

HERE OR THERE? AN APPRAISAL OF INDUSTRIAL LOCATION FACTORS IN GOMBE METROPOLIS, NORTH EAST NIGERIA, 1963-2013

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ABSTRACT

The apple of discord among location theorists and stakeholders in the industrial sector has been where best to site an industry. This led to the promulgation of theories and policies to provide a blueprint for the establishment of industries. In spite of the significance of industrial location discourse, Gombe in North East Nigeria did not feature in these decades of intellectual postulations. This is not due to absence of industries in the five decades covered by this study, but rather absence of research on the theme in Gombe. To fill this apparent gap, this paper used both primary and secondary sources. The objective is to give a historical synopsis of the factors and the dilemma that characterized industrial location decisions in Gombe. The result shows that infrastructure such as the railway, road, water and electricity exerted varied influence in the location of industries such as Gombe Oil Mill, Landa Sack factory and Niko Plastic industries among others. However, the paper identifies proximity to market as a major factor of location and government played a central role in determining where an industry should be sited. The paper finally recommends a holistic approach to industrial location where all stakeholders are involved so as to cushion the effects of poor choice of location and by implication, tame degenerative industrialization.

KEYWORDS

Industries, Industrial location, Infrastructure, Stakeholders, Market, Government

1. INTRODUCTION

The question of where to site an industry has been the preoccupation of manufacturers, industrial geographers, economic historians, and policy makers among other stakeholders. This could be linked to its centrality in determining among other factors, success or failure of an industrial establishment. Failure to take into cognizance the availability of water, electricity, access road, proximity to market and raw materials in location decisions has run many industries aground due to economic penalties associated with poor choice of location. Against this backdrop, several theories were developed to explain industrial location beginning from the Classical Least Cost theories of Von Thunen, Alfred Weber, Hoover and Laundhart (Fijita, et-al, 2002). Recent developments in the field of location led to the emergence of interdependence theories of location, maximum profit location, as well as Behavioural and Structural approaches among others. This paper presents diverse factors and the attendant dilemma which informed the location of industries such as the Gombe Oil Seeds Processing Company, Landa Propylene Woven Sack Factory, Dukson Soap and Detergent Factory, Gombe Fertilizer Blending

Company, Niko Plastic Industry and Gombe Dadaka International Flour Mill among others (Interview, 2018). The aim is to shed some lights on the dilemma and factors that dominated industrial location decisions in Gombe metropolis from the adoption of Industrial Development Plan of Northern in 1963 to the Nigeria's power sector reform in 2013. The significance of this discourse could be seen in its potential in demonstrating the trajectory of industrial location in the recent past and illuminating ways of developing more viable options of industrial location in the future. This is even more important as Gombe was selected as one of the seats of the seven new industrial parks approved by President Muhammadu Buhari on Wednesday, 19 September, 2019 (*Premium Times*, 2019).

Gombe Metropolis is located between Latitude $10^{\circ} 15'0''N - 10^{\circ}20'00''N$ and between longitude $11^{\circ}05'00''E - 11^{\circ}15'05''E$. It shares common boundary with Akko Local Government Area (L.G.A) in South and West, Yamaltu-Deba L.G.A. to the East and Kwami L.G.A to the North. It also occupies a total land area of 52Km^2 . The area comprises of Gombe town (the capital of Gombe State), which doubles as the Headquarters of Gombe Local Government Area, some parts of Akko and Kwami Local Government Areas. Gombe Metropolis covers an area estimated at 45 km^2 (Gombe Diary, 2012)

2. REVIEW OF INDUSTRIAL LOCATION THEORIES

Numerous theories were developed to explain the actors and factors behind industrial location decisions. Till the early sixties, these theories have been broadly classified into least cost theories, central place theories and interdependence models (Fujita et al, 2002). An overview of these theories is given below.

2.1. Least Cost Theories Of Industrial Location

One of the classical theories in this category is the Weber's Theory of Location. Although, Von Thunen's theory came before weber's but the former focused on the location of agricultural production, which is not our focus here.

Weber attempted to construct a pure theory of location which could be applied to all industries at all times. He therefore analyzed only the general factors that influence the location of all industries, and these factors he divided into those influencing inter-regional location and those influencing intra-regional location (agglomerating factor). He found three elements which vary regionally, raw material costs, transport costs and labour costs - but for analysis, raw material cost fluctuations are included within transport costs. Weber's plan was to locate firms in order to minimize transport costs, but he introduced labour costs as a distortion of this pattern, and finally, he also included the effect of agglomeration economies (Friedrich, 1929). According to Weber, an industry is attracted to location where costs of transport are lowest, that is to locations where the number of ton miles of raw materials and finished products to be moved per ton of product is minimized (Fujita, 2002)

Weber concludes that industries displaying a high material index are attracted towards the sources of raw materials whereas those characterized by a material index of less than 1.0 locate at the place of consumption

In terms of labour orientation, he argues that an industry will choose a cheap labour site if the labour cost saving are greater than the increment in transport costs at this site above the minimum possible transport costs. In the third part of his analysis, Weber examines agglomeration economies. He defines an agglomerative factor as cheapening of production when that production

is concentrated at one place. A plant locates in an agglomeration if the savings at this location offset the concomitant increase in transport cost

It should be noted that the Weberian analysis came under scholarly attack especially his assumption that firms are in a perfectly competitive situation. But more evidences have shown that the assumption of perfect competition is incompatible with the postulate of spatial framework for society. Because there cannot be perfect competition over space, for distance presents firms with monopoly advantages in proximate areas

Hoover's Theory of Location also tried to propound a Least Cost theory of location, in which he tried to overcome some of the weaknesses of Weber's theory He assumes perfect mobility of factors of production and takes transportation costs and production or extraction costs as the determinants of location. But Hoover's contribution has its limitations too. Like Weber, he viewed transport orientation as something that could be analyzed separately and did not integrate other causal factors into his theory as fully as he might have done.

2.2. Central Place Theory

Losch rejects the Least-Cost perspective of Weber and his followers, as well as the alternative of seeking the location at which revenue is greatest. Although, Losch criticized least-cost approach to location theory as being one sided, for neglecting demand but in order to overcome this weakness, he goes to the other extreme. The most serious limitation of his theory is his failure to consider spatial cost variations, which were eliminated in his assumption of a uniform plain with evenly distributed materials and population

2.3. Maximum Profit Location

Melvin Greenhut was the first, to make a major attempt to integrate the least cost and locational interdependence theories. He considers transportation as a major determinant of plant location and points out that it should be distinguished from other factors, not confused with them. An entrepreneur will tend to economize on transportation if freight costs comprise a large part of total cost, but this will be possible only if transfer costs vary significantly, at different locations. Material orientation is considered as a product of transport costs and it is pointed out that it occurs in two special cases: where the materials are perishable and where transport cost on material is much greater than on the finished product. According to Greenhut's theory of location, causal factors of location are: (1) Cost factors of location (transportation, labour and processing costs) , (2) Demand factors of location (locational interdependence of firms or attempts to monopolize certain market segments), (3) Cost reducing factors, (4) Revenue increasing factors, (5) Personal cost reducing factors, (6) Personal revenue increasing factors, (7) Purely personal considerations.

Recent developments in the field of industrial location saw the emergence of Behavioural and Structural approaches to location. The former was informed by growing dissatisfaction with the idealized assumptions which underpinned much of the classical approach to locational analysis.

Little information formed the basis of many locational choices and how imperfect such information often was and the increasing concentration of manufacturing into larger and larger concerns mean that large companies were often in a position to control local price of labour, inputs or land, in a manner which ensured that they did not have to make locational choices on the basis of selecting a site, which minimized such costs. They were large enough to select a location on other criteria and distort local cost surfaces.

As a response to the behavioural approach to theories of industrial location, in later half of 1970's structuralist or radical theories emerged which stress that enterprises are a part of the wider structure of society in which the interplay of capital and labour is based upon power coalitions whose interests are usually in conflict. The major elements in the Structuralist approach have been the role of very large enterprises in using their economic and political power to achieve authority, over their workforce, the role of organized labour in responding to this control and the overall pattern of change in the world economy (Fagbohunka, 2014)

As a compromise between theoretical perfection and practical necessity, Industrial Complex Analysis was developed to show that external economies of agglomeration and inter-industry linkages are increasingly important determinants of plant location in advanced industrial nations. They are tending to strengthen the advantage of a location in an existing industrial or metropolitan area for industries with complex input- output relations with other activities, thus reducing plant mobility to some extent

As enunciated in the foregoing, years of theoretical and econometric studies on industrial location resulted into classification of industries into raw material-oriented, market-oriented, labour-oriented and Agglomerative economy-oriented.(Latham III,1976) These typologies determine the priority given to a particular factor of location over another(Bonfatti,2013).

3. INDUSTRIAL LOCATION FACTORS IN GOMBE METROPOLIS, 1963-2013

The dilemma of industrial location in Nigeria is aptly captured in policy ambivalence. In Northern Nigeria Development Plan of 1963 for instance, the conflict seem to be obvious from its content which reads thus:

Industrial areas with full services, similar to those in Kano, Zaria, Kaduna and Jos, will be established. In choosing these, a balance will be struck between the desire of industrial management to go where the fullest services already exist and the desire of Government to pursue a policy of dispersing industries to areas so far without it. Appropriate concessions will be considered for special areas (Aboyade, 1977)

The defunct North Eastern State, Bauchi as well Gombe States continued to play a critical role in determining the location of industries. These roles were apparent in the allocation of lands (see table 1), provision of infrastructure and incentives to the industrialists. For instance in 1976 Bauchi, Gombe, Azare and later Misau (in 1979) were declared as urban centres of the newly created state. In this regard, Bauchi State Development Board was established by Law (Edict No. 4 of 1979) to be executive authority for planning and implementation of development schemes for all the urban centers which were equally industrial areas (Saddique, 1990)

Table 1: Land Use Distribution in Bauchi as at 1990

S/N	Land Use	Area Coverage	As % of total
1.	Residential	3,300	23.59
2.	Commercial	550	3.93
3.	Recreation	700	5.06
4.	Industrial	800	5.72
5.	Agriculture	1,100	7.87
6.	Public/Semi Public	4,500	12.18
7.	Roads (Including R.O.W)	2,135	15.27
8.	Undevelopable	900	5.44
	Total	13,935	100.00

Source: A. S. Saddique, “The Problems and Prospects of Physical Plan Implementation In Bauchi State: A Case Study of Bauchi Master Plan”, MSc. Thesis, Department of Urban and Regional Planning, ABU

The table above shows that 13,935 hectares of land was in use in Bauchi State as at 1990. However, this was against the 17,000 hectares planned in the Bauchi Master Plan. This suggests that 3, 015 hectares was not developed. Most importantly, only 7% of the land was allocated to the industrial sector (Gombe Master Plan, 2030,2003).In the case of Gombe, the land use in the industrial sector increased from 1.8 in 2001 to 7.2 in 2003 (see tables 2 and 3). This implies that by allocating land to manufacturers, government determines where industries should be sited.

Table 2: Committed Lands for various uses in Gombe as at 2001

S/N	Category	Total (Ha)	Percentage
1.	Planned Residential	1,058.6	69.9
2.	Unplanned Residential	292.8	19.3
3.	Commercial	15.5	1.0
4.	Public/Semi Public	57.4	3.8
5.	Industrial	27.0	1.8
6.	Roads/Street	59.6	4.0
7.	Organized Open Space	3.5	0.2
	Total	1,514.4	100.0

Source: Excerpt from *Gombe Master Plan, 2030*, prepared by Savannah Landev Konsult Nigeria Limited, Gombe for Gombe State Government, Ministry of Land and Survey,p.4

Table 3: Land Use of Gombe as at 2003

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S/N	CATEGORY	AREA (Ha)	% of total
1.	Residential	3,316,9	62.0
2.	Commercial	53.5	3.0
3.	Public/Semi Public	1,039.6	19.5
4.	Mixed Uses	35.5	0.1
5.	Industrial	378.5	7.2
6.	Roads/Streets	340.6	6.5
7.	Organized Open Space	87.8	1.7
8.	Rock-outcrops/Valleys/Vacant Land	292.8	-
	TOTAL	5,352.4	100.0

Source: Excerpt from *Gombe Master Plan, 2030*, prepared by Savannah Landev Konsult Nigeria Limited, Gombe for Gombe State Government, Ministry of Land and Survey, p.4

From the above tables, it is clear that about 99% of Gombe was devoted to residential use during the two historical epochs, spanning from 1919 to 1964. Only small pockets of public and semi public uses existed. However, between 1974 and 2003, other land use components became important. The major ones is the expansion of land area as well as relative to the residential land use, which is approximately 62% of the total built-up area. This further reaffirms the historicity of the view that Gombe town grew from a settlement of about 8 hectares in 1919 to large town of an estimated 700 hectares in 1974 and it grew to about 4,047 hectares in 2001 and 5,352.4Ha in 2003 (*Gombe Master Plan 2030*, 2003).

4. RAIL INFRASTRUCTURE

Since the commissioning of the Gombe Railway Station on Thursday, 11th April, 1963, railway infrastructure became one of the important location factors in the establishment of industries in Gombe metropolis. Our interviews revealed that Gombe Oil Seeds Processing Company, Dukson Soap and Detergent Factory and Landa Sack Factory among others were partly located at their present locations due to the presence of a railway infrastructure. In fact what enhanced the position of railway as a location factor is its proximity to Gombe central market. This implies that even if industries prioritized proximity to market in their location decisions, the railway infrastructure inevitably fits into the equation. It should be emphasized that in the period when these industries were incorporated, Railway was a dominant and cheapest means of transportation. Some evidences have shown that heavy machineries of Gombe Oil Mills and Dukson Soap and Detergent Factory were transported to Gombe via the railway. The importance of the rail line is further shown in the case of the Gombe Oil Mill given that the factory was privately connected to the Nigerian Railway line by a line running along the Northern boundary of the site to connect the main NRC line. This enabled the transportation of wagon of goods

straight from the factory to their various destinations. Raw materials such as groundnuts and cotton were easily transported to the factory. In addition to this, location decisions in establishing 'eclipsed' industries such as Gombe Textile, Gombe Flour Mill and Gombe Asbestos Factory considered the critical role of the railway. This position is in tandem with Studies by Banerjee

and others in 2012 which found that Chinese areas that were "treated" with a railway connection in late 19th century were somewhat richer in 1986, but did not benefit disproportionately from subsequent Chinese growth. Faber's study in 2012 finds the construction of highways in China favored the concentration of industrial activity in larger locations, to the detriment of smaller ones (Benjamin, 2012). Jedwab and Moradi's work in 2012 focus on the long-term impact of colonial railways in Ghana, finding that places that were connected by the railway are more developed today.

5. ROAD NETWORK

During the period of decline and eventual collapse of the railway in Gombe metropolis, access road became an important consideration in the location of industries in metropolitan Gombe. Available sources revealed that as at 2004, Gombe State has about 572.20 Kilometre of rural and semi-urban road network and 302.82 kilometers of urban road network (Hashidu, 2015). While from 1996-2006; 32.16km of road was constructed in Gombe City. This constitutes 29.7% of roads constructed in the whole of Gombe State in the said year. More so, from 2006 to 2014, 76.12km of road was constructed in Gombe City, representing 70.3% of roads constructed in

Gombe State costing 37.4 billion (Hashidu, 2015). Most of our interviewees revealed that the Gombe-Biu Highway was an important consideration in the location of industries in *Bisije*-Bogo axis, an area declared as an industrial area by the British colonialists since 1951. It is pertinent to note that the *Bisije* area was designated as industrial area by the British due to its flat terrain, relative and its proximity to the road and railway for easy evacuation of agricultural raw materials to *Dadinkowa* river, then to *Numan* and then to the Lagos coast and finally to the British industries at Lancashire. This implies that the concentration of firms in *Bisije* (BCGA) area is a product of an historical process that was economically determined by the British Colonialists.

6. WATER SUPPLY

Water is essential in the existence of all living organisms, man inclusive. However, its significance varies in terms of influencing industrial location. In Gombe metropolis, our oral interviews showed that water diverse roles in location decision as water requirements of industries also vary. Industries such as *Dadaka International Flour Mill*, Furniture making industries and *Niko Plastic* required little or no quantity in their productions; others like *Rice Mills*, Poultry Farms and Ginneries need water in the production processes. Generally, our interviews have revealed that as important as it was, water was not a dominant factor in location decision as it was overshadowed by proximity to market and access road. (interview, 2019). This finding is consistent with a 1969 survey on the importance of water conducted in southeastern Great Britain. Of the approximately 250 responses (from 585 questionnaires), less than five percent of the respondents ranked water as the top priority factor in location decisions. Seventeen percent of the firms responding ranked water within the top three locational factors.

Furthermore, review of several industrial location surveys conducted in the United States in 1973 indicates general consistency with the findings from Great Britain. In a nationwide survey of

1000 of the nation's largest companies, water supply, cost of power and utilities, and water transportation are ranked as the seventh, eighth, and ninth most important locational factors, respectively. Although individual results vary in some aspects, other surveys are generally consistent with these findings and indicate water availability to be less important than several other factors influencing regional location decisions. Numerous surveys in the United States of America indicate that the importance attributed to water availability as a site selection factor varies significantly among types of industry. Those with greatest sensitivity to raw water

availability include food and kindred products (64 percent ranked availability as a critical factor); chemicals and allied products (49 percent); petroleum and coal products (46 percent); wood products (37 percent); and pulp, paper, paperboard, and related products (32 percent). Thus, water availability is viewed as a major site location factor by significant proportions of the firms within certain industrial categories; nevertheless, the survey indicates that a substantial majority of United States industries view water as less than a critical factor in the site location decision. These survey results appear to be a reflection of the fact that water costs generally constitute a small part of total costs of industrial operations, creating the likelihood that other factors accounting for greater portions of total costs will predominate in the location decision. The results also likely reflect the substantial flexibility that most industries possess with regard to quantities of water used (Cox, 1990)

7. ENERGY INFRASTRUCTURE

Electricity was introduced into Gombe in 1961 and since then, many areas were gradually connected with the national grid. As at 2013, Gombe State was benefitting from the 132/33 KV allocated to the North Eastern Region from the National Grid power line originating from Shiroro. The introduction and domestication of the Cluster Concept of Industrial development made electricity a critical factor in influencing location decisions in Gombe Metropolis (Sa'idu and Boyi, 2021). Oil and Rice millers were attracted to Nasarawo industrial Cluster partly due to the fact that the area was connected with blue lines which provide steady and potent electric power required by industries. This position was reaffirmed by the secretary of the Oil Millers Association who stated that prior to the coming of Governor Danjuma Goje, oil millers were scattered in Gombe Metropolis, but in 2008, they were relocated to their current location in Nasarawo which has stable electricity supply (interview, 2018). He further pointed out that initially the cluster had one transformer, about 60-70 shops and 1.5 million as take off capital. As at 2013, the industrial cluster had about 3 transformers and about 200 shops. This implies that electricity infrastructure influences location decision of firms. This trend could be observed in Port Harcourt when in 1965, a Glass Plant was established in the Trans-Amadi industrial estate to take advantage of the available low-cost power from gas being generated by the oil industry.

8. AVAILABILITY OF RAW MATERIALS

Some industries in Gombe State generally and Gombe metropolis in particular were raw material-oriented or rooted industries because their locations were more determined by geographical and economic necessities. For instance, Ashaka Cement Company is located in the North Eastern corner of Funakaye Local Government, because of the availability of Limestone (estimated to be about 34.5 million tonnes). In Gombe metropolis, some sachet water industries locate at the sites where water was relatively available and borehole easy to drill. For instance, Table water industries located in the Bye Pass area of Gombe metropolis were influenced by the availability of water. It should be noted that presence of maize, cotton and other raw materials led to attempts at establishment of industries such as Gombe Flour Mill (Relocated to Bauchi), Gombe Asbestos Company and Cotton ginneries among others.

9. PROXIMITY TO MARKET

Some industries such as the Niko Plastic industry, Dukson Soap and Detergent Factory, Azuma Bottling Company and most of the 78 registered Sachet Water Industries (as at 2013) were sited at their locations due to proximity to the Gombe Central market. This locational decision was informed by the need to minimize the weberian transportation cost of raw materials and finished goods. Paradoxically, the manager of Niko Plastics revealed that most of the big customers were from Borno State (interview, 2018). For industries located in the BCGA areas, the advantage of proximity of market was another critical factor of location. This is in tandem with the findings of Adejomo Fagbohunka's studies on "Firms Location and Relative Importance of Location Factors amongst Firms in the Lagos Region, Nigeria" where market facilities was identified as the most significant among the location factors, it also doubled as the most important advantages offered by locating within the industrial estates.

Closely related to market proximity factor is the population and central geographical location of Gombe Metropolis in North East Nigeria. In terms of population, by 1921 Gombe town has an approximately over 3000 urban population; by 1931 and 1952, the population has reached 13, 30393 and 18, 48394 respectively. By 1963, the population figure had remarkably risen to, 265(57th in the country). In the late 1990s, the population was put at 300,000 (Gombe

MasterPlan, 2030, 2003). This implies that within a span of eighty (80) years, Gombe grew from the size of village with about 300 inhabitants to a state capital of approximately 300,000 inhabitants (i. e. average annual growth rate of 5.9%). Furthermore, Gombe shares boundary with all the other states in the North East geopolitical zone of Nigeria namely: Adamawa, Bauchi, Borno, Taraba and Yobe. It is pertinent to note that the influx of Internally Displaced Persons (IDPs) due to Boko Haram insurgency has further increased the population of the metropolitan area of Gombe and by implication, the viability of markets.

In line with Melvin Greenhut's argument of purely personal considerations as causal factors of location, some manufacturers in Northern Nigeria often locate firms in their places of origins. A good example in this regard is the location of Scopex Industry in Birnin Kebbi because the owner Alhaji Na'amo Abdullahi and his family reside in Birnin Kebbi. Other industries like Abasco Ginnery, Adamu iliyasu Ginnery and Plastic Bag Industry have been sited at Jega because their owners are residents of Jega town of Kebbi State (Muhammad, 2000). However, culture of siting industry in one's place of origin because of patriotism (*kishin yanki /mahaiifa*) was not the norm in Gombe metropolis, because most of the owners of industries cited their factories in Gombe not their villages or local governments of origin. The only industry sited at one's place of origin (outside Gmbe metropolis) was the Manto processing Factory located at Kumo, where a one-time commissioner of Trade and Industry in the former Bauchi State came from (Interview, 2018).

10. CONCLUSIONS

The question of where to locate an industry is crucial to the survival of a firm. Industrial location theorists such as Alfred Weber, Hoover, Losch, and Greenhut among others identified wide range of factors affecting the location decision, including the availability and cost of raw materials, labor, and energy; the occurrence of agglomeration economies associated with concentrations of economic activities; access to product markets; governmental influence exerted to achieve social objectives other than economic efficiency; and behavioral factors associated with individual decision makers. We have demonstrated how these and other factors especially infrastructure such as railway, road, water, and electricity exerted varying influence in the location of Gombe Oil Mills, Landa Sack Factory, Dadaka International Flour Mills, Niko Plastic industry and Dukson Soap and Detergent Factory. However, proximity to market stood out as the most important factor of location. It has been contended that preference of a particular location factor over the other depends on the nature of a particular industry and government policy among other considerations.

RECOMMENDATION

The study recommends that political considerations should be downplayed in industrial location decisions. It is also recommended that diverse stakeholders should be involved in industrial location decisions to arrest penalties associated with poor choice of location. In addition to this, the study recommends provision of adequate infrastructure in places designated as industrial areas.

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