most popular in the country. Given their establishment dates and years of continuous production, it was envisaged that they would have evolved stable systems of transporting their products to the markets. The companies are West African Portland Cement Shagamu, one of the oldest factories in the country; Obajana Cement Factory, the oldest in the Dangote Group; and Ashaka Cement Gombe regarded as the ‘Star of the North’ We visited the operational Headquarters of the companies in May, 2012, looked into their documents and interacted with the Heads of the Logistics Units. The following information was sought for:

- i. Department in charge of transport and logistics
- ii. Logistics system in use
- iii. Number of transporters engaged
- iv. Service Agreement
- v. Vehicle types, and capacities
- vi. Haulage rates and payment system
- vii. Monitoring and control systems
- viii. Quality control in terms of vehicle standards and driver training and testing
- ix. Modal mix
- x. Dispatch and scheduling procedures and loading/unloading systems
- xi. Logistics challenges.

An inspection of sample vehicles was carried out. The objective was to ascertain their standards and operational conditions. Drivers of the vehicles and their assistants were informally interviewed on travel challenges, and back-haul issues. The Dispatch offices were also visited where information relating to scheduling and loading techniques, lead time, and dispatch policies were obtained. The details of the transport and haulage systems of the companies were summarized and the findings are discussed in the next section.

### **Evaluation of the Options**

The characterization of the transport and logistics systems of the study companies provides a basis for the evaluation of the options adopted by them. Table 4.1 presents a summary of these characteristics, while detailed description of each company is presented in what follows.

**Table 4.1 Summary of transport and logistics system characteristics**

Variables	Dangote	NAPCO	Ashaka
Department Responsible Logistic System	Logistics department Company own Vehicle and Outsourcing	Supply chain Outsourcing	Sales and marketing Mixed outsourcing
Vehicle Types and Capacity	DAF and Man Dissel (40 tons)	IVECO (40 tons)	DAF, IVECO and ManDissel (30tons)
No. of Transporters	Not Specified	8 No	8 No
Haulage Rate Policy	Negotiated based on Current rates in the country	Same as dangote	Per Ton Per Km
Monitoring System	GPS	GPS	GPRS
Driver Training and Testing	Runs a driver Academy	Driver Viability test	Technical Examination
Modal Mix	Road and Rail	Road and Rail	Road and Rail
Dispatch Schedule	FIFO	FIFO	FIFO

Source: Field work, May 2012

### **Dangote Cement Company Obajana**

Out of the total of 23 million tons of cement produced in Nigeria today, Dangote Group through its three factories at Obajana, Gboko and Ibesse provides slightly above 60% of this volume. But we found that the group maintains a uniform policy in the transportation of its product. The company runs a mixture of company-own vehicles and use of private transporters depending on the distribution system. For 'self-collect' system which allows the customer to arrange for the transportation of his product, private hauliers are used. Surprisingly a few of the customers use their private haulage vehicles, thereby making it a free-for-all system. Vehicles of different types, sizes, and quality have free access to the company premises with minimal pre-entry quality standard checks. Haulage rates are negotiated depending on distance.

On the other hand, the company has its own fairly large fleet operated and maintained by the company. The vehicles are used for customers adopting the "delivered system". Payment is made for both the cement and the transportation which enables the consignment to be delivered direct to customers' warehouses. Haulage rates are published in official documents of the company which encompass both the cost of loading at the factory and the backhaul compensation i.e. returns empty truck.

Through the vehicles used by the company are majorly DAF and Man Dissel, but they are uniquely of the 40 ton capacity. The company runs a Driver Academy which trains the drivers not only for the company but also for the haulage companies in the country.

The Dangote option is clearly a mixture of company own vehicles and out-sourcing. This makes it vulnerable to a number of challenges and problems. Running company-own fleet poses considerable challenges on its own not to talk of when combined with an unregulated and loose outsourcing system. The demonstrable limitations and operational difficulties of such systems have been detailed earlier in section 2.2.

### **West African Portland Cement Company (WAPCO) Shagamu**

WAPCO-Lafarge Company produces about 15% of current cement volume in Nigeria. The Logistics unit is under the reporting arrangement of Supply Chain Department. The company relies completely on third party arrangement for the transportation of its product. Both individual and corporate haulers are used. The company has in place a third party truck specification standards which it uses for technical evaluation of all vehicles both private and corporate. Contracted Vehicle Inspection Officers (VIO) are used for this purpose.

For private transporters, a minimum of ten(10) trucks are required for engagement. About eight (8) private transporters are currently engaged. The company guarantees these haulers in the Banks while payment for services rendered are also done through such banks. Corporate organizations on the other hand require a minimum of fifty (50)trucks for operation. Today known transport companies such as Chisco and ABC are engaged by the company.

For drivers of all vehicles, their relevant documents are checked. They must also tender medical report from accredited hospitals, while they also undergo defensive training before commencement of service. All these constitute the driver viability test which has a one-year validity period.

Product diversion has been totally eliminated as vehicles are monitored through the GPS tracking system. In addition the delivery invoice is produced in triplicates. One is left in the office while two copies are given to the driver which must be signed by the customer on delivery of his product and a copy returned to the office by driver as proof of delivery and must also be attached to the payment voucher before the transporter is paid.

Freight charges are determined based on survey of freight charges in the country and vehicle turn around-time. Vehicle trips are cumulated for one month and payment made through the banks of the transporters.

The foregoing description of the transport and logistics system shows that West African Portland Cement Company depends solely on undiluted and total outsourcing of transport services using 3<sup>rd</sup> Party haulers. This has the advantage of efficient and effective delivery service as the entire operation is based on a contractual service agreement. Constant evaluation of the performance of the companies can be made, shortcomings identified and improvements made.

### **Ashaka Cement Company Gombe**

Currently, the Sales and Marketing Department overseas despatch, transportation, and other logistics activities of the company. For self-collect method, though the customer caters for the transportation of his product, the company carries out pre-entry technical checks on the vehicles used. This is to ascertain that the vehicles meet minimum operational standards. One major gap in the exercise is that little attention is paid to the drivers of the vehicles who we observe do not show up at the factory during loading process but are represented by agents/their assistants

For the delivered method, the company as a policy depends on total outsourcing of transport service using 3<sup>rd</sup> party (3PL) haulers who use mainly DAF, IVECO and MANDIESEL vehicle types. Today, the Company has Eight(8) approved Road Transport companies for its operation. The conditions of engagement include among others provision of Ten million naira (N10 million) guarantee and a minimum of fifteen (15) trucks while the service agreement is for a contract period of one year. Presently customization of the vehicles is done using Ashakacem logos only. Haulage rate structure is based on per ton per kilometre while payment is cumulated for one month for each vehicle. Rail transport is also used based on demand while rate is also calculated in the same way. Table 4.2. presents the delivery rate of cement to the various sales areas.

Table 4.2: Haulage Rates

DEPOT	DISTANCE, KM	NGN/T/KM	NGN/T	NGN/TRUCK
GOMBE	140	14.0	1,967	59,000
BAJOGA	15	66.7	1,000	30,000
D'TURU	235	11.3	2,667	80,000
BAUCHI	251	10.6	2,667	80,000
AZARE	262	10.2	2,667	80,000
YOLA	505	7.6	3,833	115,000
DUTSE	351	9.5	3,333	100,000
MAI'GURI	357	9.8	3,500	105,000
JOS	380	9.2	3,500	105,000
MUBI	403	9.5	3,833	115,000
KANO	420	9.1	3,833	115,000
JALINGO	436	8.8	3,833	115,000
KATSINA	588	7.7	4,500	135,000
ZARIA	625	6.9	4,333	130,000
KADUNA	695	6.7	4,667	140,000
ABUJA	750	6.7	5,000	150,000
		12.8	3,446	103,375

Source: Logistics Unit, Ashaka Cem, 2012

For both distribution methods, vehicle loading relies on a queuing system on the basis of first come first serve, all under the supervision and control of security men who issue a tally number to every vehicle on arrival. Vehicles are called into the factory in a batch of three as there are three mechanical loading points, which simultaneously load each vehicle in 25 minutes. On the average, it takes between 2-3 days for a vehicle to get loaded in the company. Vehicles then move to the scheduling point where they are weighed and consequently allocated routes. The problem is that the decision to dispatch the product to a customer or depot appears not to be based on any particular order or schedule.



Up till 2007, lead time was about 6 days to the depots but today it is only 3 days in the country. On paper, all deliveries are to the depots but operationally customers are informed and the vehicles consequently get re-routed to customers' warehouses. Monitoring is now done using GPRS which has succeeded in eliminating product diversion completely.

Drivers of the registered haulage companies are made to undergo both medical examination and operational briefings. Driver's manual prepared by the logistics unit is given to each driver which specifies the work instruction and code of conduct including safety and security tips.

It can therefore be concluded that Ashaka Cement Company can also be said to depend solely on outsourcing, but it has its own variant. While contracted professional transporters are used for delivered distribution system, the self-collect system on the other hand relies on loose and free-for-all transport system. As noted earlier in this paper, this system is confronted by a number of weaknesses which include the following.

- 1) Poor control of number, size, and quality of vehicles used.
- 2) It allows the entry of all sorts of individuals-drivers, agents, motor assistants into the premises of the company. This situation no doubt constitutes major security threat to the company.
- 3) It provides veritable opportunity for product diversion as monitoring and tracking of the vehicles are difficult.
- 4) The above can lead to "javelin sales" thereby creating artificial scarcity of the product in the sales areas as they could be taken to where margins are high.
- 5) Most importantly there is no loyalty as the transporters and their drivers have no moral or service attachment and commitment to the company.
- 6) Such sharp practices as underweight of the product and burstages are associated with such unregulated transportation system.
- 7) Finally, the integrity and public image of the company can be undermined and threatened through this system.

Thus, this system can rubbish the direct delivery system no matter its level of perfection with negative repercussions on the effectiveness and efficiency of the overall product delivery system of the company.

### **Conclusion and Recommendations**

We have shown in this paper the imperative of a robust transport and logistics system option for timely delivery of cement in the country. We also indicated that conventionally two main principles are involved in the choice of product haulage. The first relates to a situation where the company owns and operates its own haulage fleet, while the second represents where the company contracts out the carriage of its products to professional hauliers. Against these two known options and their variants, we described and evaluated the systems currently in use by Dangote Cement Company, West African Portland Cement (WAPCO) and Ashaka Cement Company Gombe.

The evaluation reveals that while WAPCO depends solely on an undiluted out-sourcing of its haulage system. Ashaka operates a rather untidy combination of partly free-for-all and partly contractual engagement of professional hauliers which makes the delivery system rather unhealthy. Dangote on the other hand operates essentially company own fleet mixed with

uncontrolled outsourcing. The demonstrable limitations and operational problems of this combination have been derailed and thus do not hold any promise for efficient service delivery.

It is therefore recommended that total outsourcing by contracting out the haulage system is the best option as it enables companies to concentrate on their core businesses and permit larger investments in its enterprise leaving distribution and transportation to the experts. It would convey on the company other internal and external benefits which include

- I. The desire to employ capital to the best advantage of the company and therefore, investment should be in the areas which produce the greatest profit for the business.
- II. The need to take advantage of the expertise and competence of other professionals.

Additionally, the third party approach to product haulage would also enable companies to aspire to achieve just-in-time service practice. This strategy makes sure that supplies reach where they are needed promptly using appropriate mode and means for carriage. This is because reliability and performance of haulage are of utmost importance in this strategy. Once these are achieved, companies would enjoy the benefits of an improved distribution system which would engender the retention and expansion of their existing markets and thus strengthen their competitive advantage.

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