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A Critical Assessment of the Inland Waterways Operations and Management on the Development of the Nigerian Maritime Industry

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Research Article

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ABSTRACT

This paper looks at the nature, characteristics, scope, impact, effects of inland water ways and to ascertain the relativity of the inland waterways operation and management on the development of the Nigerian Maritime Industry at large with much focus on the inland coastal shipping (cabotage) Act of 2003.This paper was modeled on the premise that looked at both primary and secondary sources of information in its data collection. The primary data was obtained from various responses to quantitative and qualitative questionnaires distributed to specialists within and out of the area of research coupled with personal observation. The secondary data was extracted from newspapers, newsletters, seminar/workshop materials, technical and economic journals and unpublished materials that were considered relevant to the study. The hypothetical analysis and test was carried out from the primary information and evaluated using both the qualitative and quantitative method (chi-square test) wherewith certain objective conclusions were reached as stated within the body of the work. Recommendations based on the relative operationality of the inland waterways system via cabotage on the entire gradual development of the maritime sector was likewise given, which would make impact if carefully considered and employed over time. Therefore, this paper will collectively examine the impact of inland water ways to the growth and development of the maritime industry sector in particular and the large Nigerian economy in general.

Keywords: inland waterways, maritime industry, operations and management, Cabotage, Cabotage Act 2003, Cargo.

BACKGROUND INFORMATION

Nigeria has the second longest length of waterways in Africa. It has 8,600 kilometers of inland waterways and an extensive coastland of about 852 kilometers. Nigerians centre on its longest rivers, River Niger and Benue, which cuts across the country into the cardinal east, west and north sections. The two rivers run into each other at Lokoja and flow into the Atlantic Ocean. The coastal waterways extend from Badagry region through Warri to Calabar; however, water transport scores a distant second to road transport with an average share of about 1.6% of Nigeria gross domestic product i.e. internally generated cargoes, although water transport is slow and while unsuitable for passenger movement, an efficient coastal and inland waterways operation and system generally can minimize the pressure on a country's rail and road transport infrastructure (Ndikom, 2008). Inland water transport operation is advantageous in terms of costs of moving heavy traffic; especially where speed is not put in consideration than cost, instance, a single 15-barge tow is equivalent to above 225 rail- road cars or 870 tractor-trailer trucks. This would be of more optimum benefits in the transportation of tonnes of agricultural products from the middle belts areas to the Delta areas via this medium and vice-versa; hopefully bringing about a fall in food prices in the regions, likewise other coastal generated cargo and passenger movements from and to where they are of more value and demand. This mode of transport will equally play an important role in the export and import of raw materials such as materials importation via Delta area ports for use at the Ajaokuta steel complex, which is a major industrial centre on the Niger and will likewise benefits from the importation and use the same route to export its products.

This states that Nigerian inland waterways despite its great potentials are underpriorised, underutilized and highly underdeveloped. The Federal Government currently hopes to reverse this by signing N34.8b contract for the dredging at the lower Niger which covers about 572 kilometers of waterways that stretches from Warri in Delta state to Baro in Niger state in the estimated project which is expected to be concluded by 2010. Likewise the states in

conjunction with Local Government of Lagos and especially Imo whose geared in dredging the River Nworie, although its seen pace is not of encouragement due to factors deemed usually in Nigeria contracts.

The inland waters of Nigeria covering such coastlines and conveying its natural resources such as petroleum, natural gas, tin, columbite etc; and in reserve the country has about 22.5bn meters at crude oil, 3.5 trillion cubic meters of gas and 42.7b cubic meters of bitumen which evaluating the constant activities on the inland waters generates foreign earnings from various maritime components at the respective industries, e.g. oil and gas sector as dominant in the short sea trade estimated at 95% while fishing trawlers and break bulk carriers make up the remaining 5%.

The enormous coastal trade opportunities it present for indigenous shipping companies in Nigeria has overtime failed due to lack of shipping policy in place over the years, directed on such trade. Several, policies initiative are currently directed on the operations and management at inland waterways such as the coastal and inland shipping (cabotage) Act passed 2003. However, it's not enough a thing to initiate policies whereas the management administration or rather the expected enforcement pattern of such policies are not inputted. (Ndikom, 2008).

Generally, inland waterways operation and management goes beyond the technicality and even management aspect surrounding the coastlines, but this study would tend to investigate the impact of the 2003 cabotage Act from the enactment to the present time on the operation of inland water system in Nigeria with view on the various actors and parameters involved in such trade.

A refresh of our minds with some background information on the operating environment would create an appreciable necessity and the importance of cabotage law which is actually the bone of contention. Nigeria having 36 states plus the FCT owing a land area of 924000skm with an estimated population of about 130 million (latest IMF figure). She is blessed with a coastline of about 870km and about 3000kilometer of inland waterways. Nigeria currently has 6 major ports (Tincan Island, Apapa, Warri, Port Harcourt, Onne and Calabar) and 10 crude oil terminals (Escarvos, Bonny, Sapele, Forcados, Tuma, Okrika, FOT, etc). Nigeria Ports Authority (NPA) Annual Account of 1999 showed that traffic into the major ports excluding tankers was estimated at appropriately 3500 vessels per annum and overall cargo throughout (excluding crude) was 22.23 million tones. The total number of passenger that patronizes the sea ports is estimated at 15000 per annum. Also, in 2000 statistics from NPA indicates that 4070 vessels with 121,350,844GRT visited Nigeria, having an overall cargo throughout at 28,859,274 million tones. Sequentially, container traffic at major ports was 119,458 TEUS (outwards) and 204,299 TEUS (inwards); however, several other ports dotted along the 300km of inland waterways includes Onitsha, Oguta, Opobo, Lokoja, Baro, Jebba etc. Nigeria being major oil producing and exporting country records about 1,000 petroleum tanker vessels calling at her ports annually, with an average tanker size of about 95000 GIRT. Pause and reflect on the import and export statistics in terms of numerous trade opportunities and the never- ending operations on the Nigerian coastal ways nationwide. Such transport or activities over waterways is especially effective when the source and/or destination are a water front location, which is a main infrastructural advantage that regularly needed to be trained, maintained and upgraded, of which Nigeria is specially blessed with such infrastructure as waterways unlike the hinterland states. The Nigeria inland waterways operations and management has long since time immemorial been in service but are yet to meet with her states expectation seeing the various natural features on ground as tools to facilitate its operations.

This study is all about the critical evaluation of the operations and management of the Nigeria inland waterways system with emphasis on the coastal shipping (cabotage) Act, its formation purposed and implementation effected or not.

Statement of Problem

Nigeria aspires to be amongst the top 20 largest economics by the year 2020 according to the economics policy at vision 2020 and successful operations and management of the inland waterways by the actual implementation at the enacted cabotage laws in Nigeria is critical to the success or otherwise of the plan because of the indispensible role shipping plays in not just the movement of goods and services around the country and the revenues collected as tax from the various actors in the sector.

The expected cabotage Act impact on the state by catalyzing the growth and development of the transportation factor due to the over dependence of the nation on road transportation operations and its consequent damage of the roads since the collapse of the railway system in Nigeria. The growth however are expected when the dredging activities currently going on in the nation's inland waterways are concluded and other factor later discussed as constraints on this study are considered.

However, the initiatives and strategies forecasted for the future still does not move a foot if the problem of enforcement geometrically progresses due to the infallible and unchangeable management governing the corridors of power in this sector, seeing actually that most of them still lack the rudimentary understanding of its existence and

likewise its operationality (Ndikom, 2006). This could be the genesis if we are ever to get to the revelation of improvements. A critical assessment on the operations and management of the Nigeria inland waterways would generally center on the coastal and inland shipping (cabotage) Act which was passed into law on the 30th April 2003. The significant contribution of the maritime sector to the socio-economic and political development of Nigeria cannot be over-emphasized; of major significant to the Nigerian economy is the maritime sector with about 100kilometers of navigable waterways added to the numerous lagoons and channels with deep waters.

Despite the tremendous contributions and level of economic activities revolving around the coastal waters, one would assume that Nigeria is a major maritime nation, sadly and unfortunately this is not the case which is greatly published through the problems experienced by the operations and management of the cabotage policy in our inland waterways systems of Nigeria. Actually, cabotage policy has not fully be practiced in Nigeria because at present it's faced with the problems of proper operational implementation and lack of infrastructural facilities; although the effectiveness and efficiency of cabotage will improve the Nigeria shipping industries, eliminate competition between indigenous and foreign shipping, improves the economy and National coastal security.

Inland waterways operations and management would be more recognized and appreciated if not globally when the cabotage policies related to all its sectors are fully reasonably enforced. To this the objectives of the study are as under listed in the next section.

Objectives of the Study

The specific objectives of the study include;

- To determine the extent at which lack of adequate infrastructures and funding effects the implementation of coastal shipping in Nigerian territorial waters.
- To evaluate the extend to which the initial adoption of cabotage law may result in higher cost of cargo movement activities along the coast in its operational and managerial activities.
- To investigate the effectiveness and efficiency of the cabotage Act on the operational and managerial activities of the inland waterways in Nigeria over the years.
- To evaluate the nation's level of involvement and concern towards the inland waterways operations and management through coastal shipping (cabotage Act).

Research Questions

These questions shortlisted below are general footing for guidelines and structural focus on the study.

- How effective and efficient have Nigeria inland waterways operations and management been over the year?
- Cabotage Act, what actually does it hold for the maritime industry, relative to inland waterways operation?
- The maritime industry of Nigeria, what is the way forward via the inland waterways operation and management?
- Is cabotage the last option for the maritime industrial development via inland waterways?

Hypothesis

- Lack of adequate infrastructure will hinder the operational and management of inland waterways system.
- Will the absence of necessary technical infrastructure and funding hinder the implementation of cabotage policy in Nigeria?
- The effective and efficient cabotage law would boost the operations and management of inland waterways in Nigeria.
- The cabotage regime probably would be smoothly affected without the wavier clause attached.

Justification of the Study

A cross analysis of how much a range the cabotage Act covers with relatives to Nigeria inland waterways operations and management gives it of paramount to study how much of impact after close to 8 years of enactment it has on the maritime industry and its purpose on Nigeria.

Likewise, is aimed at critically analyzing some aspects of the cabotage policy, its flaws and needed attention from the government, and moreover will be of immense benefit to both the layman and professionals to be giving a clear picture of the cabotage intentions.

METHOD

Research Design: This is a cross sectional survey research design which involves the use of questionnaire, and was adopted in this study using simple randomly sampling technique; a total of fifty respondents were drawn from the operations and management of inland waterways within the ambiance of the South East of Nigeria. The design was chosen because it provides an appropriate methodology for opinion and perception of the benefits accruable from the operations of inland waterways in terms of growths and development of the region's economy.

Instrumentation

A self- developed closed-ended 21 items questionnaire entitled "A critical assessment of the inland waterways operations and management on the development of the Nigerian maritime industry was developed and used for data collection. The questionnaire was structured to generate information with respect to research questions and hypothesis earlier stated. Content validity for the instrument was ascertained by technocrats and professionals within the maritime industry. The liability was ascertained using the test-retest method with an intervening interval of one week between the first and second administration of the questionnaire. The liability coefficient of 3.84 was obtained. Also the study used a Chi-square method in analyzing its data which reflected 0.95 or X2 (tabulated) =0.99, which is a critical value at 5% or 0.05 significance level.

Method of analysis

Obviously, only fifty (50) copies of questionnaire were collected as properly completed from one hundred distributed initially, which were analyzed for the purpose of the study. The liability coefficient of 3.84 was obtained. Also the study used a Chi-square method in analyzing its data which reflected 0.95 or X^2 (tabulated) =0.99, which is a critical value at 5% or 0.05 significance level. The X^2 was preferred because it addresses research problems involving frequencies where the variables have been categorized into two or more mutually exclusive groups within the operational modalities of the maritime industry.

Data Analysis and Testing of Hypothesis

Table 4.1: **Tabulated responses**

Serial No	Respondent choice	No. of responses	% of Responses
1.	Yes	35	70
	No	5	10
	Uncertain	10	20
2.	Yes	40	80
	No	2	4
	Uncertain	8	16
3.	Yes	12	24
	No	33	66
	Uncertain	5	10
4.	Yes	28	56
	No	11	22
	Uncertain	11	22
5.	Yes	42	84
	No	4	8
	Uncertain	4	8
6.	Yes	29	58
	No	1	2
	Uncertain	30	40
7.	Yes	20	40
	No	15	40
	Uncertain	15	30
8	Yes	28	56
	No	2	4
	Uncertain	20	40

Continuation of table 4.1

9	Yes No Uncertain	7 30 13	14 60 26
10	Yes No Uncertain	5 29 16	10 58 32
11	Yes No Uncertain	25 20 5	50 40 10
12	Yes No Uncertain	26 3 21	52 6 42
13	Yes No Uncertain	16 17 17	32 34 34

Source: Quantitative part (section A) of questionnaire; 2011.

Test of Hypothesis

The chi-square test (X^2)

Definition:Chi-square test (x^2) is a measure of discrepancy existing between the observed and expected frequencies of random sample. The frequencies are supplied by statistics via the questionnaire.

Mathematically: Chi-square, x^2 is given by

x^2 (computed) = $(Fo_I - Fe_I)^2 + (Fo_J - Fe_J)^2 + (Fo_k - Fe_k)^2$
$= \sum_{j=i}^{k} \frac{(Foi-Fej)2}{Fej}$

If the total frequency is N: $\Sigma Fo_i =$ $\Sigma Fe_i = N$

Fo_i = observed frequency
Fe_i = expected frequency
If X^2 (computed) = O; observed the radical frequencies agree
While X^2 (computed) > O; means that they do not agree

Null Hypothesis: H_o: This is the hypothesis that is being tested and it is denoted by Ho.

Alternative Hypothesis, H_A: This is the hypothesis that will be accepted, if rejected based on the certain conditions of method applied during analysis, the Null hypothesis is then called the alternative hypothesis, H_A.

Significance Test

In practice expected frequencies are computed on the basis of a hypothesis, Ho. If under this hypothesis the value of X^2 (computed) is greater than some critical value such as X^2 (tabulated) = 0.95 or X^2 (tabulated) = 0.99, which is critical value at 5% or 0.05 significance level, we would conclude that observed frequency differ significantly from expected frequencies and would reject Ho at the corresponding level of significance. Otherwise, we would accept it or at least reject it.

Testing hypothesis 1

Null (Ho): That lack of adequate infrastructure will hinder the operation and management of inland waterway system.

Alternative (H_A): That lack of adequate infrastructure will not hinder the operational and management of inland waterway system.

Table 4.2: **Contingency table 1**

	Yes	**No**	**Total**
Directors	34	6	40
Operational Staff	6	4	10
Total	40	10	50

Responses	Yes		No		
	Observed	**Expected**	**Observed**	**Expected**	**Total**
Director	34	32	6	8	40
Operational staff	6	8	4	2	10
Total	40	40	10	10	50

Source: Field survey, 2011.

Expected frequency = Row total X column total / Grand total

$\varepsilon 34 = \frac{40 \times 40}{50} = 32$

$\varepsilon 6 = \frac{40 \times 10}{50} = 8$

$\varepsilon 6 = \frac{10 \times 10}{50} = 8$

$\varepsilon 4 = \frac{10 \times 10}{50} = 2$

Deduced from the formula of chi-square (X^2)

$$X^2 \text{ (computed)} = \frac{(34-32)^2}{32} + \frac{(6-8)^2}{8} + \frac{(6-8)^2}{8} + \frac{(4-2)^2}{2}$$
$$= 0.125 + 0.5 + 0.5 + 2.0$$
$$= 3.125.$$

Deduced from the formula of chi-square (X^2)

X^2 (computed) = 3.841

There the tabulated value of X^2 is greater than the computed value of X^2, hence X^2 (tabulated) > X^2 (computed) i.e. 3.841 > 3.125; hence the Null (Ho) is accepted and the Alternative (H_A) is rejected.

This simply implies that lack of adequate infrastructure will hinder the operations and management of inland waterways system.

Testing Hypothesis 2

Null (Ho): that lack of necessary technical infrastructure and funding will not hinder the operations and management of inland waterways system.

Alternative (H_A): that lack of necessary technical infrastructure and funding will hinder the implementation of cabotage policy in Nigeria.

Table 4.3: **Contingency table 2**

	Yes	**No**	**Total**
Directors	31	4	35
Operational Staff	4	11	15
Total	35	15	50

Responses	Yes		No		
	Observed	**Expected**	**Observed**	**Expected**	**Total**
Director	31	24.5	4	10.5	35
Operational staff	4	10.5	11	4.5	15
Total	35	35	15	15	50

Source: Field survey, 2011.

Expected frequency = Row total X column total / Grand total

$\varepsilon 34 = \frac{35 \times 35}{50} = 24.5$

$\varepsilon 6 = \frac{35 \times 15}{50} = 10.5$

$\varepsilon 6 = \frac{35 \times 15}{50} = 10.5$

$\varepsilon 4 = \frac{15 \times 15}{50} = 4.5$

Deduced from the formula of chi-square (X^2)

X^2 (computed) $= \frac{(31-24.5)^2}{24.5} + \frac{(4-10.5)^2}{10.5} + \frac{(4-10.5)^2}{10.5} + \frac{(11-4)^2}{4.5}$

$= 1.725 + 4.024 + 4.024 + 9.389$

$= 19.162$

That is (R-1) (C-1) = (2-1) (2-1) = 1

X^2 (tabulated) = 3.841

Here the computed value of X^2 is greater than the tabulated value of X^2, hence X^2 (computed) > X^2 (tabulated) i.e. 19.162 > 3.841. Therefore the Null (Ho) is rejected and the alternative (H_A) is accepted. This simply means that lack of necessary technical infrastructure and funding will hinder the implementation of cabotage policy in Nigeria.

Testing Hypothesis 3

Null (Ho): the effective and efficient cabotage law would not boost the operations and management of inland waterways in Nigeria.

Alternative (H_A): the effective and efficient cabotage law would boost the operations and management of inland waterways in Nigeria.

Table 4.4: **Contingency table 3**

	Yes	**No**	**Total**
Directors	20	8	28
Operational Staff	8	14	22
Total	28	22	50

Responses	Yes		No		
	Observed	**Expected**	**Observed**	**Expected**	**Total**
Director	20	15.68	8	12.32	28
Operational staff	8	12.32	14	9.68	22
Total	28	28	22	22	50

Source: Field survey, 2011.

Expected frequency = Row total X column total
Grand total

ε20 = 28 X 28 / 50 = 15.68

ε8 = 22 X28 / 50 = 12.32

ε8 = 28 X 22 / 50 = 12.32

ε14 = 22 x 22 / 50 = 9.68

Deduced from the formula of chi-square (X^2)

X^2 = (computed) = $\frac{(20-15.68)^2}{15.68} + \frac{(8-12.32)^2}{12.32} + \frac{(8-12.32)^2}{12.32} + \frac{(14-9.68)^2}{9.68}$

= 1.190 + 1.5115 + 1.515 + 1.928
= 6.148
That is (R-1) (C-1) = (2-1) (2-1) = 1
X^2 (tabulated) = 3.841

Here the computed value of X^2 is greater than the tabulated value of X^2, hence X^2 (computed) > X^2 (tabulated) i.e. 6.148 > 3.841, therefore the Null (Ho) is rejected and the alternative (H_A) is accepted. This simply means that the efficient and effective cabotage law would boost the operations and management of inland waterways in Nigeria.

Testing Hypothesis 4

Null (Ho): the cabotage regime probably would not be smoothly affected without the waiver clause attached.

Alternative (H_A): the cabotage regime probably would be smoothly affected without the waiver clause attached.

Table 4.5: **Contingency table 4**

	Yes	**No**	**Total**
Directors	25	10	25
Operational Staff	10	15	25
Total	25	25	50

Responses	Yes		No		
	Observed	**Expected**	**Observed**	**Expected**	**Total**
Director	15	12.5	10	12.5	25
Operational staff	10	12.5	15	12.5	25
Total	25	25	25	25	50

Source: Field survey, 2011.

Expected frequency = Row total X column total
Grand total

ε15 = 25 X 25 / 50 = 12.5

ε10 = 25 X25 / 50 = 12.5

ε8 = 25 X 25 / 50 = 12.5

ε14 = 25 x 25 / 50 = 12.5

Deduced from the formula of chi-square (X^2)

X^2 = (computed) = $\frac{(15-12.5)^2}{12.5} + \frac{(10-12.5)^2}{12.5} + \frac{(10-12.5)^2}{12.5} + \frac{(15-12.5)^2}{12.5}$

= 0.5 + 0.5 + 0.5 + 0.5
= 2.0

That is (R-1) (C-1) = (2-1) = 1
$\rightarrow X^2$ (tabulated) = 3.841

Here the computed value of X^2 is less than the tabulated value of X^2, hence X^2 (tabulated)> X^2 (computed i.e. 3.841 > 2.0, therefore the Null (Ho) is accepted and the alternative (H_A) is rejected. This means that the cabotage regime probably would not be smoothly affected without the waiver clause attached.

CONCLUSION

In this study the research has been assessed in collaboration with the existing concept enumerated within the body of the work. More so, the result has also adopted both quantitative and qualitative approach of research analyzed. The result of the analysis in this study has provided adequate answers to the research questions preferred and has validated research hypothesis. Finally, valid conclusions have been made or drawn towards achieving the objective of this research.

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Examples:
Abayomi (2000), Agindotan et al. (2003), (Kelebeni, 1983), (Usman and Smith, 1992), (Chege, 1998;
Chukwura, 1987a,b; Tijani, 1993,1995), (Kumasi et al., 2001)