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# SOCIAL RESEARCH TRIANGULATION AS A DOUBLE-EDGED SWORD: EMPIRICAL SAMPLER FROM THE EDO STATE COMMAND OF NIGERIA SECURITY AND CIVIL DEFENCE CORPS' ANTI-VANDALISM OPERATIONS

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**Abstract**
This article examines the challenges and opportunities inherent in the application of triangulation in social research. In unravelling the double-edged nature of triangulation usage, the study assesses the performance of the Nigeria Security and Civil Defence Corps (NSCDC)'s anti-vandalism operations in Edo State as an empirical sampler. The study relied on a combination of qualitative and quantitative research instruments for data generation. The triangulation of dual research methods yielded mixed results, spewing up methodological and practical challenges in the study including the expenditure of huge resources, time and efforts. Despite these challenges, the use of triangulation provided opportunities for actual confirmation of validity of measures and research findings as well as gaining broader and deeper understanding of the phenomenon under assessment. In particular, the use of multiple methods and data sources neutralized the weaknesses of a single research method and strengthened the overall research outputs. Thus, the article advocates the use of triangulation not just for greater research validity and reliability, but also for overall credible research outcomes and nuanced knowledge production.
**Keywords:** Research, social research, triangulation, validity

## Introduction

Social researchers are increasingly generating various ways of producing more robust and reliable research outcomes. One of the ways researchers have sought to achieve this over the years is through the adoption of triangulation. As social science researchers are expected to test theories and produce reliable and valid results that approximate reality, triangulation has gained much popularity as a way to fulfill this epistemic expectation. Traditionally, the use of triangulation in the study of social phenomena has been largely associated with qualitative research in which the researcher is very close to the research data, which makes the risk of subjectivity high. Thus, the quest to mitigate biased data prompted the use of triangulation.

It has been contended that the use of triangulation has gained significant attention amongst scholars and researchers in social sciences than in humanities. This is essentially because in the humanities, methodology has been considered of less significance than in the social sciences. Intellectual attention in which the use of triangulation has gained importance in social research is indicative in the claim by some researchers that it is a third research method in addition to qualitative and quantitative research methods. As a new and growing research standpoint, triangulation is variously branded multi-methods (Brannen, 1992), mixed methodology (Tashakkan & Teddlie, 1998), mixed methods (Creswell, 2003; Tashakkan & Teddlie, 2003) or multi-strategy (Bryman, 2004).

The key objective of this study is to examine the challenges and opportunities of the uses of triangulation in social research. In terms of methodology, the article is based on empirical study of the limiting factors on the performance of the NSCDC in its anti-vandalism campaign in Edo State. The primary data is complemented with desk information derived from textbooks, journals and other archival materials. The article, for the purpose of clarity, is structured into seven sections. Following this introductory section is the conceptual review on research. The third section highlights the steps on how to conduct triangulation, while the fourth examines the application of triangulation using the performance of the NSCDC's anti-vandalism campaign as an empirical sampler. The fifth and sixth sections unravel the challenges and opportunities of using triangulation respectively, while the seventh section concludes with some remarks and recommendations.

## Conceptual Review

In this article, three concepts are central which need to be clarified or reviewed for the purpose of comprehension of the discourse. These concepts are research, social research, and triangulation.

## Research

Research denotes a systematic or scientific enterprise which investigates phenomena for better understanding or solutions spewed up by them. It also helps to validate or refute existing knowledge. It is a process of reaching a dependable solution to a problem through planned and systematic collection, analysis and interpretation of data (Mukoro & Jeroh, 2023; Osuola, 2003; Efoghe, 1994). It is thus a systematic investigation into a phenomenon for the purpose of knowledge production in line with the method, principles and standards in a particular discipline or profession (Mukoro & Jeroh, 2023). Just as musicians produce music, farmers produce food items, researchers also produce knowledge. Although a research often entails a vigorous investigation, it is not every vigorous study that is research. To produce knowledge, one needs information. However, information and/or even knowledge may be fake. To mitigate the vulnerability to fake information or knowledge, there is need to be circumspect in sourcing and processing information for knowledge production in order to minimize the destructive effects of fake or spurious information on the society (Azelama, Osumah & Azelama, 2022).

Research has been categorized using different instruments of classification, including the purpose of the research, the method or research design adopted, and whether the phenomenon has already taken place or it is expected to take place in the future, etc. In the classification done hereunder, an attempt is made to discuss the various types of research acceptable in the social sciences as well as in the management science and education which also largely adopt the social science research methods (Azelama, Osumah, & Azelama, 2022).

**Experimental Research:** This is the research usually conducted in the laboratory. It is conducted to determine cause-effect relationship. There are usually two groups of the subjects; the experimental group and the control group. However, while the experimental group receives the treatment or variable being tested, the control group does not. This is to establish if the effect is caused by the introduction of stimulus to the experimental group. The change or effect in the experimental group which is not in the control group is therefore attributed to the stimulus. In the social sciences, experimental research is mostly used in the discipline of psychology. Similarly, a quasi-experimental research is one in which although there are the two groups as in experimental research, however, the subjects in the two groups are not randomly selected.

**Field Survey Research:** This is a non-experimental research design or survey method in which information or data can be collected with the use of questionnaire (instrument) or focus group discussion or interview (Osuola, 2003). Perhaps, the most commonly conducted survey method is one in which questionnaire is the instrument used. When the instrument or questionnaire is designed to measure observations of variables at a specific point in time, then it is referred to as a cross-sectional survey. However, if it is designed to measure repeated observations of the variables over long periods of time, it is referred to as a longitudinal survey.

**Social Research**

Social research has been defined as a systematic activity by means of logical methods to unearth new or old facts and analyze their sequence, interrelationship, casual explanation and the natural law governing them (Brians, Willnat, Manheim, and Rich, 2011). Social research is the investigation of social trends, dynamics and principles that exist between individuals and groups in the society. The purpose of social research is to deepen the understanding of social factors that motivate and influence human beings and to analyze how and why they interact with each other. Social research is the systematic and objective analysis and recording of controlled observation that may lead to development of generalization, principles, or theories which result in prediction (Efoghe, 1994). Social research entails the systematic provision of solution to existing social problems. Instructively, the process may not succeed in providing permanent solution to such identified social problems. Where such problems are not readily solved, further research is called for until relatively permanent solutions are found.

Social research procedures help to synthesize new ideas through testing of hypotheses and skillful application of scientific prescriptions. It helps the researcher to study social phenomena in a rigorous manner with a view to making their findings approximate reality. Social researchers often ensure that their studies conform with the rudimentary principles of scientific method which denote the sequence of steps that a scientist must take in the course of gathering information about the universe (Creswell 2003).

Unlike other forms of research, social research involves the use of human beings as subjects and reference points. Human beings unlike inanimate objects are not passive objects which are incapable of responding to external or internal manipulation or stimulation in the course of conducting a study. Human beings are capable of inferring motives, attributing responsibilities, and responding positively or negatively to stimuli. As a result, social research usually involves adherence to ethical principles to limit unintended influence at any stage in the research process (Aghedo, 2013; Efoghe, 1994).

There are several methods of social research. Some of the notable social research methods that have been developed over the years include observation, content analysis, interviews, surveys and documentations (Brians, Willnat, Manheim, and Rich, 2011). Surveys involve the collection of data using questionnaire or interview methods from a representative sample which is drawn from a population of study in a consistent manner. Survey gives quantitative or numeric information that can be tested statistically. On the other hand, interviews are largely open-ended conversation with the aim of collecting insightful, nuanced and comprehensive information that may not be obtained through other techniques. Observations involve watching and recording of bahaviours, interactions or occurrence in a natural setting. With the use of observations, real-time and context–specific data can be obtained to provide an in-depth understanding of the research topic. However, documentary analysis is the process of collecting relevant information from documents such as reports, articles or archival materials. While such information can be used as stand-alone information in desk research, they are mostly used to supplement primary data sources in survey research.

## Triangulation

Campbell and Fiske are credited in the literature as the first to apply triangulation in research in 1959 (Mercedes & Valencia, 2022). The term triangulation originated from geometry, navigation and measurement (Vogl, Schmidt & Zartier, 2019). As a term, in generic sense, triangulation denotes the adoption of two or more methods to study the same subject of interest. Denzin (2017) defined triangulation as the combination of two or more theories, sources of data, research methods in the study of a singular phenomenon. Drawing similar concern, Cownah (1993) conceptualized triangulation as the combination of multiple methods in studying the same object or events to better address the phenomenon researched. For Morse (1991), triangulation is the use of at least two methods, often qualitative and quantitative, to guide the same research problem. Similarly, Abbadia (2023) defined triangulation as the process of examining a research topic or phenomenon from several angles, data sources or methods.

Discernibly, triangulation is one form of strategy in research activity which encapsulates a combination of methods, varieties of data collection instruments, sources of data or perspectives, researchers and theories as well as methodologies essentially intended to ensure the credibility and validity of results of a study. To achieve the goal of validity of research finding, triangulation sometimes involved the use of mixed methods. Nonetheless, triangulation is not the same as mixed methods. While mixed methods generally entails a combination of both qualitative and quantitative research approaches to provide answers to research questions, triangulation is the description of how researchers adopt all the different approaches in research to obtain the desired information as well as critically analyze findings thus establishing validity and credibility (Bans-Akutey & Tiimub, 2021).

## Types of Triangulation

In the literature on research methods, scholars have identified different types of triangulation (Denzin, 1978; Mitchell, 1986; Burns & Grove, 1993; Banik; 1993; Kimchi, Polivka & Hungler, 1995; Begley, 1996; Hussein, 2009). Some of the most notable types are discussed in the succeeding paragraphs:

**Methodological Triangulation:** It is the use of two or more research methods in terms of design or data collection for the study of same phenomenon under investigation. Methodological triangulation is of two types; within and between types of methodological triangulation. Between methods triangulation is cross method triangulation. It involves the use of combination of both qualitative and quantitative methods in studying a particular phenomenon. This type of triangulation is utilized for the purpose of achieving convergent validity and testing the degree of external validity.

On the other hand, within method triangulation involves cross-checking for internal consistency. It depicts complementary methods within a single paradigm used in data collection and analysis. It occurs when a researcher utilizes multiple methods within qualitative or quantitative paradigms towards increasing internal credibility of the research findings. The within type of methodological triangulation involves the use of either two or more quantitative measurements or two or more qualitative approaches such as open interview and observation to collect data on the same phenomenon. The data collected using various methods within any approach are coded and analyzed reportedly and subsequently compared as a way of validating the findings.

**Data triangulation:** This type of triangulation which is also known as data sources triangulation is one in which a researcher or investigator makes use of multiple sources of data on the same study for purpose of validation or maximum theoretical advantage. For example, a researcher studying a particular phenomenon can combine three kinds and types

of data. He/she can source data or observe random samples of individuals, small groups in natural field and an entire organization community or society. Also, a combination of time, space and person can be used in sourcing data for a single event.

**Scale triangulation:** It involves the use of multiple scales in the assessment of a particular phenomenon. This type of triangulation compares validity of the scales used. It is particularly vital in quantitative research as it offers a way for researchers to check their results.

**External validity triangulation:** It involves the comparison of diverse data sets, results or research methods about a given subject under study. By broadening a sample group, observational unit and covering more variables, a researcher's study can be strengthened and more external validity reduces potential bias from research.

**Internal Validity Triangulation:** This refers to the process of comparing variety of data sources or results with aim to find inconsistencies or differences that indicate weaknesses in the validity of the research. Where weakness is unearthed, this triangulation enables the pinpointing of these problems so that the study can be strengthened.

**Spatial or environmental triangulation:** This denotes the collection of data on the same phenomenon in different settings or sites. In spatial triangulation data are obtained in multiple sites and tests of consistency are analyzed by crossing the sites.

**Temporal triangulation***:* It is the collection of data on a given subject under investigation at different points overtime. In this type of triangulation, time is the critical elements. Temporal triangulation is not longitudinal research. This is because the purpose of the latter is to record changes overtime while the purpose of the former, that is, temporal triangulation is to validate the congruence of the same subject through different points overtime.

**Proximity Triangulation:** This is a qualitative research technique, in which the researchers study related phenomena close in time to each other. By so doing the researchers compare related issues throughout a specific period in one setting without having to move from one source to another. This type of triangulation attenuates the occurrence of bias of researcher in the study.

**Theoretical Triangulation:** This type of triangulation refers to assessment of the explanatory power and usefulness of competing theories, or competing hypotheses on the same phenomenon. To achieve the goal of this type of triangulation, data collection approach is used to measure specific concepts and variables from each theory. The operationalization of theoretical triangulation involves list of two opposing rival theories. Use of rival theories in the same body of data allows the combination of multiple perspectives and interpretive minds. This presupposes the presence of efficient criticisms more in tandem with scientific methods. Theoretical triangulation is intended to provide wider and more insightful perspectives on the subject area of study.

**Person triangulation:** It involves the collection of data from at least two of the three levels of person: individuals, couples, families, groups, collectives, communities, organizations or societies. In this context, researchers can obtain data from each of the three levels of persons. In the application of this type of triangulation, data derived from the various levels of individual are used to validate data than other sources or a single source.

**Triangulation of Investigators:** As the name suggests, this type of triangulation involves the use of more than two trained researchers or observers. According to Denzin (1989) researcher triangulation occurs when two or more skilled researchers or observers examined the same data rather than single one in the conduct of investigation or observation in a study.

This presupposes that researcher triangulation involves the use of multiple trained researchers with different background and skills to explore the same phenomenon.

The investigators could be used at various stages in the same study for confirmatory purposes. They could also be deployed at the same stage in the same study have different experiences and disciplinary bias to conduct observations. They may not play equally prominent roles in the process. Multiple observers can be used to observe the same events from different locations. The use of multiple investigators helps to attenuate the personal bias that come from individual Significantly, multiple observers may not agree on what they are observing as the individual observer has peculiar interaction experiences with the object of the study.

**Triangulation analysis:** This refers to the use of two or more approaches in the analysis of the same data group for the purpose of validation. It is applied by comparing data analysis results using different statistical tests or different techniques of qualitative analysis to evaluate similar results available.

**Multiple Triangulation:** It refers to the use of the multiple type of triangulation in the analysis of a single phenomenon. Multiple-triangulation entails adoption of triangulation within methods and researcher triangulation in a study or adoption of triangulation within methods and among methods in a study. Its purpose is to enhance deeper understanding and satisfactory sense of the phenomenon being studied. In synthesis it is the application of two or more types of triangulation in a study.

Based on the conceptual trip on the various techniques of triangulation discussed above, it is apparent that triangulation can be helpful in increasing the validity, reliability and robustness of research outcomes. Each of the various techniques of triangulation has their strengths and shortcomings. Thus, researchers need to ensure that they apply the techniques that are suitable for the research objective, hypothesis or question.

**Steps on How to Conduct Triangulation**

In the conduct of triangulation in social research, Abbadia (2023) identified the following steps:

**Definition of research objective:** To fruitfully use triangulation in social research, having unambiguous objectives and questions are essential parts. The research objectives and questions should determine the scope of the triangulation approach.

**Selection of data collection methods:** To achieve the purpose of the use of triangulation, it is imperative to choose the data collection methods that are in sync with the objectives and capable of providing access to complementary data. At this stage, the researcher should weigh the appeals and flaws of each of the methods of data collection.

**Collection of data:** This stage involves the deployment or employment of the chosen data collection methods and techniques to extract information from variety of sources or perspectives. In the use of the chosen data collection methods and techniques to gather data, the researcher needs to ensure that the procedures are consistent, reliable and ethical. Instructively, there are different data collection methods and techniques for triangulation. Some of the common data collection methods used for triangulation include; surveys, interviews, observations and documentation. Details on these methods have been discussed in the earlier part of this seminar paper.

**Organizing and analyzing the data:** Data collected from multiple sources should be organized and analyzed using appropriate techniques. Some of the techniques which can be applied in organizing and analyzing data collected include comparative analysis, integration of findings and cross-validation. Comparative analysis denotes the examination of the

similarities and differences of several data sources or methods of analysis with the aim of identifying trends, patterns or discordance. Integration of findings involves the compilation of data from variety of sources or methodologies and mainstreaming them into a single dataset that can be analyzed. Cross-validation is the process of comparing results from different data sources or techniques to assess the consistency and dependability of findings. Significantly, application of the various data analysis techniques is intended to identify patterns and ensure dependability.

**Interpretation of findings:** This involves comparing and contrasting the results from multiple data sources or methods and techniques to interpret the findings. It entails the examination of concordance or discordance to draw meaningful conclusion.

**Reflection on limitations:** The use of triangulation is associated with limitations such as bias or resource paucity. It is imperative to acknowledge and address such limitations as well as reflect on their possible implications on the research findings.

**Communication of results:** Triangulated findings are to be communicated unambiguously by highlighting the contributions, challenges and implications of the research. This means the results should be presented comprehensively, clearly while acknowledging the sources of data and the analytical process utilized.

**Empirical Review**

The use of triangulation in social research has generated debates amongst scholars. Olsen (2004) noted that triangulation is suitable for the enhancement of broad and in-depth understanding of social issue being studied. Drawing similar concern, Molina (2023) contended that triangulation can expand the research process to contribute to deeper and broader comprehension of the phenomenon given that it adds rigour, amplitude, complexity, richness and depth to any research. Also, Patton (1999 cited in Rocha, 2023) claimed that qualitative and quantitative data can be combined productively when these expound complementary perspectives of the same phenomenon. Some other scholars such as Webb, Campbell, Schwartz & Sechrest (1966); Smith & Klene (1986); Denzin (1978); Gloafshan (2003) have contended that triangulation is employed to enhance accuracy or the validity measures of a study. Similarly, Creswell & Miller (2000) noted that triangulation involved the use of multiple methods essentially qualitative and quantitative methods in the study of the same social problem for the purpose of increasing validity and reliability of a study.

Symeondou and Phtiaka (2009) use triangulation to research the perceptions and practices of teachers regarding inclusive education. The study involved two researchers with different backgrounds and expertise. One of the researchers was with disability and the other one without a disability. The purpose of the study was to provide explanation and understanding on the drivers and inhibitions of consumers using different theoretical models such as the theory of planned behavior, the health belief model and the value-belief-norm theory. Peter-Scheffer et al (2011) applied method triangulation in researching the effectiveness of a school-based intervention for children with autism. They integrated quantitative and qualitative methods such as standardized tests, questionnaires, interviews and observation. Boulianne (2015) utilized data triangulation to study the impact of social media on political participation. In generating data for the study, online survey, interviews and content analysis of social media posts were used in the examination of the attitudes, behaviours and opinions of the participants.

As seminal as these earlier studies are, their focus is not on the challenges and opportunities of the use of triangulation in social research phenomenon such as the limiting factors on the performance of the NSCDC in anti-vandalism campaign which is the thrust of this article.

## Data and Methods

To illustrate and elaborate the challenges and opportunities associated with the use of triangulation in social research, this study examines the differences in the perception of the limiting factors on the performance of the NSCDC in anti-vandalism campaign in Edo State. This study focuses on the issue of combining qualitative and quantitative methods of research in the examination or assessment of the social phenomenon. The universe of this study was the Edo State Command of the NSCDC. The personnel strength of the Command as the time of this research, April 2024, is one thousand four hundred and two (1,402). The personnel population comprises; Superintendent Cadre, 791; Inspectorate cadre, 89; and Corps Assistant Cadre, 522 (NSCDC Edo State Command Nominal Payroll, 2024).

To serve as searchlight for the study, a proposition was formulated thus. There is no significant difference in the perception of the NSCDC personnel in various cadres that lack of cooperation from residents of local communities hosting critical national assets is a dominant factor limiting its anti-vandalism campaign in Edo State.

Focus Group Discussion (FGD) and personal in-depth interviews as qualitative research method instruments and survey questionnaire as quantitative research method instrument of data collection were employed. A total of 260 respondents were drawn to constitute the sample size. The sample size was drawn from the universe of 1,402 men and officers of the NSCDC in the state. Out of the 260 respondents, 40 personnel were used for the FGD, 20 for the personal in-depth interviews, and 200 for the survey questionnaire. The respondents for the FGD and the personal in-depth interview were purposively selected while those of the survey questionnaire were randomly selected. The respondents for the personal in-depth interviews were personnel of the NSCDC in the Superintendent Cadre, those of the FGD were in the Inspectorate Cadre while those for the survey questionnaire were of the Corps Assistant Cadre. The respondents drawn in each category were excluded in the other categories. This approximates person triangulation at three levels in the NSCDC.

The administration of the three research instruments involved these researchers and three trained field assistants, thus depicting triangulation of investigators. The information elicited from the FDG and the personal in-depth interview were presented and analyzed using thematic approach while the responses derived through the survey questionnaire were tested quantitatively. This approximates triangulation analysis.

Results from the personal interview and FGD point to the same direction. They indicate preponderant view that lack of cooperation from the residents of the local communities hosting critical public and national assets and infrastructure limits the performance of the NSCDC in anti-vandalism campaign. To illustrate the preponderant view of the personal in-depth interview and FGD, some summaries and excerpts are presented as follows: An interviewee noted that “some unscrupulous elements in the host communities connive with vandals to steal and destroy public facilities such as electric cables. This limits the effectiveness of the NSCDC’s anti-vandalism campaign” Similarly, another interviewee stated that the efforts of the operatives of the NSCDC to combat the vandalism of public property are frustrated by limited cooperation from residents of many host communities of such critical assets. Also an FGD noted “how can we apprehend suspected vandals who attack and steal public property when the residents of most of the host communities are not ready to volunteer intelligence that can lead to such arrest?” Another discussant held that NSCDC’s campaign teams are unable to provide satisfactory response to crack and clampdown on the criminal activities of vandals because some residents of the host communities of these critical assets and public utilities are aiding and abetting vandals.”

On the other hand, the dominant view of the respondents of the survey questionnaire point in different direction. It depicts a preponderant view that conspiracy by state actors with vandals limits the performance of the NSCDC in anti-vandalism campaign in Nigeria.

Survey results of the Perception of Corps Assistant Cadre to the Research Proposition

| Response format | Frequency | Percentage |
|---|---|---|
| Yes | 49 | 24.5 |
| No | 151 | 75.5 |
| Total | 200 | 100 |

Source: Field study, April 2024

**Discussion of Challenges Inherent in Using Triangulation**

In the use of triangulation in researching the factors limiting the performance of the NSCDC ant-vandalism campaign in Edo State various challenges were encountered. Some of the most notable challenges, which border on the methodological and practical implementation of triangulation of multiple research instruments of data collection, are discussed as follows.

**Increased complexity and conflict in research process:** The application of triangulation in researching same phenomenon can be complex and challenging. This is because it requires combining and synthesizing sourcing data through different instruments, which sometimes generate conflicting findings. In the use of triangulation in social research, a researcher can face the challenge of having different samples and the different samples produce two data sets. In our empirical case study, as noted the survey questionnaire produced information different from the information produced through the personal in-depth interview and FGD. Such combination can become confusing as both methods are designed to be use for different purposes.

While survey questionnaires as quantitative methods are designed to be used for the purpose of generalization, interview schedules as qualitative method are designed to be used for the purpose of in-depth description. The collection, weighing and analysis of cases from both methods can be challenging to a social researcher. Thus, it can be asserted that the use of triangulation is so complicated that it requires careful planning by the researchers to navigate and manage the integration of multiple methods of data sources, data collection, analysis and interpretation. Sometimes, a further research could be recommended.

Additionally, the complexity of the use of triangulation poses a threat to the confirmatory purpose of research result. For example, based on the result of our empirical case study some questions can be posed in relation to the challenges of triangulation for confirmatory purpose. Given the opposite direction of the results of the personal in-depth interview and FGD to the survey questionnaire, one can ask which of the results should be considered valid? Why do the personnel of the NSCDC have different viewpoints on the factor limiting the performance of the agency in its anti-vandalism campaign? At this juncture, one would assert that these findings are inconclusive or contested and challenged as alternative explanations or interpretations.

Furthermore, based on our case empirical case, the interpretation of triangulation on the basis of the strengths and weaknesses of different methods and values of complementary information, pertinent questions can be raised about how complementary and valid can be data obtained from a range of informants. Can complete information about a phenomenon ever be obtained? Should sources of data be assessed or premised on the suitability for purpose or on the premises of completeness? How do researchers understand which data source provides the most desirable kind of complementary information? Put in other words, how can the biases or peculiar characteristics of a particular source of data be identified? Given these critical questions, it is instructive to note that the adoption of triangulation to produce complementary data and using it to serve validation are not compatible.

**Increased subjectivity:** The use of triangulation in social research can be subjective and interpretive since the researchers are required to exercise their own volition about the

credibility and relevance of different sources or methods. Based on the results or observation in the course of our empirical study, it is instructive to note that while triangulation involves a combination of diverse techniques or data sources, the biases and perspectives of social researcher could still influence their perceptions, analyses and interpretation of data. This is because of the need to combine and synthesize findings from multiple sources which could involve subjective decisions and possibly introduce researcher bias.

**Resource-intensive:** The use of triangulation can be resource-intensive. This is so as multiple instruments are required for data collection from different samples. As a multiple methods of study, the application of triangulation in the study compared to a single study involves the investment and expenditure of much more enormous resources in the forms of finance, material, energy and time, which are often limited in supply. As a multi-method study, the use of triangulation consumes much more time and energies. As a combination of multiple sources of data or instruments of data collection large or different samples of respondents are required. In our empirical study, rather than a single sample of respondents, different samples were drawn for the various instruments of data collection. As stated earlier, 20 respondents constituted the sample for the personal in-depth interview, 40 for the FGD and 200 for the survey questionnaire. Also, each of these instruments in terms of design and administration consumed quantum of time and efforts more than the use of a single instrument would have taken.

**Limitation to certain research purposes:** The use of triangulation is a limitation to certain research purpose such as theory building. As a young and budding researcher desiring to make unique contribution to theory building, the use of triangulation towards reaping the strengths and shortcomings of both quantitative and qualitative methods can be very challenging. This is particularly so for a social researcher who is tied to time for completion and constrained by limited financial resources.

Another practical challenge a researcher may encounter in the use of triangulation can stem from the differences in the philosophical positions between academic mentors and mentees which may generate conflict in the empirical study. For example, the mentor may have preference for qualitative approach even when the study necessitates the use of both qualitative and quantitative research methods. Thus, it becomes a great challenge for the mentee to get the mentor to switch his/her philosophical standpoint to that of the mentee.

**Opportunities Inherent in the Uses of Triangulation**

Despite the foregoing critical methodological and practical challenges researchers can encounter towards the use of triangulation in social research, there are multiple opportunities and benefits associated with its uses. It particularly offers valuable opportunities in social research in the following situations as outlined and discussed in the succeeding paragraphs.

**Opportunity for mitigating bias and confirmation of research findings:** By its utilization of various sources of data, methods or perspectives, the use of triangulation provides opportunity for mitigating biases, enhancing validation and strengthening of the reliability of research findings. By the use of multiple sources, triangulation helps to lower research biases in sampling, procedural bias and researcher's bias. As investigators deploy multiple methods, qualitative and quantitative methods, and were fortunate to secure some findings from the personal in-depth interview and FGD as research instruments methods that are pointing in same direction, the results are then confirmed. Confirmation of results is indicative of the accuracy of work done. Instructively, the confirmation of result is not suggestive that the data sourced cannot be questioned. As Bans-Akutey and Tiimub (2021) noted it is important to often raise questions about data collected in order to advance research and aid understanding.

Apart from providing opportunity for validating qualitative research instruments, the use of triangulation for confirmatory purpose also offers opportunity to confirm if the instruments are appropriate for measuring the limiting factors on the performance of the NSCDC in its anti-vandalism operations. Where there are conflicting findings, during triangulation, the researcher can readily confirm and explain the reason for the inconsistent and conflicting findings by isolating, identifying error in sourced collected and possibly cleaning them. This does not suggest that a researcher can out of their own volition remove some data for a study as that would be an unethical act and could have impact on the research result. The removal of error in sourced data can be made easier because of the involvement of multiple field assistants and interviewees.

Furthermore, the use of triangulation can particularly create useful opportunity for enhancing the trustworthiness**,** validity and reliability of research findings on complex, controversial or sensitive subject in our empirical case study as it involves the use of different persons to collect data. With the use of different researchers with varying backgrounds, expertise is brought to the collection of data. By this process, the potential biases and inaccuracies can be addressed. In sensitive subjects such as anti-vandalism campaign by the NSCDC as a security outfit, the use of multiple investigators can help in ensuring accuracy in the collection of data. Also, the use of multiple investigators can be helpful in the removal of inconsistencies or inaccuracies in the data that single researcher could have missed out. This process helps to ensure consistency and reliability in data collection.

**Exploring and gaining in-depth understanding of complex phenomena:** Social phenomena are complex. Thus, it may be difficult to gain complete understanding of such phenomenon by a single approach or data set. The use of triangulation provides a greater opportunity for exploration and comprehensive understanding of complicated objects that are marginally explored or unexplored. By the use of triangulation as a research approach, which combines various methods or sources of data, opportunity is created for addressing the inherent weaknesses associated with the use of a single research approach by the appeals or merits of another method or technique. As an illustration, in a study where a combination of qualitative methods is employed side-by-side as in our empirical case study, the researcher can verify findings from qualitative data, probe relationship and represent findings statistically. At the same time, the researcher is able to appreciate the context of the findings and comprehend the issues that arise from the results of the quantitative data.

A combination of qualitative and quantitative research methods as in this case are mutually contributory, complementary and reinforcing in the researching of marginally explored social research problem such as the limiting factors on the performance of NSCDC in anti-vandalism campaign. The results of our empirical investigation indicated divergent views on the preponderant factors limiting the performance of the outfit. However, the result did not explain why the divergence exists and no extant literature on the different viewpoints. These different views help to deepen understanding of the phenomenon.

Apart from marginally exploring problem, the use of triangulation for completeness of purposes creates an important opportunity for the investigation of complex social research. Anti-vandalism campaign as a response to security challenge is a complex social research phenomenon in Nigeria. The increasing cases of vandalism of critical public and national assets have remained issue of grave concern due to the hemorrhagic consequences, which result in huge security deployment for surveillance by the trustees of the Nigerian state. Despite the huge deployment of Nigerian security agencies such as the NSCDC to mount surveillance over these assets, vandals still operate seemingly with impunity. Only a whimper has come from the security agencies hence the Federal Government has contracted the surveillance to non-state security actor such as the award of pipeline surveillance to the Tantita Security Service Nigeria Limited owned by an ex-agitator, Government Ekpemupolo

aka Tompolo. The worth of the pipeline surveillance contract is $48 billion (Izuaka, 2022; Obiezu, 2022; *The Sun*, February 27, 2023; Odeniyi, 2023A; Odeniyi, 2023B; Nnodim, 2023). While the engagement of Tantita Security Service Nigeria Limited has reportedly recorded some successes, it has also resulted in apprehension because as the former leader of a militant group (Movement for the Emancipation of the Niger Delta, MEND), there are skepticisms about how easy it is for such security proprietor to substitute or switch loyalty (*Vanguard* May 13, 2023).

By the integration of diverse approaches or dataset, triangulation helps researchers to gain more comprehensive analysis, understanding and satisfactory explanation of a given phenomenon understudy. As an approach involving the use of diverse or a range of approaches, theories or sources of data, triangulation offers opportunity for researchers to unearth the various aspects, dimensions or perspectives of the phenomenon under study. This comprehensive approach offers opportunity for researchers in presenting a more complete and nuanced understanding and analysis of sourced data or research findings on a phenomenon being studied by capturing its multiple dimensions and aspects. Also, the involvement of multiple researchers in the process of data analysis and to report their findings transparently may result in the provision of detailed description of the analysis process and the roles of each researcher involved.

In synthesis, according to Erzberger & Kelle (2003:46) the use of different methods to investigate a certain domain of social reality can be compared with the examination of a physical object from two different viewpoints or angles. Both viewpoints provide different pictures of the object that might not be useful to validate each other but that might yield a fuller and more complete picture of the phenomenon concerned if brought together. They further noted that "empirical research result obtained with different methods are like the pieces of a jigsaw puzzle that provide a full image of certain object if put together in the correct way."

**Generalizability:** By triangulation of participants at various levels as is the case in our empirical study where data were sourced from the Superintendent, Inspectorate and Assistant Defence Corps cadres of the NSCDC, the use of triangulation can boost the generalizability of research findings. This is so because by indicating that such findings are applicable and relevant to different levels of the population of study. Also, the use of triangulation in social research provides researchers the opportunity to build a comparative matrix. This is because the design allows researchers to compare and contrast data obtained from different databases or research instruments.

## Conclusion

The use of triangulation as illustrated by our empirical sampler engenders a mixed bag of both methodological and practical challenges as well as perceptible opportunities. The notable challenges associated with the application of triangulation in social research especially for budding scholars such as doctoral students are methodological and practical. On the other hand, the use of triangulation in researching social issues and finding solutions provides opportunities for exploring and gaining fuller understanding of such phenomenon as it views the subject matter from various viewpoints. Additionally, it can be useful in the validation of data collection instruments, lowering subjectivity of researchers, and addressing the inherent weaknesses and limitations associated with the use of a single method or approach to researching social phenomena.

Thus, to maximize the effectiveness and efficiency of the benefits of the use of triangulation and to overcome its methodological and practical challenges and limitations in researching social phenomena, the following suggestions are imperative. Researchers need to plan their research ahead and be transparent about the objective, process and outcomes, as well as be reflective about the strengths and shortcomings of various instruments of data

collection. Additionally, they need to be open, ready and willing to work in concert with other researchers. Furthermore, they should learn to engage in dialogue about the implications of their findings and seek expert opinions and feedbacks from different perspectives.

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