



MATHEMATICS EDUCATORS PERCEPTION ON WAYS OF RESOLVING HUMAN DEVELOPMENT ISSUES IN NIGERIA THROUGH MATHEMATICS

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ABSTRACT

This study investigated ways of resolving human development issues in Nigeria through Mathematics. The study adopted a descriptive survey research design. The population of the study consisted of 724 Mathematics educators from the Education Zones in Cross River State. A sample of 258 respondents was drawn using a convenient non-probability sampling technique by applying Yamane's formula. Three research questions were raised to guide the study. A structured questionnaire of 15 items was used to collect data on ways of resolving human development issues in Nigeria through Mathematics. The instrument was validated by three experts; two of them were Mathematics experts while the other was from Tests and Measurement unit of the department of Educational Foundations, all in University of Calabar. The reliability of the instrument was calculated using Cronbach Alpha. The questionnaire had a reliability coefficient 77 data collected were analyzed using descriptive statistics of mean and standard deviation. Among the findings were that Mathematics can be applied in resolving human development issues in Nigeria through helping an individual to forecast for the future, carry out research on resolving human development issues and to take decision. It was recommended among others that: there should be effective and functional mathematics education at all levels in order to transform skills realized for mathematics to solve the nation's security challenges; Since mathematics enhances the level of human reasoning and further develop the mind, technical and generic courses undertaken by staff in any industry should continuously incorporate some level of mathematics in their training curricula. This will further develop the minds of our present and future leaders for better decision making and be more scientific in general management and public administration; Mathematics educators should be involved in all government programmes for resolving human development issues.

KEYWORDS: Human Development issues, Effects of Terrorist Attacks, Government's Responses, Mathematics, Nigeria.

INTRODUCTION

Nigeria has been grappling with security challenges for over decades, with the emergence of Boko Haram terror group, banditry activities and incessant kidnap for ransom.

The Nigeria security challenges began from 2009 with the emergence of Boko Haram in the country's northeast who later spread their terror activities down to north central region. Besides Boko Haram that has been misusing religion

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subversive activities, armed gangs, kidnappers and separatist groups have exacerbated the security situation in the western African country like Nigeria with over 200 million people (Sharhabilu, Abba & Sumayya, 2022).

The conflict between Cattle herders and farmers, the presence of Islamic Movement in Nigeria (IMN) Known as Shi'ite in the north central Nigeria, the Niger Delta Militant group, the Indigenous People of Biafra (IPOB) and the Eastern Security Network (ESN) in the Southern region all disrupt the peace in one of the Africa most populous country. Despite several operations to prevent terror group attacks on civilians, kidnapping for ransom and attacks on schools and other essential government facilities in the country continues unabated, the Nigerian government is yet to find a lasting solution to the country's security dilemma. These terror groups tend to recruits illiterate youth in particular, offering poor youth high wage in exchange for joining the terror group.

In a submission to the United States Congress, on the aftermath of the attack of September 11, 2001 at the World Trade Centre towers, Farrar (2002) cited in Sharhabilu, Abba and Sumayya (2022), emphasized the need for critical skills in mathematics, engineering Information and Communication Technology to enable the Federal Bureau of Investigation (FBI) to exploit digital evidence and the technologies that collect, convey or process digital information about the nation's security. To complement, the above emphasis, Schatz (2014) further pointed that the United State National Security Agency hired approximately 50 highly qualified mathematicians yearly to enhance its operational work. Mathematics is therefore seen as the language of science and technology (Ugbebor, 2009). Ibidapo-Obe (2011) also stated that mathematics knowledge is fundamental in addressing the critical issues of economic transformation and globalization. Otunu-Ogbisi and Ukpebor, (2009), see mathematics as an effective tool for solving crime and security problems. It is on the basis of this that the paper examines the various mathematics skills and their effect on the National Security System.

In the National Transformation agenda, no progress can be made without adequate use of mathematics. It is the queen of sciences. It should be used in the National Transformation Agenda as an essential tool in many fields, including natural science, engineering and technology, medicine and social science. Mathematics is an important subject, the knowledge of which enhances a person's reasoning, and problem-solving skills. Mathematics as a tool, its knowledge and skills are the bedrock of all societal transformation and transfer of ideas into reality (Abubakar & Afe buame 2011). Otunu-Ogbisi and Ukpebor (2010) defined Mathematics as an indispensable tool for the transformation of technological development to reality, since it communicates the idea of growth, expansion and improvement in goods and services emanating from practical applications of science to reduce poverty, crime and security problems. Solvers Esangbedo (2008) cited in Sharhabilu, Abba and Sumayya (2022) stressed that there can be no proper development without Mathematics. Otherwise, it will become development without growth.

According to Zakariya and Barva (2013), the applications of mathematical skills in a nation's security can be highlighted as follows:

1) Wavelet Transformation (Signal Intelligence)

This is a new technique which is very important in all types of signal transmission and it is based on transmission of a series of numbers. Wavelet analysis is an exciting new method which applies principles of mathematics and physics in solving difficult civil and security problems. Some applications of wavelets are powerful statistical tool which can be used for a wide range of applications namely; Signal processing, Data compression, Wave propagation, Image processing, Pattern recognition, Detection of aircraft and submarines, Fingerprint for detecting the properties of quick variation of values, In internet traffic description for designing the services size, Industrial supervision of gear-wheel, Computer graphics and multi-fractal analysis.

Wavelets process complex information at different positions and scales and reconstructs

them with high precision (Zakariya & Barwa, 2013).

2) Financial security

According to Abubakar, Charles-Ogan and Albert (2014), financial security involves financial instrument which is a tradable asset of any kind, either cash, evidence of an ownership interest in an entity or a contractual right to receive or deliver cash or any other financial instrument. Mathematics skills such as counting and budgeting are needed for personal financial security. Also skills such as identification of numbers and correct valuation of money are needed for easy assessing of ATM cards and detection of fraud respectively. In the banks, savings, assets and liabilities, and bonds are valued using numbers. Loans, overdrafts and Commission on Transaction (COT) are given out using simple or compound interest rates. Also mathematical skills consistency is required when for example a share price is taken and stochastic calculus is used to obtain the corresponding value of derivatives of the stock.

3) Economic security

Economic security is measured using economic indices to measure the economic wellbeing of a nation. Mathematical skills are utilized to measure these indices. One primary indicator used to gauge the economic health of a country is the Gross Domestic Product (GDP). A negative GDP is a sign of recession which signifies unhealthiness while a positive GDP implies healthiness. Other economic indicators that requires mathematics skills are: Human Capital Index (HCT), Education Index (EI), Mean Years of Schooling Index (MYSI), Expected Years of School Index (EYSI), Income Index (II) and Consumer Price index which is used to measure reflection ultimately, the aspects of ratio, percentages, ordinal counting and algebra of numbers are essential mathematics to be used to be able to interpret the economy of any nation.

4) Cryptography (Data security)

This makes use of Number Theory (Modular Arithmetic) and concept of Prime Number, and is the science of using mathematics to encrypt and decrypt data. Data security is a chief security concern when it comes to transmission of computer passwords, electronic e-commerce,

private conversations and Automatic Teller Machine (ATM) cards. Cryptography is the practice of hiding information, converting some secret information to a non-readable text. It enables one to store sensitive information or transmit it across insecure networks (like the internet) so that it cannot be read by anyone except the right person(s). Applications of cryptography include military information and intelligence, electronic commerce, bank and payments and electronic building access. It is one of the cornerstones of internet security (Zakariyya & Barwa, 2013).

Several empirical researches has been done as regards applications of Mathematics to development of a nation. Ukpata and Agha (2012) conducted a study to examine whether the study of mathematics as a subject or course has any significant relationship with Nigerian National Development. Also, to ascertain if organizations whose workforce are sound mathematically are more likely to achieve higher productivity than those whose workforce are defective, mathematically. The methodology used to elicit data for the analysis was a simple random sampling technique by which a total of 100 respondents were selected from three faculties of the Kogi State University, including the bursary department. The sample size comprised of both students, academic and non-academic staff of the university. The method was considered adequate for the study in view of the homogenous nature of the population surveyed. The study revealed that "mathematics" as a field of study, was the only key to technological breakthrough in any given society. And no society could make meaningful progress in science and technology without embracing the concept, logic and philosophy of mathematics which is the tap root to all scientific thinking minds.

Alio and Anaeché (2020) conducted a study to investigate the various ways of application of Mathematics in industrial development and wealth creation in Nigeria. It adopted a descriptive survey research design. The population of the study consisted of 1308 personnel from Enugu state Ministry of Commerce and Industry and a cross section of

53 Mathematics educators. A sample of two hundred respondents was drawn using a convenient non probability sampling technique. Three research questions were raised and three research hypotheses were formulated to guide the study. A structured questionnaire of 15 items was used to collect data on the ways of application of Mathematics in industrial development and wealth creation in Nigeria. The instrument was validated by three experts; two of them were Mathematics educators while the other was from the department of Measurement and Evaluation, all in Enugu State University of Science and Technology. The reliability of the instrument was calculated using Cronbach alpha. The questionnaire had a reliability coefficient of 0.85. The data collected were analyzed using mean score on a four-point scale. The hypotheses were tested at a level of significance of 0.05 using t-test statistic. Among the findings were that Mathematics can be applied in industrial development and wealth creation in Nigeria through helping an individual to forecast for the future, carry out research on industrial prospects and to take decision.

Soumen (2018) carried out a study to describe Mathematical modeling as indispensable tool for sustainable development. Sustainable development is to balance our economic, environmental and social needs allowing prosperity for now and future generations. Mathematical Science plays as tackle the challenges facing our planet. Mathematical modeling plays useful roles towards sustainable development in arriving the understanding, prediction and control of development process. Mathematical modeling can be a powerful tool for understanding and observed phenomena which cannot be understood by verbal reasoning alone. It was concluded that for sustainable development, it is necessary to build mathematical model.

Rani and Sowjanya (2018) conducted a study on importance of mathematics in sustainable society. This paper focus on promotion of mathematical research encourages teachers at all levels of education to raise awareness of the key issues and informing the general public of the essential role that mathematics plays. Kalu,

Ugwa and Agwu (2012) conducted a study on mathematical modeling as a tool for sustainable development in Nigeria. Here looked at the advantage of mathematical modeling over other types of modeling and classified math models.

Singh (2014) conducted a study on mathematical models in sustainable development. Here exponential and logistic equation models as used in studies of growth of population, water quality, fishery and economy. Sustainable development requires designing mathematical models. Nampally and Nagabhushan (2018) conducted the study on the role of mathematics in sustainable development. Here reflects social implication of mathematics education for sustainable scientific and technological development.

The human cost of terrorism has been felt in virtually every corner of the globe. Terrorism clearly has a very real and direct impact on human rights, with devastating consequences for the enjoyment of the right to life, liberty and physical integrity of victims. Terrorism disrupts livelihoods, increases violence and fear, affects production in all sectors of economy, destroys infrastructure and has resulted in bloodshed. In all cases of terrorist attacks, it has disrupted normal life, stalled production in the economy and international effort to provide peace and security. In addition to these individual costs, terrorism can destabilize Governments, undermine civil society, jeopardize peace and security, and threaten social and economic development. All of these also have a real impact on the enjoyment of human rights. Security of the individual is a basic human right and the protection of individuals is, accordingly, a fundamental obligation of Government. States therefore have an obligation to ensure the human rights of their nationals and others by taking positive measures to protect them against the threat of terrorist acts and bringing the perpetrators of such acts to justice.

Terrorism is commonly understood to refer to acts of violence that target civilians in the pursuit of political or ideological aims. Terrorism aims at the very destruction of human rights, democracy and the rule of law. It attacks the values that lie at the heart of the Charter of the United Nations and

other international instruments: respect for human rights; the rule of law; rules governing armed conflict and the protection of civilians; tolerance among peoples and nations; and the peaceful resolution of conflict. Terrorism has a direct impact on the enjoyment of a number of human rights, in particular the rights to life, liberty and physical integrity. Terrorist acts can destabilize Governments, undermine civil society, jeopardize peace and security, threaten social and economic development, and may especially negatively affect certain groups. All of these have a direct impact on the enjoyment of fundamental human rights.

Several studies have shown that Nigeria's insecurity problem in recent times is diverse and multi-dimensional in nature, causes and effects (Eteng, 2016; Hussaini, 2016; Minti, 2016; Sesay and Kayode, 2016). Contemporary security challenges in the country range from threats of kidnapping/attacks on oil installations, armed robbery, cultism and Boko Haram terrorism, to the herders–farmers crisis, proliferation of SALWs, drugs and human trafficking, and threats of secession. Others include the glut in the world oil market, transnational organized crime, cybercrime, money laundering and currency counterfeiting, maritime piracy, particularly in the Gulf of Guinea, slow dispensation of justice and prison congestion.

According to Minti (2016) Nigeria gained international prominence as one of the most terrorized countries in the world with the emergence of Boko Haram. Minti's (2016) study revealed that the scourge of terrorism in the northeastern part of Nigeria has altered the demographic composition of the society by stirring mass exodus of people to areas considered less prone to violence, leading to the proliferation of Internally Displaced Persons (IDPs) camps, with attendant human development challenges. It further revealed that terrorism is capable of bringing the Nigerian economy to its knees through the destruction of critical installations and facilities such as oil pipelines, electricity, schools, police stations, etc. as well as the erosion of inter-communal trust and the destruction of social capital that is vital to peaceful coexistence and the polling of energies

of communities for national development. In addition, the threat of terrorism has negatively impacted enormously on Foreign Direct Investment upon which Nigeria heavily relies.

Another major security challenge currently facing Nigeria and worthy of consideration here is the threat of kidnapping. Between 2004 and 2009, kidnapping of foreign and Nigerian oil workers for ransom, along with bombing of oil installations and attacks on security agencies were frequent and more alarming than Boko Haram today (Alemika, 2015; Minti, 2016). Within that period, kidnapping was only common in the South-South and South-East of the country but has now become a nation-wide phenomenon that knows no barriers in the selection of victims and spread (Eteng, 2016). Alemika's (2015) study revealed that the most likely victims of kidnapping were oil workers, foreigners, Nigerian politicians and relatives, business tycoons, religious leaders, professionals and children of the rich who are often only released after a negotiable ransom has been paid. Available police statistics in a previous study indicated that in 'January 2008–June 2010, more than a thousand and two hundred cases of kidnapping were recorded' (ibid: 21).

More still, in the first quarter (January–March) of 2016 alone, a total of 492 cases of kidnapping were recorded in Nigeria, involving 662 hostages/victims, 38 casualties (covering victims, suspects and sundry), 118 arrested suspects, over 3.6 billion naira ransom demanded and over 212 million naira ransom paid (Eteng, 2016). A few examples of some of the kidnap gangs identified in Eteng's (2016) study include: a confederate of individual kidnap gangs who menace the coastal areas of the Niger Delta and the Gulf of Guinea, often targeting moving vessels; the Ansaru kidnap group which has been described as having some religious/ideological (terrorist) interest; the BUBA kidnap ring which menace the north-west region, a varying grade of Fulani cattle men who presently combine herding with kidnapping, and a 'plethora of amateurish kidnapers that presently dot the entire landscape of Nigeria from North to South and East to West' (Eteng, 2016). A recent wave of kidnapping in the North-Central region of the country, particularly along the Abuja–Kaduna

road has often involved eminent citizens, especially politicians, as victims to the extent that Nigerian lawmakers no longer consider it fashionable to use official number plates on their vehicles because of fear of being kidnapped (Ameh, Baiyewu & Dauda, 2017).

Akinyetun (2017) conducted a study to investigate the impact of terrorism on national security and development in Nigeria. This is on the stance that terrorism has not only undermined national security but has unavoidably hampered meaningful development in Nigeria by violating human rights, displacing residents, discouraging trade and investment; local and foreign, threatening livelihood, and amplifying casualties. The study contends that terrorism is a global phenomenon from which Africa is not immune and Nigeria not insusceptible. The article, which adopted a qualitative and exploratory approach and relied on descriptive analysis of secondary sources, demonstrated that having adequate knowledge of the phenomenon is key in fashioning assuasive measures just as understanding the consequences is instrumental to forging a way out. The research further appraised the causes of terrorism in Nigeria and identified the factors—ethnic and religious identity, exclusionary character of the state, and lack of political will among others, which have fueled protraction of the insidious trend. The study thus advocates for a strong commitment to counter-terrorism strategies, adoption of The Meghalaya Model, Youth Empowerment, Institutional as well as Capacity building as the way forward.

Ameh (2022) carried out a study to examine the acts of terrorism carried out in the North and South of Nigeria and how it has impacted on Nigeria's economic development by adopting documentary method of data collection and depending on qualitative analysis as a framework of contextual analysis of relevant data, and the use of the frustration aggression theory as a theoretical framework of analysis. The paper explored terrorism in Nigeria, mirroring the principal terror actors in the country; economic development in Nigeria; and the impacts of terrorism on Nigeria's economic development. It also by way of recommendation proffered

suggestions that government should intensify to diversify the economy, adopt more non kinetic approach to counterterrorism, secure the porous borders and address the root causes of terrorism so as to enhance sustainable economic development.

Alade, Mba, Aduku and Ameh (2021) carried out a study to examine the impact of terrorism on economic growth and human capital development in Nigeria from 1981 – 2019. The Generalized Method of Moments (GMM) estimator was employed in analyzing the data. A negative and insignificant impact of terrorism on economic growth and human capital development was found. Internal and external conflict also had a negative and insignificant impact on economic growth and human capital development. Government expenditure as well had a negative and insignificant impact on economic growth and human capital development. Domestic investment had a positive and significant impact on economic growth, while its impact on human capital development was positive but insignificant. The researchers, therefore, recommend establishing a bank of security to directly fund security in Nigeria. This can contribute to remedying the terrorism situation. Also, establishing a bank of security can serve as a channel where armed forces and other security personnel who died in service to the nation can be compensated. This will encourage the armed forces in the battle against terrorism.

The empirical literature includes the study by Edeme and Nkalu (2019) who examined the growth and fiscal effects of terrorism in Nigeria. The study employed the simultaneous equation approach. It was found that terrorism is resulting in low economic growth. In Pakistan, Siddique, Liaqat and Ullah (2017) examined the effect of terrorism on domestic investment as well as foreign direct investment. The study covered the 1980 – 2015 sample periods. The autoregressive distributed lag bound testing co-integration approach was employed. The study found a long-run relationship between terrorism and investment. A negative effect of terrorism on both domestic and foreign investments was also found.

Sami and Khattak (2017) examined the long and short-run impact of terrorism on the economic growth of Pakistan during 1980 – 2016. The study employed the Auto Regressive Distributed Lag (ARDL) approach to co-integration. The findings showed that terrorism huddles economic growth. Turkey Altay et al. (2013) examines the relationship between terrorism and economic growth using panel data analysis from 1996 to 2010 to assess the effects of terrorism in the Middle East countries. The result reveals that terror negatively impacted all economic variables, mainly tourism. Gaibulloev and Sandler (2011) examined the adverse effects of domestic and transnational terrorism on income per capita growth for 51 African countries for 1970 – 2007. The study employed the fixed-effects panel estimator. It was found that transnational terrorism had a significant, but modest impact on per capita growth income. It was also found that domestic terrorist events do not affect income per capita growth.

Unfried and Kis-Katos (2020) investigated the heterogeneous impact of conflict on education in sub-Saharan Africa with their Spatial Analysis. By integrating 66 rounds of DHS surveys with details about geo-coded conflict. The study identifies the conditions under which and to what extent armed conflicts endanger children's long-run educational achievement in rural Sub-Saharan Africa. The result reveals that high-intensity conflicts in strong autocracies reduce local educational achievement but are insignificant. However, low-intensity localized conflict doesn't affect education. To poor states, the lack of human resources is often felt seriously. Ebiede (2017) had noted that militancy in the Niger Delta continues to reduce oil production, putting the country's economy in even more jeopardy at a time when oil prices are at an all-time low. Militancy also makes it easier to commit oil theft, which is a widespread crime in the Niger Delta. The unrest in the Niger Delta provides an opportunity for criminal networks in the Gulf of Guinea to prosper. Pirates in the Gulf of Guinea are a major source of concern. Armed organizations from the Niger Delta have a lot of ties to pirate networks in the Gulf of Guinea.

These threats concern both the Nigerian government and the rest of the world.

In all, terrorism impedes development in the following ways as summarized by Ewetan and Urhie (2014): Social dislocation and population displacement, Social tensions and new pattern of settlements which encourages Muslims/Christians or members of an ethnic group moving to Muslim/Christian dominated enclaves, Heightens citizenship question which entrenches hostility between “indigenes” and “settlers”, Dislocation and disruption of family and communal life, General atmosphere of mistrust, fear, anxiety and frenzy, Dehumanization of women, children, and men especially in areas where rape, child abuse and neglect are used as instruments of war, Deepening of hunger and poverty in the polity, Discourages local and foreign investment as it makes investment unattractive to business people, Halts business operations during period of violence and outright closure of many enterprises in the areas or zones where incidence of insecurity is rife and are on daily occurrence, Increases security spending by business organizations and governments, Migration of people from area or region where there is prevalence of insecurity.

In all societies, the pursuit of security always involves certain security tradeoffs or costs, which means that other goals that could have been pursued with the resources devoted to security are being sacrificed (Schneier, 2006; Adu-Amanfoh, 2014). The opportunity cost of security, particularly regime security, seems to be high in African countries, particularly sub-Saharan Africa, where numerous and diverse human development challenges, such as widespread misery and poverty, poor healthcare facilities, low life expectancy, low literacy, high levels of unemployment; and monumental corruption especially among high profile individuals, organizations and governments are competing for limited resources. It is important therefore that nation states in Africa strike a balance between these competing demands when investing in security.

In view of the devastations caused by contemporary security threats in Nigeria, it is pertinent to examine how the Nigerian state has

responded to the problem, particularly in terms of investment in security forces and how this has affected the capacity and interest of the state to deal with other human development challenges such as rising food prices and low purchasing power of the ordinary citizens due to massive poverty in the country, the high level of unemployment, lack of access to basic infrastructure and amenities (including basic healthcare), the rising cost of quality education, and the widening gap between the few 'haves' and the majority 'have-nots'.

Onu, Onuche and Onaji's (2016) study revealed that the various government responses to internal crisis eruptions in Nigeria include: troop deployments to crises ridden areas; the setting-up of commissions of enquiry to look into the outbreaks and their causes, which has always been an attempt to improve the diversity of government; the establishment of programmes to address cases of unemployment and poverty; the establishment of National Emergency Management Agency (NEMA) which deals with medical recovery and relief in emergency responses, etc. Of all these measures, the deployment of troops to crisis areas and equipping the security forces generally appear to constitute the largest capital investment that often goes by the name 'security votes'.

According to Hussaini (2016), 'the Nigerian government has spent over five billion US dollars in prosecuting the war on terror, resources which could have been invested in the productive sector of the economy'. As Professor Isaac O. Albert observed at the International Dialogue on Money, Security and Democratic Governance in Africa, 'what the Nigerian government spent on the war against Boko Haram is enough to build a new North-East Nigeria' in the same way the money spent on military operations during the Ogoni crisis of the 1980s as a result of oil spillage in the Niger Delta was enough to create a new Niger Delta in the country.

What is more, going by the huge percentage of the annual budget allocated to security agencies on a yearly basis in Nigeria, one cannot help suspecting that insecurity is costing Nigeria so much, often at the expense of forgone alternatives such as infrastructure and human

capital development (Onu, Onuche & Onaji, 2016). In this regard, Minti's (2016) submission helps to reveal the huge financial burden that terrorism has imposed on Nigeria: Starting from the huge yearly allocation to security and expenditure on the amnesty programme, the country in the 2016 budget allocated N919 billion to security units, including the Niger Delta Ministry/Amnesty Programme. This figure is more than half of Capital Expenditure budgeted at N 1.688 trillion, after deducting debt servicing.

Plangshak (2019) conducted a study to address the question of how investment in state security forces has affected the capacity and interest of African states to deal with other human development challenges, using Nigeria as its empirical core. In particular, the Nigerian state's response to contemporary security challenges in the country, such as insurgency and terrorism, kidnapping, and herders-farmers' conflicts, provides the basis for the discussion. Based on secondary data analysis, the article argues that enormous resources have been invested in security forces in Nigeria since independence in 1960, at the expense of fixing other basic human development challenges such as widespread misery and poverty, poor healthcare facilities, low life expectancy, low literacy, high levels of unemployment, and monumental corruption especially among high profile individuals, organizations and governments. The article emphasizes the cost of counter-insurgency in terms of huge budgetary allocations to the security forces, especially how this has crowded out resources from other human development challenges in the country.

Asamaowei (2021) captured that the Nigerian government through its counterterrorism operations in the north east of Nigeria which involves the execution of decapitation operations on Boko Haram leadership using special operations forces, targeted airstrike and outright offensive gun-battle has been able to reduce the potency of the group. As a result, the kidnapping of government officials and other Nigerians, the bombing of oil companies and vandalism of property by militants in the Niger-Delta region, the increased incidents of banditry, which includes kidnappings and cattle rustling, and the

Boko Haram attacks in Nigeria's north are all considered acts of terrorism. Sezgin (2003) examined the relationship between military spending, terrorism, and the economy. It was established that the state had two ways to refrain from terrorist attacks. They may either increase spending on defence or invest in education and health to boost the wellbeing of people who could be involved with terrorist acts.

Holbrook (2009) conducted a study on meeting challenges to sustainable development through science and technology education. The researcher shown that science and technology education must do more than simply pay 'lip service' to sustainable development and must focus learning on issues of relevance facing society. As opined by Misiroglu (2003), because the enemy is not one particular country, but rather a somewhat elusive entity, political scientists have likened the war on terrorism in some respects to cold war which requires being fought at home and abroad through multiple operations, including diplomatic, financial, investigative, humanitarian, and homeland security efforts. With terrorism being regarded as cold war, continuous pressure from the world will cause the collapse of terrorism just as continuous pressure from many nations caused communism to collapse from within.

Still on, curtailing terrorism in Nigeria should top the agenda of the government in the drive towards national security and development, after all, without peace, little can be achieved in the desecrated terrorist's attack regions, hence, no peace, no security and/or development.

Furthermore, sensible investment in security requires that African countries move beyond efforts at maintaining the nation-state and improving regime security, and start focusing on addressing the complicated human development challenges currently facing most parts of the continent. This way, the entire region with all its diversity, complexity and heterogeneity would not continue to occupy a place in the world that is 'nearly synonymous with failure and poverty'. To curtail the problem and prevent even more disastrous security threats, the present administration and subsequent governments in the country must go beyond the rhetoric of 'the

change mantra' which is attractively anchored on improving security, tackling corruption and revitalizing the national economy, to urgently addressing the untold hardships that the recent economic recession has brought upon many Nigerians through practical policies and programmes that will cushion the impact of the recession. One of the ways to achieving this is to recognize that improving security goes beyond matters of national defence or law and order. It encompasses all economic, political and social issues, enabling a life free from risk, fear and want. Hence, this article investigated ways of resolving human development issues in Nigeria through Mathematics.

Statement of the problem

In spite of the laudable benefits accruable to man from Mathematics, many Nigerian societies still suffer the pain of development. This is why many youths roam about the city looking for insufficient white collar jobs. This situation is worrisome as some of these youths are Mathematics graduates. This brings down the possibilities of the nation's opportunity of industrial and economic development as well as wealth creation. This situation has made Nigeria to technologically depend on other countries. The industries are not cared for and those making effort on their own to create wealth are not encouraged.

Also, the security challenges in various part of the country discourages investors from investing in the country and this mar development. Most studies has been done on strategies of curbing security challenges in the country but none has been done on the application of Mathematics in resolving human development issues in the country; they seem to leave Mathematics in their possible solutions. Meanwhile, human development issues cannot be achieved without Mathematics. Therefore, there arises the need to investigate the application of Mathematics in resolving human development issues in Nigeria.

Objectives of the study

1. The application of Mathematics in resolving human development issues in Nigeria.
2. The effects of terrorist attacks on human development in Nigeria.

3. Response(s) of the Nigerian state (in terms of investment in security forces) towards resolving human development issues in Nigeria.

Research questions

1) What are the roles (applications) of Mathematics in resolving human development issues in Nigeria?

2) What are the effects of terrorist attacks on human development in Nigeria?

3) What has been the response(s) of the Nigerian state (in terms of investment in security forces) towards resolving human development issues in Nigeria?

Research method

This study adopted descriptive survey design. This was because the design is capable of exploring a situation as it exists during investigation. Descriptive survey design also employs opinion poll in order to determine the respondents' preference, attitudes and perceptions. The design allowed the researcher to describe in detail and interpret the findings vis-a-vis information obtained. It was therefore adopted in this research to examine the various ways of resolving human development issues in Nigeria through Mathematics. The study population consisted of 724 Mathematics educators from the three Education Zones in Cross River State. The convenient non-probability sampling technique using Yamane's formula was adopted for this study.

The sample of this study constituted two hundred and fifty-eight (258) respondents was drawn using a convenient non-probability sampling technique by applying Yamane's formula. A structured researcher's-developed questionnaire titled: "Resolving Human Development Issues in Nigeria through Mathematics Questionnaire (RHDINMQ)" was used for data collection. This

instrument consisted of 3 items with five (5) subscales namely: application of Mathematics in resolving human development issues in Nigeria; effects of terrorist attacks on human development in Nigeria, and response(s) of the Nigerian State (in terms of investment in security forces) towards resolving human development issues in Nigeria. Each of the subscales constitutes an adapted 4 point Likert scale with five items. The respondents were expected to indicate their extent of agreement or disagreement to the items via Strongly Agree (SA), Agree (A), Disagree (D), and Strongly Disagree (SD). The instrument was validated by three experts; two of them were Mathematics experts while the other was from Tests and Measurement unit of the department of Educational Foundations, all in University of Calabar. They scrutinized the questionnaire items to ensure that the items were properly worded in content without ambiguity after which a trial test was conducted.

The reliability of the instrument was calculated using Cronbach Alpha. The questionnaire had a reliability coefficient ranging from 0.73 to 0.81. The researchers administered the copies of the questionnaire with the help of three trained research assistants to all the Mathematics educators in three Education Zones of Cross River State. The researcher developed a coding sheet after collecting the questionnaires and assigned codes/scores to each items. Therefore, in order to analyze the data, the frequency counts for each category of response were computed as well as the percentages.

Results and Discussion

Data collected through the copies of the questionnaire administered were analyzed using frequency counts, mean and standard deviation.

Research Question one: What are the roles (applications) of Mathematics in resolving human development issues in Nigeria?

TABLE 1: Summary of descriptive statistics on the roles (applications) of Mathematics in resolving human development issues in Nigeria (N= 258)

S/N	Items	SA	A	D	SD	Mean	StD
	Applications of Mathematics in Resolving Human Development Issues in Nigeria						
1	Mathematical knowledge helps in forecasting the future	102	90	63	61	2.42	1.04
2	Mathematics encourages critical thinking for better improvements on my present job	94	104	60	58	2.18	0.98
3	Mathematics helps in better decision making for future	108	94	61	59	2.22	1.12
4	Mathematics helps in research for more improvements and gain	103	98	70	56	2.04	1.06
5	The importance of Mathematics has changed my negative attitude towards it	95	105	78	66	2.26	1.16

Average mean = 2.22; Standard Deviation =1.07

Table 1 on the roles (applications) of Mathematics in resolving human development issues in Nigeria showed the average response mean of 2.22 and standard deviation of 1.07. The result indicated that the average response mean is more than 1/5 of the standard deviation. This implied that there is a low disparity in the response of the respondents but pointed towards a positive direction. This result implies that applications of Mathematics has not impacted on

resolving human development issues in Nigeria. This is because the government have not been integrating mathematics educators on issues of resolving human development and doesn't regularly organize seminars/workshops to train mathematics educators on issues of resolving human development.

Research question two

What are the effects of terrorist attacks on human development in Nigeria?

TABLE 2: Summary of descriptive statistics (frequency count) on the effects of terrorist attacks on human development in Nigeria (N= 258)

S/N	Items	SA	A	D	SD	Mean	StD
	Effects of Terrorist Attacks on Human Development in Nigeria						
1	Terrorism has cause person to become homeless	107	92	63	55	2.23	1.05
2	Terrorism is a source of wealth creation	75	83	91	102	2.26	1.14
3	Terrorism leads to poverty	96	103	70	69	2.18	1.07
4	Terrorism leads to underdevelopment	108	94	62	66	2.28	1.22
5	Terrorism causes migration of citizens	97	95	67	70	2.25	1.23

Average mean = 2.24; Standard Deviation =1.14

Table 2 on the effects of terrorist attacks on human development in Nigeria showed the average response mean of 2.24 and standard deviation of 1.14. The result indicated that the average response mean is more than 1/5 of the standard deviation. This implied that there is a low disparity in the response of the respondents but pointed towards a positive direction. This

result implies that effects of terrorist attacks has not impacted on human development in Nigeria. This is because the government have not been integrating mathematics educators on issues of resolving human development and doesn't regularly organize seminars/workshops to train mathematics educators on issues of resolving human development.

Research question three

What has been the response(s) of the Nigerian state (in terms of investment in security forces) towards resolving human development issues in Nigeria?

TABLE 2: Summary of descriptive statistics (frequency count) on the response(s) of the Nigerian state (in terms of investment in security forces) towards resolving human development issues in Nigeria (N=258)

S/N	Items	SA	A	D	SD	Mean	StD
	Response(s) of the Nigerian State (in Terms of Investment in Security Forces) towards Resolving Human Development Issues in Nigeria						
1	Government provide guards in forests and farmland	74	81	98	96	2.20	0.92
2	Government agencies sponsor terrorists	84	89	96	98	2.27	1.08
3	Government prosecute any terrorists caught	97	109	70	75	2.05	1.14
4	Government pays leap service to security challenges	68	81	98	95	2.31	0.73
5	Government provides amnesty to terrorists	64	70	112	92	2.28	0.87

Average mean = 2.22; Standard Deviation =0.95

Table 3 on the response(s) of the Nigerian state (in terms of investment in security forces) towards resolving human development issues in Nigeria showed the average response mean of 2.22 and standard deviation of 0.95. The result indicated that the average response mean is more than 1/5 of the standard deviation. This implied that there is a low disparity in the response of the respondents but pointed towards a positive direction. This result implies that

response(s) of the Nigerian state (in terms of investment in security forces) has not impacted on resolving human development issues in Nigeria. This is because the government have not been integrating mathematics educators on issues of resolving human development and doesn't regularly organize seminars/workshops to train mathematics educators on issues of resolving human development.

DISCUSSION OF FINDINGS

The discussion of findings is based on the sub-variables of the article as follows:

1) Applications of Mathematics in resolving human development issues in Nigeria

Descriptive statistics on the roles (applications) of Mathematics in resolving human development issues in Nigeria showed the average response mean of 2.22 and standard deviation of 1.07. The result indicated that the average response mean is more than 1/5 of the standard deviation. This implied that there is a low disparity in the response of the respondents but pointed towards

a positive direction. This result implies that applications of Mathematics has not impacted on resolving human development issues in Nigeria. The finding is in disagreement with the earlier position of Ukpata and Agha (2012) who conducted a study to examine whether the study of mathematics as a subject or course has any significant relationship with Nigerian National Development. The methodology used to elicit data for the analysis was a simple random sampling technique by which a total of 100 respondents were selected from three faculties of the Kogi State University, including the bursary department. The study revealed that

“mathematics” as a field of study, was the only key to technological breakthrough in any given society.

The finding is also in disagreement with the view of Alio and Anaeché (2020) who conducted a study to investigate the various ways of application of Mathematics in industrial development and wealth creation in Nigeria. It adopted a descriptive survey research design. The population of the study consisted of 1308 personnel from Enugu state Ministry of Commerce and Industry and a cross section of 53 Mathematics educators. A sample of two hundred respondents was drawn using a convenient non probability sampling technique. Among the findings were that Mathematics can be applied in industrial development and wealth creation in Nigeria through helping an individual to forecast for the future, carry out research on industrial prospects and to take decision.

2) Effects of Terrorist Attacks on Human Development in Nigeria

Descriptive statistics on the effects of terrorist attacks on human development in Nigeria showed the average response mean of 2.24 and standard deviation of 1.14. The result indicated that the average response mean is more than 1/5 of the standard deviation. This implied that there is a low disparity in the response of the respondents but pointed towards a positive direction. This result implies that effects of terrorist attacks has not impacted on human development in Nigeria. The finding is in disagreement with the earlier position of Siddique, Liaqat and Ullah (2017) who examine the effect of terrorism on domestic investment as well as foreign direct investment. The study covered the 1980 – 2015 sample periods. The autoregressive distributed lag bound testing co-integration approach was employed. The study found a long-run relationship between terrorism and investment. A negative effect of terrorism on both domestic and foreign investments was also found. The finding likewise relates with the earlier position of Sami and Khattak (2017) who examine the long and short-run impact of terrorism on the economic growth of Pakistan during 1980 – 2016. The study employed the Auto Regressive Distributed Lag (ARDL)

approach to co-integration. The findings showed that terrorism huddles economic growth.

3) Response(s) of the Nigerian State (in Terms of Investment in Security Forces) towards Resolving Human Development Issues in Nigeria
 Descriptive statistics on response(s) of the Nigerian state (in terms of investment in security forces) towards resolving human development issues in Nigeria showed the average response mean of 2.22 and standard deviation of 0.95. The result indicated that the average response mean is more than 1/5 of the standard deviation. This implied that there is a low disparity in the response of the respondents but pointed towards a positive direction. This result implies that response(s) of the Nigerian state (in terms of investment in security forces) has not impacted on resolving human development issues in Nigeria. The finding is in disagreement with the earlier position of Plangshak (2019) who conducted a study to address the question of how investment in state security forces has affected the capacity and interest of African states to deal with other human development challenges, using Nigeria as its empirical core. In particular, the Nigerian state’s response to contemporary security challenges in the country, such as insurgency and terrorism, kidnapping, and herders–farmers conflicts, provides the basis for the discussion. Based on secondary data analysis, the article argues that enormous resources have been invested in security forces in Nigeria since independence in 1960, at the expense of fixing other basic human development challenges such as widespread misery and poverty, poor healthcare facilities, low life expectancy, low literacy, high levels of unemployment, and monumental corruption especially among high profile individuals, organizations and governments. The article emphasizes the cost of counter-insurgency in terms of huge budgetary allocations to the security forces, especially how this has crowded out resources from other human development challenges in the country.

CONCLUSION

This study was focused on the various ways of resolving human development issues in Nigeria through Mathematics. The study revealed that mathematics is very central in the nation's human development and that without the knowledge of mathematics most executives are devoid of logical reasoning and thinking. From the results of various respondents, it is an indubitable fact from the issues raised that, mathematics plays an indispensable role in national development and therefore, to think unmathematical is to think naive, irrational, and unscientific which retard technological advancement of a nation. For workers to be sound mathematically is to make them technology driven. To think mathematical, is to think fast, act fast, work fast, solve problems fast, produce fast and to develop fast. This is the realm of those who think mathematical.

This article stressed that terrorism is an impediment to development in Nigeria and has increased violation of human rights whilst deepening insecurity in the society. The social ills experienced in Nigeria are both a means and end to terrorism in Nigeria, thus to ensure sustainable development and national security in Nigeria, it is imperative that terrorism is nipped in the bud. Cushioning the adverse effects of terrorism will surely pave way for a meaningful, systematic, holistic and responsible development which will be co-operative, responsive and co-responsible in its entirety.

RECOMMENDATIONS

1. Since mathematics enhances the level of human reasoning and further develop the mind, technical and generic courses undertaken by staff in any industry should continuously incorporate some level of mathematics in their training curricula. This will further develop the minds of our present and future leaders for better decision making and be more scientific in general management and public administration.
2. If workers are consistently made to undergo mathematical drilling in their training programmes irrespective of the industries they belong to, analytical and thinking ability will be refined, scientifically modeled which will

3. ultimately result into higher productivity that would lead to technological breakthrough.

4. There should be effective and functional mathematics education at all levels in order to transform skills realized for mathematics to solve the nation's security challenges

5. The nature of the borders which is influenced by the weak security system has major security consequences and as such, the government must ensure that it is closely monitored.

6. Nigerian Custom Service and the Nigerian Police to ensure that illegal weapons are not smuggled into the country and also checkmate the influx of migrants from neighboring nations, who are among the perpetrators of terrorist attacks in the country.

7. Government should emphasize the cost of counter-insurgency in terms of huge budgetary allocations to the security forces, especially how this has crowded out resources from other human development challenges in the country.

8. Tactical exploration of the diplomatic option in an attempt to come to terms with legitimate (if any) grievances of the terrorist sects.

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