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Unlocking Artificial Intelligence (Ai) For Humanitarian Development in Nigeria - Prospects, Pitfalls and Future Outlook

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Abstract

This study examines the possibilities, drawbacks, and prognosis of using artificial intelligence (AI) to improve humanitarian development in Nigeria through enhanced decision-making, data analysis, and resource allocation. Relying on the Humanitarian Development Framework Theory, and extant literature, the study highlights AI's potential to support humanitarian development in the country. The three specific objectives of the study are to (i) examine the prospects of AI in humanitarian development in Nigeria; (ii) identify the pitfalls of AI adoption in humanitarian development in Nigeria; and (iii) explore the future outlook of AI in humanitarian development in Nigeria. Study findings reveal that while improved efficacy and efficiency of response are among the benefits of AI, poor data quality, infrastructure gaps, funding constraints, acceptance in society, and legal and ethical considerations are major drawback factors that must be addressed for AI to thrive. Also, AI has the potential to impact a broad selection of areas including policy and regulatory frameworks; integrated, human-focused and context-specific responses; enhanced infrastructures; greater acceptance in society; and social inclusion and equity. Key recommendations include: providing context-specific and human-centered AI solutions that are responsive to cultural differences and local demands; investing in upskilling and training of local stakeholders to efficiently utilize AI; strengthening stakeholder alliances to promote more coordinated responses; addressing moral issues and guaranteeing responsibility in the creation and application of AI,

creating explicit legal and regulatory structures to guarantee ethical AI innovation and effective governance; and promoting the use of AI for social good while prioritizing humanitarian development.

Keywords: Artificial Intelligence (AI); Humanitarian Development; Prospects and Pitfalls; Future Outlook; Nigeria

Introduction

Nigeria's humanitarian development sector faces several challenges including insecurity, climate change, illnesses and human displacement. Governments and humanitarian organizations have invested in conventional aid approaches; however, such approaches frequently have drawbacks such as poor resource allocation, poor data-driven decision-making, and insufficient ability to handle complicated emergencies. Novel approaches to enhance responsiveness and development results require immediate attention; hence, artificial intelligence (AI) emerges as a potentially revolutionary tool for strengthening statistical analysis and identification of trends, prediction and modelling of probabilities, response preparation, distribution of resources, and creative problem-solving for intricate situations.

Artificial intelligence (AI) is among the digital technologies that are gradually changing the humanitarian sector; for instance, the COVID-19 pandemic expedited the utilization of digital technology in support of humanitarian endeavours (Rejali and Heiniger, 2021; Beduschi, 2022). However, there are dangers in using AI in the humanitarian development sector which have drawn the attention of academics and human rights activists; these dangers range from the perils of "surveillance humanitarianism" to the excess of "techno-solutionism" and issues surrounding a possible resurgence of "techno-colonialism." These dangers pose serious concern because they have the potential to cause more damage and human rights abuses to people who are already impacted by disasters or war (Duffield, 2016; Latonero, 2019; Madianou, 2019; Molnar, 2020; Weitzberg et al., 2021). It is pertinent for humanitarian organizations to establish suitable frameworks to improve accountability and transparency in the application of AI in the humanitarian context before implementing such technologies. In general, these approaches would help achieve the objective of maximizing the potential for the ethical use of AI in humanitarian efforts (Beduschi, 2022).

AI's ability and potential to enhance data analysis, decision-making, and distribution of assets makes it relevant in the transformation of

Nigeria's aid sector. However, for the humanitarian sector to completely benefit from AI, several challenges must be addressed while new possibilities must be taken advantage of. Unlocking AI's potential for humanitarian development will enhance stakeholders' responsiveness, improve data-driven decision-making, and enhance resource optimization and distribution while addressing emerging challenges such as conflicts, health disasters and other complex humanitarian emergencies including natural disasters. This study therefore examines the benefits, constraints and prospects of AI-driven humanitarian development in Nigeria, and highlights the importance of community ownership and involvement of stakeholders towards its sustainability and ethical application.

Statement of Problem

Nigeria, a nation with enormous humanitarian needs, finds it difficult to address its developmental challenges particularly conflicts, human displacement, medical emergencies, and natural and human-induced disasters. The complexity and scope of these challenges are often too cumbersome for the traditional humanitarian response approach which is often characterized by detached activities, insufficient asset allocation, and poor data-driven decision-making in practice. AI offers a revolutionary prospect to improve response efficacy, sustainability and efficiency. However, when AI is used in situations where disadvantaged people are involved, important concerns regarding equality, prejudice, data privacy, and other unexpected effects are often raised (VOICE, 2023).

Nigeria's humanitarian sector faces several challenges in implementing AI such as limited knowledge about its potential benefits and uses, insufficient resources and facilities, limited technical know-how and capacity, legal and ethical concerns, dependence on external funding and support, poor community ownership, and a limited number of context-specific solutions. These challenges lead to unproductive use of resources, poor responses to complex emergencies, paucity of information-driven choices, inadequate stakeholder participation and cooperation, and limited opportunities for creativity and sustainability. This is made worse by the constantly changing character of humanitarian emergencies which calls for creative and adaptable remedies, the requirement for AI applications that are context-specific and catered to Nigeria's peculiar challenges and environment, and the significance of guaranteeing responsible AI creation and application which prioritizes individual responsibility and fulfilment.

This study seeks to address these challenges and unlock AI's contributions to Nigeria's aid sector by examining the potential and applications of AI, identifying and analyzing the obstacles to AI adoption, and developing a vision for AI-driven humanitarian development that emphasizes responsible innovation, local ownership and collaboration.

Significance of the Study

This study is important because it explores the possibilities of using AI to address humanitarian challenges, close the knowledge divide, inform policy and practice, advance equitable development, boost efficacy, encourage cooperation, empower community stakeholders, address moral dilemmas, contribute to international conversation, and create room for additional studies.

Study Objectives

The overall objective of this study is to explore the prospects, pitfalls and future outlook of Artificial Intelligence (AI) in Nigeria's humanitarian development sector.

The Specific Objectives are to:

  i.   Examine the prospects of AI in humanitarian development in Nigeria;

  ii.   Identify the pitfalls of AI adoption in humanitarian development in Nigeria;

  iii. Explore the future outlook of AI in humanitarian development in Nigeria;

Study Questions

  i.   What prospects does AI have for humanitarian development in Nigeria?

  ii.   What are the pitfalls of AI in humanitarian development in Nigeria?

  iii. What is the future outlook of AI in humanitarian development in Nigeria?

Methodology

This study analyzes secondary data drawn from journal articles, specialized databases, search engines, and other credible and relevant secondary sources on artificial intelligence and humanitarian development in Nigeria.

Operational Definition of Key Terms

Artificial Intelligence: is used to describe the creation of computer systems that are capable of learning, solving problems, and making decisions, that is, tasks that normally require human intellect.

AI for Social Good: refers to the use of AI to solve ecological and societal issues including income disparity, poverty, and climate change.

AI-Powered Humanitarian Innovation: This means creating cutting-edge AI solutions to deal with difficult humanitarian issues.

Development-AI: refers to the use of AI to promote the development of infrastructure, growth in the economy, medical care and educational development.

Future Outlook: This highlights possible future paths and developments in Nigeria's AI-driven humanitarian sector with a focus on cooperation, community involvement, and responsible development.

Humanitarian AI: refers to the use of AI to improve the provision of services, distribution of resources, and evaluation of needs in humanitarian aid.

Humanitarian Development: covers activities aimed at enhancing the resilience and general well-being of communities that are at risk such as long-term prosperity, settling disputes, and emergency response.

Pitfall: refers to a potential danger, difficulty, or barrier that may prevent AI from being effectively adopted and used in Nigeria's aid sector.

Prospects: refers to the advantages and opportunities that AI adoption may present for d humanitarian development including enhanced evaluation of information, more effective distribution of resources, and preparedness.

Theoretical Framework

The Humanitarian Development Framework Hypothesis, which highlights the significance of humanitarian action in attaining sustainable development, forms this study's theoretical foundation. The Framework refers to the link between emergency humanitarian aid and longer-lasting support for development provided to those impacted by disasters (CALP Network, 2024). It also refers to "the transition or overlap between the delivery of humanitarian assistance and the provision of long-term development assistance" (Strand, 2020). The Framework facilitates a better understanding of the Nigerian humanitarian setting, the guiding principles, and AI's role in improving humanitarian development results.

The Framework acknowledges the relationship between efforts in development and humanitarian relief and serves as a roadmap for governments, civil society organizations, the United Nations and other humanitarian agencies in creating and implementing humanitarian responses that support sustainable development objectives. Accordingly, the 2016 World Humanitarian Summit brought increased emphasis to the relationship between development and humanitarianism (Lie, 2020). Emphasis shifted from a response-based strategy to a framework for eliminating emergency needs by tackling the factors that increase hazards and make people susceptible. To support this shift towards resilient, self-sufficient, and sustained recovery, the humanitarian, development and peace nexus framework was introduced, and advocates for more coordination between financing for development and emergency assistance as well as peacekeeping and dispute resolution initiatives (IOM, 2024). The "New Way of Working" was launched under the Agenda for Humanity by the United Nations Secretary-General after the World Humanitarian Summit in 2016 as a top priority and mandate for key actors in the development and humanitarian sectors to cooperate towards achieving "collective outcomes", that is, to lessen needs, risks, and vulnerabilities for a long time.

Applying Humanitarian and Development Framework Theory to Study Objectives

Applying the Humanitarian Development Framework Theory requires reliance on these principles: neutrality and impartiality, the humanitarian imperative of saving lives and alleviating suffering, participation and empowerment, Do No Harm, and accountability and openness. This is discussed in line with the study objectives below.

Overall Objective - To explore the prospects, pitfalls and future outlook of Artificial Intelligence (AI) in Nigeria's humanitarian development sector

The Theory aligns with the principles of neutrality and impartiality (to ensure that AI-driven initiatives promote neutrality and impartiality); humanitarian imperative (to prioritize AI applications that address urgent humanitarian needs); and participation and empowerment (to recommend AI solutions that empower affected communities).

Objective 1 – To Examine the Prospects of AI in Humanitarian Development in Nigeria
The Theory examines how AI might strengthen ties between development and humanitarian efforts in Nigeria) and explores how AI can help meet the country's unique humanitarian needs.

Objective 2 – To Identify the Pitfalls of AI Adoption in Humanitarian Development in Nigeria

The Theory promotes approaches for guaranteeing accountability and transparency in AI-driven humanitarian projects, and the principle of "Do No Harm" in evaluating possible hazards and unforeseen repercussions of AI adoption in Nigeria's humanitarian contexts.

Objective 3 – To Explore the Future Outlook of AI in Humanitarian Development in Nigeria

The Theory analyzes opportunities for cooperation among stakeholders to fully realize the potential of AI through partnerships and collaboration and evaluates methods for enhancing local capacity towards the effective utilization of AI in Nigeria's humanitarian context.

Unlocking Artificial Intelligence for Humanitarian Development in Nigeria

Artificial Intelligence (AI) has the potential to completely transform humanitarian development in Nigeria by enhancing productivity, effectiveness, and creativity across a range of industries including healthcare, education and economic empowerment. Nigeria's AI industry is expected to develop at a compound annual growth rate (CAGR) of 44.2%, reaching an estimated $434.4 million by 2026; this impressive growth highlights the increasing use of AI solutions due to technology improvements and creative applications in several

industries such as banking, agriculture, healthcare, and telecommunications (NITDA). Interestingly, these industries have cross-cutting relationships with the humanitarian development sector.

As the first African country to establish a National Centre for AI and Robotics (NCAIR) and create specialized government institutions for promoting the development of AI systems and a knowledge-based economy, Nigeria can be regarded as a continental leader in AI. Consequently, the Nigerian Government through the Federal Ministry of Communication, Innovation and Digital Economy (FMCIDE) recently developed Nigeria's National AI Strategy (NAIS), 2024 towards achieving the vision "to be a global leader in harnessing the transformative power of AI through responsible, ethical, and inclusive innovation, fostering sustainable development through collaborative efforts" (NITDA, 2024). Building on the nation's groundbreaking establishment of the National Centre for AI and Robotics (NCAIR) and numerous AI-specific governmental efforts to encourage an economy built on knowledge and foster development and research in AI systems, Nigeria will once again establish itself as a leader in AI adoption on the African continent with the implementation of this historic AI Strategy which aims to utilize the revolutionary power of AI to spur inclusive growth, human wellness, creativity and national productivity. The NCAIR operates as a digital laboratory for advancing AI innovation and talent development and serves as a special-purpose entity run by the National Information Technology Development Agency (NITDA) to promote AI systems in Nigeria (Effoduh, 2021). The Strategy has five key pillars: building foundational AI infrastructure, building and sustaining a World-class AI ecosystem, accelerating AI adoption and Sector transformation, ensuring responsible and ethical AI development, and developing a robust AI governance framework (NITDA, 2024).

Based on its performance, Nigeria was placed 138th out of 172 countries in Oxford Insights' AI Readiness Index (2020) which evaluates how AI is being adopted for the public good; the 2023 Index ranked Nigeria 103 out of 193 countries. According to Heldreth et al. (2019), most AI solutions are developed and/or owned by individuals or institutions while the Office of the Vice President supervises AI projects. Notwithstanding its prospects, the humanitarian sector in Nigeria is yet to fully embrace AI due to poor infrastructure and resource availability, limited technological knowledge and skills, and ethical and legal issues. For instance, despite the boom in IT firms in Nigeria, the country still faces inadequate data collection and digital storage while cloud computing is still low as a result of infrastructure-related issues, security risks, and economic constraints (Ogunleye, 2021).

Discussion of Findings

Overall Objective - To explore the prospects, pitfalls and future outlook of Artificial Intelligence (AI) in Nigeria's humanitarian development sector

Artificial intelligence is generally defined as "a collection of technologies that combine data, algorithms, and computing power;" these technologies comprise software (and sometimes, hardware) systems created by people that, considering a complicated objective, operate within the Internet of Things or physical realm by using data collection to understand their surroundings, analyze the organized or unorganized data that has been gathered, applying knowledge or process information generated by this data to determine the best course of action (European Union, 2019; European Commission, 2020). AI technologies can assist aid organizations in bringing about a fundamental shift in their approach to providing aid in wars or emergencies from a reactionary to a predictive strategy (Lowcock, 2019). Digital technologies are often utilized by humanitarian actors to support and safeguard communities afflicted by wars and disasters (Meier, 2011).

Artificial Intelligence (AI) can assist humanitarian actors in shifting from reactive to predictive humanitarian response (Beduschi, 2022). According to VOICE (2023), the use of AI for humanitarian efforts represents a paradigm shift in the area by fusing state-of-the-art technology to save lives and alleviate human suffering; thus, AI's use as a tool for aid work is indicative of a larger trend in many industries towards digital transformation. AI can promote effectiveness, efficacy, and impact in various sectors and activities including catastrophe risk mitigation and response, resource allocation, emergency education, and food aid.

The policy and legal frameworks that influence AI application in Nigeria include: the National Information Technology Development Agency Act (NITDA Act), 2017 empowers the Agency to create policies for electronic governance and data exchange and to ensure that other electronic communication transactions are used in place of paper-based government processes; NITDA Data Regulation, 2019 protects the right to privacy of natural persons who are Nigerian residents or who are natural persons descended from Nigeria but live outside the country; Data Interoperability Standards, 2016 establishes guidelines for enhancing data exchange among groups that share data without the need for intricate interventions; National Health

Research Ethics Committee, 2017 guaranteed the utmost ethical level of protection for human subjects involved in scientific research; and National Research and Innovation Council, 2019 establishes national goals for growth, creativity, and scholarship. There was a call for the development of the National Artificial Intelligence Policy in 2022 (Premium Times, 2022). These policies and laws jointly address AI-related critical issues including data protection, technology transfer, innovative research, and cybersecurity.

Objective 1 – To Examine the Prospects of AI in Humanitarian Development in Nigeria

Artificial Intelligence (AI) has the potential to improve humanitarian response through enhanced evaluation of requirements, distribution of resources, and emergency preparedness. AI's help with humanitarian readiness can be achieved through the rapid processing of enormous volumes of intricate information, identifying information trends, drawing conclusions, and offering significant information about possible hazards before the occurrence of an emergency or catastrophe. AI technology provides opportunities to enhance humanitarian aid and advance recovery initiatives, particularly in cases of extended hostilities. For instance, disaster alerts can be promptly detected through the use of machine learning algorithms that examine sensor data and satellite pictures. According to Beduschi (2022), humanitarian organizations are often testing and implementing several AI-based initiatives such as AI systems for mapping areas impacted by humanitarian crises, identifying missing people and anticipating population movements; these AI systems help to inform and facilitate humanitarian actions in the field.

Overall, AI has the potential to significantly improve Nigeria's humanitarian development in several ways including: improved requirements appraisal of big datasets to identify trends and forecast needs that allow for more efficient resource allocation; increased response efficiency through chatbots and virtual assistants driven by AI which can fast-track procedures, improve response time and promote effective communication; streamlined logistics and better supply chain management for guaranteeing help and timely arrival of resources; better monitoring and evaluation to determine programme efficiency and pinpoint areas for improvement; supporting novel funding mechanisms such as social impact bonds to draw in new funding sources; collaborations and cooperation among stakeholders for enhanced coordination and response; provision of insights into local contexts to enable more culturally sensitive and successful programming; and data-drive decision-making to enhance resource

distribution. Also, AI can help to customize interventions to meet individual needs, improve effectiveness and reduce waste; facilitate capacity building by offering opportunities for training and upskilling; promote sustainability; predict and prevent crises such as disease outbreaks or natural disasters; analyze trends and patterns; increase transparency and accountability by facilitating tracking and monitoring of aid distribution; reduce corruption and ensure accountability.

Objective 2 – To Identify the Pitfalls of AI Adoption in Humanitarian Development in Nigeria

Pitfalls of AI adoption in Nigeria include poor data availability and quality, poor infrastructure and resources, shortage of technical capacity and expertise, ethical issues and prejudices, reliance on external funding and assistance, difficulties with community and cultural acceptance, deficiencies in laws and policies, cybersecurity hazards and data confidentiality concerns, unforeseen impacts and negative effects, and problems with sustainability and scalability. The humanitarian sector is gradually changing as a result of data-driven artificial intelligence (AI) technologies, yet there are serious hazards associated with these technologies for the safety of communities and vulnerable persons during times of crises and wars. For instance, according to OCHA (2024), the humanitarian sector is experiencing an increase in the use of AI; it is employed in evaluating information, creating chatbots for disadvantaged groups, and developing sustainable solutions for climate action. Though AI has the potential to benefit humanitarian endeavours, there are ethical, administrative, and inequality issues associated with the technology. AI systems are not neutral by nature; thus, their usage has the potential to put already vulnerable communities in unnecessary danger. For instance, in the context of widespread migration and refugee crises, AI-powered chatbots can expedite visa applications. However, if these systems are employed carelessly, they may expose an individual's confidential details to unnecessary cybersecurity threats and possible privacy breaches (Beduschi and McAuliffe, 2022). Data quality, algorithmic bias and respecting and protecting data privacy are key elements in enhancing humanitarian actions. In the humanitarian context, low-quality data produce unfavourable results that might directly impact communities already at risk from disasters or wars. AI systems that have been taught with biased, erroneous, or insufficient data will likely continue making these errors. Furthermore, because aid efforts are subject to several restrictions, it can be challenging to acquire excellent statistics for these activities (Beduschi, 2022; Kuner and Marelli, 2020). AI system bias has the potential to worsen

inequality and sustain both direct and indirect forms of discrimination, most notably based on race and gender (Sharkey, 2018). AI developers' dependence on external investors; outdated educational curricula; availability, accessibility and affordability of online courses are among the challenges of AI adoption in Nigeria (Adepetun, 2019; Heldreth et al., 2019). Minimal adoption of broadband, poor literacy levels, shortage of data ecosystem, lack of resources for AI research, and absence of a national identity system are among the pitfalls identified by Ogunleye (2021). Similarly, NITDA (2024) listed job displacement, bias and privacy among the top ethical and social concerns associated with artificial intelligence that also pose significant threats to its development in Nigeria. Having access to high-quality data is essential to creating trustworthy AI systems; regrettably, Nigeria encounters considerable obstacles concerning data collection, quality, accessibility and availability. According to the World Bank's 2020 "Nigeria Digital Economy Diagnostic" assessment, Nigeria has a poor rate of data collection. This suggests that further data from a variety of industries is needed which will impede the creation of AI models that might solve important problems in important industries. Biased AI systems may potentially erode public confidence in technology which might result in a decline in the uptake and even rejection of innovations (Ferrara, 2023). This misunderstanding may have dire social and economic repercussions for Nigeria. If the public considers AI as discriminatory rather than a source of development, the country may still need to appreciate the benefits of AI fully. Mistrust in AI can have far-reaching economic and societal consequences as the technology's potential advantages may not materialize if is viewed as biased or unreliable. This can worsen societal tensions and lead to lost chances for innovation and progress. Therefore, creating an atmosphere that is conducive to AI development in Nigeria requires tackling ethical and societal issues (NITDA, 2024).

Overall, though AI offers a lot of potential to improve humanitarian operations in Nigeria, there are several disadvantages to consider: AI requires high-quality, pertinent data which could be scarce in humanitarian settings; AI systems can perpetuate prejudice and discrimination if they are created with a certain perspective in mind or are trained on biased data; and humanitarian organizations may lack the infrastructure and technological know-how required for AI.

AI raises moral issues that require attention such as privacy, consent and accountability; an over-reliance on AI could lead to a decline in human ability and judgement; AI has the potential to eliminate jobs, particularly in data collection and analysis; interventions that are not

culturally sensitive may result from AI systems' lack of localization; AI systems may be the target of cyberattacks that compromise sensitive data; and AI projects may require large sums of money that may not be available in the long run. Inadequate legal frameworks have the power to preserve accountability while impeding the adoption of AI. Effective human-Ai system collaboration is crucial but it may be challenging to achieve; AI decisions can be opaque making it challenging to understand and trust AI-driven interventions, and because of the complexity of the environment, assessing AI's impact in humanitarian situations can be challenging. Furthermore, AI has the potential to exacerbate already-existing digital disparities, marginalizing some groups of people. AI systems do not fully understand local conditions thereby leading to ineffective solutions.

According to PwC (2019), three types of risks fall under the category of "National-Level" risks: social, ethical and economic. Economic risks include reputation and intelligence divide while ethical risks include lack of values and purpose misalignment. The socioeconomic context in which AI systems function is impacted by the broad range of hazards at the national level. These are problems that have to be addressed globally at the national, supranational, or social level. Since generative AI gained international attention, there has been additional danger of harm from badly built AI systems such as prejudice, deceptive models, and vulnerability to hostile actors. The brittleness of current systems makes them simple to manipulate and deceive with changes in inputs and changes in dataset features over time that jeopardize model dependability and have unforeseen repercussions are some of the factors contributing to subpar results (Matheny et al., 2019).

Objective 3 – To Explore the Future Outlook of AI in Humanitarian Development in Nigeria

The future of AI in humanitarian development lies in responsible AI innovation, prioritizing local ownership, context-specific solutions, and human-centered design. To scale AI-driven humanitarian efforts, partnerships between governments, corporations, and humanitarian organizations are essential. To effectively integrate AI in humanitarian situations and handle future difficulties, research and development efforts must be ongoing. Nigeria has excellent opportunities to utilize AI for humanitarian development since fresh advancements and possibilities are likely to happen.

In the future, there may be an increase in the adoption and integration of AI technologies; improved data collection, analysis, and

sharing capabilities that facilitate more informed decision-making; improved ability of local stakeholders to employ AI solutions efficiently; innovative and creative AI applications that tackle specific humanitarian issues such as medical emergencies, conflict resolution, and climate change; development and implementation of supportive legislative and regulatory frameworks that permit the responsible use of AI in humanitarian development; a stronger emphasis on local innovation, ownership, and context-specific AI solutions to reduce reliance on external interventions; and continuous advancement and evaluation of AI-driven initiatives to guarantee iterative improvement and successful impact. To promote a unified strategy for AI-driven humanitarian development, more collaborations across governmental organizations, non-profits, the commercial sector and academic institutions are also required. By anticipating and making plans for future events, stakeholders can utilize AI to positively promote humanitarian development in Nigeria.

Humanitarian actors are required under the "do no harm" principle to consider the likelihood that their acts or inactions may inadvertently cause harm to others or expose them to new risks. Therefore, mitigating risks and preventing harm are the fundamental components of this humanitarian obligation. The principle also recommends that those engaged in humanitarian aid consider developing a comprehensive framework that would give crucial accountability and responsibility for the use of AI in relief operations. Hazards and impact assessments can be used to implement the "do no harm" criterion. Both methods could be useful in lowering risks and preventing or decreasing negative impacts on affected populations (Beduschi, 2022).

To enhance the future outlook and potential for AI adoption in Nigeria, Heldreth et al. (2019) recommended the following actions: fairness should be given top priority (by enforcing the country's social ideals, the government can shift the focus of the machine learning debate from a scientific subject to a sociotechnical one); boost AI's awareness and communication (the government should give a truthful, fact-based picture of AI prospects and problems); modernize the curriculum and bring STEM education to the forefront; democratize data and promote appropriate data exchange; prioritize impact, and use justifications to foster trust.

AI has a promising future in Nigeria's humanitarian development because it can increase funding and uptake; provide the necessary infrastructure such as databases and digital education; teach and retrain local actors in the use of AI; create AI solutions tailored to the

specific humanitarian challenges faced by the country; prioritize human-centered design; ensure that AI solutions meet regional requirements; and strengthen stakeholder relationships to support a coordinated response; create and execute precise legislative and regulatory frameworks and guarantee efficient governance; emphasize the importance of AI for social good; address ethical concerns and guarantee accountability; advance an equitable and inclusive AI; and draw attention to Nigeria as a potential hub for AI innovation in Africa to support regional development.

Conclusion

Given the delicate circumstances in which humanitarian organizations operate, the use of AI requires cautious navigation; human responsibility and involvement are essential to AI-driven humanitarian development processes. This approach is based on the basic requirement that the ethical implications of applying AI be considered especially in underprivileged regions. Ensuring that AI applications adhere to humanitarian standards and the "do no harm" concept is imperative. Furthermore, the effective use of AI technology in humanitarian contexts depends on building trust via transparency and education. Prejudices must be addressed if equitable and workable solutions that take into account the diverse needs of communities affected by crises are to be developed.

Recommendations

Key recommendations for this study are as follows:

Overall Objective - To explore the prospects, pitfalls and future outlook of Artificial Intelligence (AI) in Nigeria's humanitarian development sector

It is necessary to ensure that marginalized populations benefit from AI by addressing digital inequalities; constantly tracking and assessing the efficacy of AI-driven projects; advancing AI for social benefit and prioritizing humanitarian development as well as placing Nigeria at the centre of Africa's AI revolution. It is also imperative that humanitarian organizations acknowledge that there is no universally applicable "one-size-fits-all" AI solution; and as Beduschi (2022) suggested, these organizations should assess AI systems before utilizing them particularly as they have the potential to harm their beneficiaries.

For AI solutions to be truly successful, they must be based on accurate and reliable data; thus, an effective AI ecosystem requires the

creation of an architecture that allows for data collection, sanitization, processing, utilization, distribution, and storage in private and public sectors. To encourage public participation and confidence, data architecture should be based on clear ethical standards while personal information should be safeguarded from collection to deletion at every turn. Also, this study supports the recommendation by Ogunleye (2021) that human rights impact analyses should be performed on AI technologies that are meant for public use; they must be weighed against the relevant rights enshrined in *Chapter IV of the 1999 Constitution of Nigeria* including rights to privacy regarding their homes, mail and communications. When enterprises and government institutions suffer a cybersecurity breach and lose consumer data, they should be required to immediately inform the public about such breaches and submit to an assessment of their security architecture. Breach resulting from insufficient investment in security measures should be met with penalties and other consequences.

Objective 1 – To Examine the Prospects of AI in Humanitarian Development in Nigeria

It is imperative to provide AI solutions that are tailored to the needs of humanitarian development and allocate resources towards enhancing the capabilities of local actors to successfully utilize AI.

Objective 2 – To Identify the Pitfalls of AI Adoption in Humanitarian Development in Nigeria
Policy and regulatory frameworks for responsible AI innovation should be developed and/or harmonized to address ethical issues and guarantee responsibility in the development and application of AI.

Objective 3 – To Explore the Future Outlook of AI in Humanitarian Development in Nigeria

Human-focused design for ensuring that AI solutions satisfy local requirements should be prioritized and promoted to encourage cooperation and collaboration among stakeholders to completely benefit from AI solutions.

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