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**Survey on the inclusion of Cumulative Impact Assessment in Oil and Gas Environmental
Impact Assessment reports in Nigeria**

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ABSTRACT

It is well understood that there are cumulative impacts for development projects so there is a need for projects to incorporate cumulative assessments in their Environmental Impact Assessment reports. It is based on this understanding that this study investigated the inclusion of cumulative impact assessment in oil and gas development project EIA reports in Nigeria between 1994-2019. The study utilised the Burris and Canter (1997) model in assessing the level of Cumulative impacts assessed in 33 Environmental Impact Assessment reports examined. Results show that 48.48% of the reports neither mentioned nor assessed cumulative impacts, 33.33% did mention cumulative impacts but did not assess them while 18.18% mentioned and assessed cumulative impacts. Results also reveal that cumulative impact evaluation improved from the year 2015. There is an indication that there is an increase in awareness of cumulative impacts as seen by the number of reports that incorporated cumulative impact investigation. The paper recommends that cumulative impacts of major developments be reviewed by various independent reviewers and updated evaluation criteria should be used in assessing the quality of cumulative impact assessments in EIA reports considering current realities. Furthermore, project planners should anticipate the possibility of cumulative impacts in a project and address their concerns at the initial stages of project planning prior to project registration.

1 INTRODUCTION

Cumulative effects (CE) or Cumulative Impacts (CI) in environmental regulation began in the 1970s and have grown increasingly in its considerations in Environmental Impact Assessment (EIA) and Management (Canter & Bill, 2010). Over the years, evaluation and assessment of CIs have been quite a challenge especially as there are still no generally accepted methodologies for its assessment (Duinker, Burbidge, Boardley & Greig, 2012). Nonetheless, Canter and Sadler (1997) described a three (3) way process that could be used to address CEs. These 3 steps include-delineating the potential sources of a cumulative change, identifying the pathways of possible change and classifying the resultant cumulative changes.

CE emerged when it was realized that proposed developments should take account of it and should not be assessed in isolation (Canter & Bill, 2010). The Council of Environmental Quality (CEQ) defines cumulative impacts (CIs) as those impacts on the environment resulting from an increase of the impact on the environment when added to past, present and reasonably foreseeable future actions. In other words, CEs are changes to the environment as a result of a combination of the past, present and future human activities and natural processes. Their individual direct impacts may be minor; however, multiple activities in combination could result in significant environmental effects. These multiple impacts may be additive (equal to the sum of individual effects), synergistic (total effect is greater than the sum of individual effects) and antagonistic (individual effects neutralize each other). CIs are usually difficult to predict and manage due to ecological processes, lack of baseline information and the large scale at which human development occurs (Clark, 1994). Additionally, natural occurrences, which contribute to CIs, could be almost impossible to predict and even when such predictions occur it may be difficult to objectively estimate the degree at which this occurrence will impact on CEs.

While the need and importance for cumulative impact assessment (CIA) has been established, there are barriers to their assessment and management. Additionally, much work is needed in the integration of CIA into environmental regulations. Moreover, CIA studies are often tedious and time insufficient (Cooper & Sheate, 2002). Other challenges in CIA include; limited information on proposed development due to commercial considerations, stakeholders varying priorities of valued environmental components (VECs) stakeholder engagement can be sometimes counterproductive especially when prompted by a certain sponsor or developer, lack of available VEC baseline conditions and threshold values, uncertainties, project sponsor refusal to accept responsibilities, impact management issues, data confidentiality and lack of sharing of data collaboratively (International Finance Corporation (IFC), 2012). Typically, the project specific nature of most impact assessment works results in data that are not usually in line with what scientists need to assess CIs effectively and thus scientist assess CIs through the responses of the ecological components to stressors. On the other hand, decision makers are more focused on understanding connections which exists between human activities and stressors (Clarke, Mach & Martone, 2014). Debates on what methods to use to assess CIs are concerned with what the appropriate geographic and temporal boundaries should be to adequately assess CIs. Several researchers have proffered solutions to the challenges in assessing CIs in EIA. These include assessing CIs at the policy, program or sector level as there is a need for long term planning; in other words, moving away from project specific environmental assessments, coordination among jurisdictional agencies, developing an

environmental database for baseline information (Clark, 1994), incorporating Regional Environmental Assessment (REA) studies (Connelly, 2011) and early detection of CIs (Durdan *et. al.*, 2018) which can be fostered by early community participation. The aim of this study is to evaluate the level of CIA inclusion in selected oil and gas development projects EIA reports. This appraisal would be essential to project owners as CIA in reports is a measure of report quality. Unfortunately, there are limited studies on CIA appraisal in EIA reports.

The United States, even after several years of CIA being a requirement, considered them marginally (Burris & Canter, 1997). The reason for the lack of consideration of CIs was the fact that the CEQ did not provide methods or guidance for their assessment (Burris & Canter, 1997). Other deterrents include; limited policies and methodologies available for assessing CIs, a lack of a coordinated land use planning, lack of and limited initiative and direction from federal agencies and lastly study constraints which are related to funding and time (Burris & Canter, 1997). CIA is an evolving component of environmental studies and there is no single accepted state of global practice (IFC, 2012). What is of importance is that during a development, project owners, developers or sponsors are aware that their actions may contribute to CIs on VECs and thus should try to avoid or minimize these impacts to the barest minimum. Good practice requires that project owners assess contributions on projects on VECs or the resulting environment that VECs depend on.

14 EISs and 30 Environmental Assessment (EA) Reports from a variety of project types were reviewed to study the general trends on CIA in the US by Burris and Canter (1997). The review was based on a set of developed criteria. Results from this study revealed that CIs are not normally mentioned neither are they adequately addressed. Only 14 (47%) EA reports even mentioned the term while 6 (20%) indirectly assessed them. Meanwhile, only 7 (23%) EA Reports discussed CIs in the section on environmental consequences and 5 (17%) addressed the topic in other areas of the document. The 14 EA Reports that used the term 'cumulative impacts' was further analysed in the Burris and Canter (1997) study. 7 (50%) of the 14 EA Reports included CIs in the environmental consequence section however, only 2 referenced CIs throughout the section. CIs that were mentioned were addressed qualitatively without considerations of spatial and/or temporal boundaries. Essentially, the review showed that neither the documentation of CIs considerations or the level of assessment of CIs analysis was sufficient. Additionally, a systematic consideration and assessment of CIs was not found in the 30 EA Reports and the generally low percentages of affirmative responses to the 17 criteria questions depicted an overall lack of attention to CIs. The criteria list is presented in **Table 1**. Furthermore, the findings from this study is similar to those from the review of 89 EAs reviewed by McCold and Holman (1995) (Burris & Canter 1997).

Burris and Canter in another survey involving 54 practitioners both within (25) and outside (29) the US had similar conclusions on CIA. The domestic results revealed that 53% of CIs were not directly or indirectly assessed, about 29% assessed CIs directly while a little over 18% assessed them indirectly. Results from the International survey showed that 78% did not assess CIs directly or indirectly, a little over 15% addressed CIs while about 6.6% addressed the impacts indirectly.

2 METHODOLOGY

2.1 Data

Reports reviewed were obtained from Shell Petroleum Development Company (SPDC). The data set consist of 33 oil and gas development Projects reports selected by convenience sampling from 1994 to 2019 mainly from the core Niger Delta states (Rivers, Bayelsa and Delta). One reviewed report was from Abuja FCT.

2.2 Method

The study used the Burris and Canter Model (1997) for CIA evaluation. The Model forms a step by step process in determining the level of CIA assessment presented/documentated in EIA Reports.

3 RESULTS

The results are presented in **Figure 1 and 2**.

The results reveal that 48.48% of the reviewed EIA Reports had No Mention (NM) of neither CIs nor CIA. 33.33% of the reports reviewed mentioned (CM) CIs and CIA but did not assess these impacts while 18.18% mentioned CIs and assessed them (CA). Cumulative impacts that were mentioned but not assessed were included in the table of contents and as part of the objectives of carrying out the EIA. CIs that were assessed where mentioned in the Table of Contents, Executive Summary, Project objectives, environmental consequences, the scoping section and relevant areas of the documents, e.g., mitigation. Larger development projects like the Assa-North Ohaji-South (ANOH) project, had a more detailed discussion of CIs in the scoping of environmental impacts section as well as other areas of the report. Furthermore, CIs were qualitatively and quantitatively defined, had predictions and forecast made on the impacts, had predictions of CIs from previous studies, addressed transboundary and global issues as well as had guidelines and CIA methodologies. For these

reasons, the ANOH project had the best assessment of CIs. Figure 2 shows the trend in CIA consideration from 1994-2019. There was consistency in the lack of CI mention from 1994-1999, to inconsistencies between mentioning CIs and not referring to them at all from 2000-2015. It is apparent that CIA became consistent from the year 2015.

4 DISCUSSION

From the assessment, it would be expected that CI considerations would progress with each coming year; however, this was not the case. For example, a 1999 EIA report mentioned CIs whereas a 2002/2003 report did not. Similarly, a 2004 report mentioned CIs while a 2010/2012 report did not. The year 2015-2019 showed a consistency in CIA evaluation. This means that project owners have taken on board the need for CIA in oil and gas projects. The ANOH report had a more elaborate and detailed CIA comparatively. Perhaps this was due to the nature of the project and the fact that two giant international oil companies were responsible for the project. Therefore, there would be double the resources available to conduct a CIA unlike a project carried out by a single company. CIA studies are known to be expensive, time consuming and require a lot of expert knowledge. Without available resources, it would be difficult to conduct CIA adequately. Findings from this study are similar to studies from Burris and Canter (1997) and McCold and Holman (1995) in that a greater percentage of EIA Reports do not mention CIs and reports that mention them rarely assesses them. This notwithstanding, CI considerations and assessment for this study showed that this area has improved over time.

The ANOH (2016) report had the best quality of CIA. One outstanding feature of this report is that it assessed in detail the cumulative impacts of the project on all environmental receptors including its impact on climate change by incorporating Strategic Impact Assessment (SEA) strategies especially in the area of its mitigation measures. It adequately assessed the CIs on all important VECs using tools and methodologies which were appropriately documented in the report. Each method and result were given justification and every instrument used for established significance was appropriately explained. The Report placed reasonable benchmarks as to how far into the past and how far into the future CIs needed to be assessed. It used reports as far back as 1986 (for its land use assessment) and used the lifespan of the project (30 years) for its futuristic predictions. Furthermore, it included an additional 5 years to ensure residual impacts are part of the assessment. This report incorporated elements of SEA in conducting its CIA and did state that EIA on its own was incapable of assessing CIs. Its method of assessment included; expert judgments and computer simulations and models that had good predictive capabilities.

Several authors have advocated that CIs be addressed through SEA. SEA is an assessment that is applied to policies, plans and programs. It has similarities in terms of its stages with EIA; however, it is more strategic and is a broader tool in environmental impact evaluation. Several researchers have argued with reliable results that at the SEA level of assessment, CI issues can be addressed as EIA as a tool is not strong enough to handle the requirements of a successful and comprehensive CIA (Duinker & Greg, 2006, Duinker & Greg, 2007, Dube, 2003, Duinker *et. al.*, 2013, Bragagnolo & Geneletti, 2012). Thus, for CIA to be properly assessed it has to be handled at the SEA level. Furthermore, early detection of projects that require CIA should suffice from the screening stage of the EIA process. Each project should be categorized according to set of evaluation criteria. This phase, the scoping phase 1 is also recommended by IFC guidelines (2012).

5 CONCLUSION

Based on the findings from this study, project proponents in the oil and gas industry have incorporated CIs in their assessment and documented their findings in the EIA reports. This indicates that there is a growing awareness on the need for CI evaluation. Incorporating SEA in project-EIA is necessary in achieving the level of cumulative impact investigation documented in the Assa-North Ohaji-South (2016) project. Report developers should take learnings from this report and incorporate its methods into similar projects. Furthermore, it is important that CIA appraisals in EIA reports are done more regularly to ensure improvements or at least consistency in CIA inclusion.

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Table 1: Criteria Questions on CIs for the assessment of EA Documents

Criteria questions

Are CIs listed in the Table of Contents, Abstract, index or executive summary?

Are CIs discussed in the Environmental Consequences section?

Are CIs addressed anywhere else in the document?

Are CIs discussed separately for each environmental resource defined for the project?

Are CIs addressed only for environmental resources determined to be negatively affected by the project?

Is there a summary of the CIA of the project?

Is there a written definition of CI?

Are CIs addresses in the scoping section?

Are CIs listed in their own section?

Are CIs qualitatively or quantitatively described? Quantitatively and qualitatively? Qualitatively only?

Are spatial boundaries considered in the in the CIA Process?

Are temporal boundaries considered?

Does the CIA consider all other projects in the defined boundaries?

Are specific guidelines and methodologies described for the CIA?

Are predictions of prior CI studies in the project area incorporated into the CIA process?

Are transboundary issues addressed?

Are global issues addressed?

Are specific guidelines or methodologies used to assess transboundary/global issues?

Source: Burris and Canter (1997)

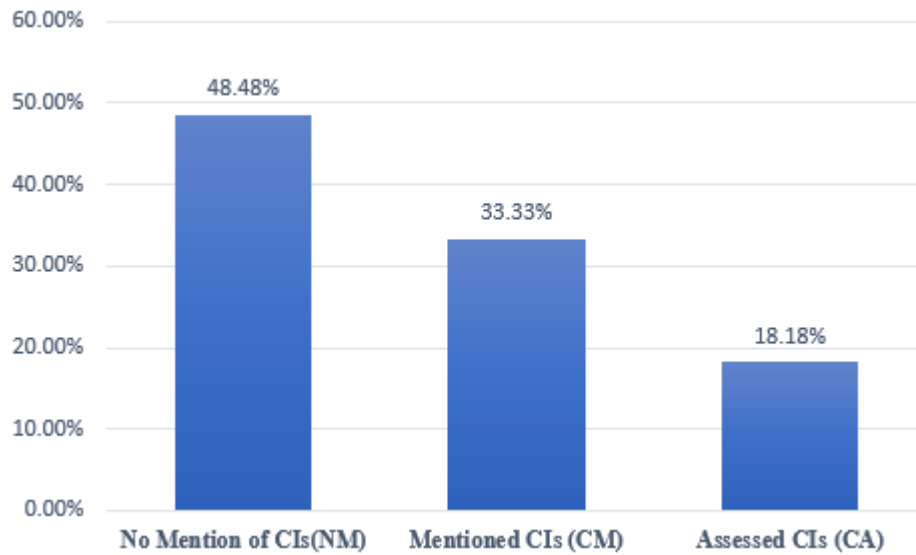


Figure 1- Examination of CIA across the EIA Reports

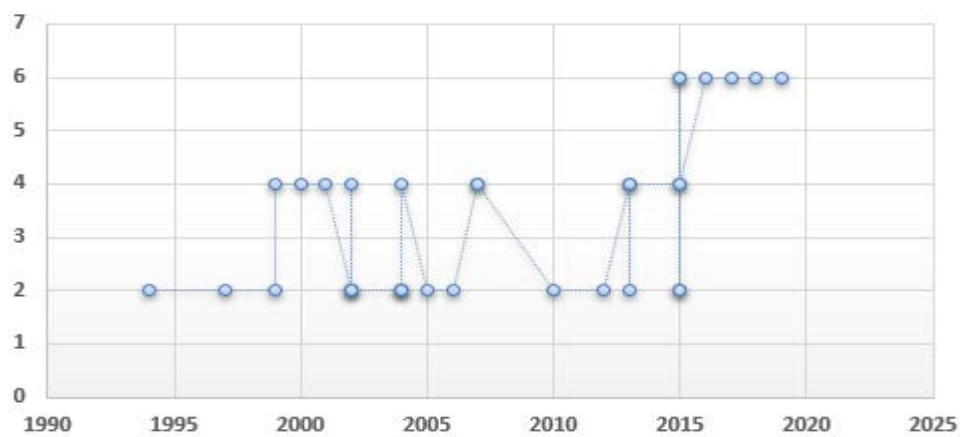


Figure 2 -CIA trend from 1994-2019

LEGEND

2	NM
4	CM
6	CA