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## **Harnessing Big Data for Peacebuilding in Nigeria**

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# Chapter Ten



## Harnessing Big Data for Peacebuilding in Nigeria

*Juliet Mamudu*

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### **Abstract**

This paper explores the place of Big Data in facilitating peacebuilding in Nigeria. The objective of the paper is to look at the areas where big data can foster peacebuilding in Nigeria and the likely challenges the effort could face in facilitating peacebuilding in Nigeria. Using literature research, the paper identified the following areas where Big data could help in peacebuilding: Migration, Hate Speech, Perceptions of exclusion, Monitoring and evaluation, Early warning and prediction. Although the likes of the huge financial costs

involved in purchasing licenses, equipment, capacity building and human resources are challenges to the usage of big data in peacebuilding. The study concludes that big data has the potential to revolutionize the process of collection and analysis of data required for peacebuilding, and eventually, the peacebuilding process itself. The paper recommends among others that government and NGOs that are into peacebuilding can build capacity of data analysts in peacebuilding to incorporate human ethos in data collation and usage in order to ensure fair and effective interventions.

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## **Introduction**

Increasing interconnectivity, mobility, the Internet of Things (IoT) and artificial intelligence (AI) are digital technological advancements which have led to big data, which primarily refers to extremely large and diverse collections of structured, unstructured, and semi-structured data that continues to grow over time. These datasets are usually large and with lots of complexities in terms of volume, velocity and variety, such that the traditional data management systems can hardly handle it especially in areas of storage, processing, and analyzing them (Google Cloud, n.d). As data continues to grow daily, new big data tools emerge to assist companies and the public sector to collect, process and analyze data faster.

Big data has been in use since the advent of computers and the generation of fast processing of information, but John Mashey is generally credited with popularising the term (Lohr, 2013). Big data is used in machine learning, predictive modeling, and advanced analytics to address problems or challenges and to allow for making informed decisions. With global development, big data is increasingly being harnessed in

different sectors, including agriculture, banking, education, governance, healthcare, international development, manufacturing, security, and in the private and public sectors. These sectors utilise big data and data analytics to optimise their operations, and make insightful, well-informed operational decisions (Isaac, 2019).

Furthermore, the roles played by big data in decision making include enhancing business intelligence, improving operational efficiency, driving innovation and growth (Gwani, 2023). Interestingly, Big Data has become an emerging factor of production which reflects on changing business models, industry transformation, market structures, and economies, which is opening new possibilities for beneficial outcomes in social, economic, infrastructural and public service delivery (NITDA, 2022). Like other climes, Nigeria is not left out in the utilisation of big data in policy formulation and implementation across sectors to improve governance and service delivery ( FMCIDE, 2023).

One sector that affects the totality of human existence and it is inevitable is peace (Saeedi, 2020). The peace sector is that segment of the society that manages the people's demand for peace or the people's peace needs (Suurmond, 2020; Prakash and Suurmond, 2013). A lack of stability in this sector, means there is conflict. This sector in Nigeria is obviously grappling with a lot of stability issues because of the different conflicts the nation is plagued with (Nextier, 2023). The presence of conflict in Nigeria, especially the violent ones, has negatively affected its socio-political, economic growth and development (Onoja et al, 2022). This indicates that the nation is striving for a more peaceful environment through kinetic and non-kinetic efforts, which include peace building endeavours.

Peace building efforts across conflicts in Nigeria noticeably have their complexities that undoubtedly desire

transformational contributions. According to Hassan and Ahmed (2021) any transformational endeavour in peacebuilding, strives to transform the root causes of conflicts after establishing the nature of the conflict through innovative approaches. For instance, an innovative Early Warning and Early Response system was developed in Kaduna and Katsina States, to help mitigate potential conflicts and violence by fostering local collaboration. Community stakeholders in these states were trained on early warning and response systems, and also trained to ensure that peacebuilding is approached on the basis of human rights, with gender being taken into consideration. Since its establishment in August 2023, 126 cases of potential conflicts and violence were reported, 65 in Kaduna and 61 in Katsina states, and 53 of these cases were successfully resolved within three months (UN, 2024). In addition, states within Nigeria's conflict affected areas, such as Plateau, Kaduna, and Adamawa have established peace institutions in recent years as initiatives to quell religious, ethnic, and farmer-herder conflicts as efforts to promote peacebuilding in the areas (Kew, 2021). Another handy innovative example is in Borno State, Nigeria, where young people have been trained on how to use animated pictures and illustrations to promote peacebuilding through alternative narratives ( Haruna, 2021). These are some of the recorded innovative strides in peacebuilding efforts in Nigeria. However, irrespective of the ongoing innovative strides in Peacebuilding efforts in Nigeria, much more is required to achieve a more peaceful country, especially considering the myriad of conflicts in the country that would require more vigorous and innovative efforts to transform peacebuilding in the country. Moreover, according to Njoku and Elijah (2023) the conventional approach of peacebuilding has seemingly become ineffective in containing the rise in conflicts globally. This reiterates the need for more innovative processes,

Considering the transformative power of emerging technologies and the associated components ( internet, Artificial Intelligence, ChatGPT. Big Data etc), innovations across sector are increasingly emerging as a result of leveraging these technologies and their components. For instance, Big Data has become a popular phenomenon in every sector of the society. It has become a driving force - through its ability to provide valuable insights- behind many business strategies and decision-making processes across sectors of the society (Institute Data, 2023). As the quest for enhanced and innovative peacebuilding becomes increasingly imperative, this paper examines the inherent possibilities in Big Data in respect of Peacebuilding in Nigeria. This study has the following objectives: examine areas where big data fosters peacebuilding and identify the challenges of big data for peacebuilding.

## **Literature Review**

The concept of big data can broadly be said to refer to data which is too big to be handled by the usual methods of processing data. However, the term “big data” has various definitions and is used in different contexts (Nwangwa et al, 2014). It is used with regard to high volume, high velocity, high variety data, which cannot be stored or processed by older methods of data collection, processing and analysis. According to the United Nations Global Pulse (2015), big data is conceptualized in terms of the volume or amount of data created regularly from different sources, the variety or diversity of data, and the velocity or increasing speed at which data is generated. Big data requires larger storage resources, faster and more efficient collection, processing and analysis methods than conventional data.

Big data can therefore be said to encompass new methods, tools and technologies for collecting, managing and analyzing

the vast increase in both structured and unstructured data for insightful and effective decision making (Nwangwa et al, 2015).

With the use of new technologies such as cell phones, web searches and social media posts, data is readily available and can be collected actively or passively. Active data collection involves direct and intentional participation of people, such as through the use of surveys. Passive data collection involves obtaining data from people's use of everyday technology such as phones, internet and social media posts (also known as 'data exhaust') where users are not consciously participating in data collection (Terdel, 2022).

### **Sources of big data**

The major sources of big data are:

1. **Call Data Records (CDRs)**, which is data collected by cell service providers for billing purposes. It contains information about each time a cell phone user makes or receives a voice call or an SMS. With smartphones, internet data access records are also stored, as well as location references.
2. **Internet IP address geo-tagging** provides data which monitors displacement or migration patterns via smartphone location and can be used to monitor and predict conflicts.
3. **Satellite and drone imagery** enable the collection of images and mapping of changes over time geographically. It is most useful in remote and inaccessible areas where it would be otherwise difficult to obtain data.
4. **Sensor data** can be used to monitor risk factors and monitor migration patterns.
5. **Crowdsourcing** refers to the process of bringing

people with a common purpose together to achieve their aim. In this sense, stakeholders can be brought together to contribute the required data. An example of this is the Ushahidi platform used during the 2007 Kenyan elections by citizens to report post-election violence via text messages, and the collated data was then made available to all citizens to ensure their personal safety (Terdal, I. 2020).

6. **Social media analysis** involves analyzing data obtained from social media platforms. This is most valuable in detecting potential conflicts due to increase in hate speech and misinformation. Facebook, Twitter, Instagram, Tiktok, and dating sites are examples of social media where posts can be analyzed to identify potential conflicts.
7. **Radio** is used to disseminate information, and can provide information on a local community's opinions and sentiments on potential conflicts.
8. **Image recognition** involves the use of images shared on the internet and on social media platforms to promote certain ideals which may instigate conflicts.
9. **Surveys** utilize data collected from responses to questions posed to individuals, whether online or in person.

## **Peacebuilding**

Johan Galtung is credited with the emergence of the term peacebuilding in 1975 (IAHPCR, n.d). He advocated for the formation of infrastructure to promote sustainable peace by resolving the root cause of conflict, rather than merely establishing the absence of violence.

Peacebuilding can be defined as any effort designed to prevent the eruption or return or reoccurrence of conflict through actions of national and international actors, to institutionalise

peace, which connotes the absence of conflict (IAHPCR, n.d). Peacebuilding also refers to any activities undertaken to reassemble the foundations of peace and provide something that is more than just the absence of war” (United Nations, 2010). Another meaning is that Peacebuilding is the action taken to strengthen capacity for conflict management, reduce the risk of relapsing into conflict, whilst laying the foundations for sustainable peace and development (United Nations, 2010). Peace enforcement, peacekeeping, peacemaking and peacebuilding are all approaches to peace, with peacebuilding being long-term, and involving the establishment of structures for sustainable peace.

Peacebuilding can be seen as all methodical and rational approaches geared towards determining and removing sources of conflict, reconciling parties in conflict as well as addressing or tackling perceived issues that can trigger future conflict (Adegbami, 2020). Political will, effective leadership, human and financial resources are essential elements for successful peacebuilding. Usually, peacebuilding needs in a community or nation changes over time. The UN is mandated to engage in peacebuilding, with its mandate being to maintain international peace and security, and to take measures for the prevention and removal of threats to peace.

Challenges to peacebuilding include sourcing financial resources for identified needs, human capacity building, coordinating peacebuilding responses, resolving competing needs to eliminate the root cause of disputes, and adequate communication to promote peacebuilding.

Nigeria has experienced many challenges to peace, with many violent conflicts taking place simultaneously. These conflicts are caused by socio-political, economic, religious and ethnic differences of opinion. Ethnicity, the struggle for the control of

natural resources, struggle for the creation of additional states and local government areas, land ownership, religious intolerance and youth unemployment are the major reasons for the present conflicts in Nigeria (Adegbami, A. 2020).

### **Big data and peacebuilding**

After the World War II in 1945, the sources of violent conflicts shifted from majorly conflicts between nations to conflicts within nations. Internal struggles and agitation for national sovereignty gave way to ethnic conflicts, and terrorism, which led to a resultant shift in the concept of human security. With this shift away from the usual types of war and violent conflicts, a simultaneous shift occurred in the traditional methods of analyzing data for peacebuilding, national and human security. Newer and faster methods of data analysis, analytical capacity and new types of data were developed to cope with these changes to provide real-time information (UN Global Pulse, 2018).

The Escobal et al (n.d) identified big data as a key area of interest for peacebuilding and conflict prevention

### **Areas Big data can foster peacebuilding in Nigeria**

The UN Global Pulse was established in 2009 to examine new methods of achieving the Sustainable Development Goals and the Post-2015 Development Agenda via big data and new technologies, due to the fact that the existing methods of statistics, household surveys and census data, though previously effective, are now insufficient to create instantaneous visual infographics for timely aid (UN, 2018). Big data generated by the internet and mobile phones in recent times can also be used for information for sustainable peace and development (Wählich, 2019).

Leveraging on the work of Escobal et al (n.d) where five major areas of peacebuilding big data can be applied by policymakers and other stakeholders, these areas are: Migration, Hate Speech, Perceptions of exclusion, Monitoring and evaluation, Early warning and prediction. Nigeeia can leverage Big data for peacebuilding in these same areas:

### **Migration/ Internal Displacement**

The increasing number of violent conflicts, seasonal irregularities, and the increased scarcity of resources due to climate change, economic hardship among others in some locations have caused an increasing displacement of persons, which leads to further conflict for scarce resources. An example of this is the farmer-herder conflict which occurs in Nigeria. To encourage successful peacebuilding, states and international actors utilize data from monitoring migration to collect dynamic data, especially during conflicts in insecure or inaccessible areas, for appropriate intervention. Real-time location information can be used to detect migration or displaced persons movements during or after conflict, natural disaster, for immediate action. Call Data Records, GPS smartphone tracking record, internet IP address geo-tagging records; social media analysis records and sensor data records can be used to monitor migration or displacement patterns for timely intervention and determining relevant peacebuilding activities. However, care must be taken to ensure that privacy laws are not infringed upon.

The biggest risk in implementing big data for monitoring migration or displacement of persons is that it is capable of infringing on peoples fundamental human right to privacy (Section 37 of the Constitution of the Federal Republic of Nigeria) and their rights to have their personal data safeguarded (Nigeria Data Protection Act of 2023). Thus, data must be anonymized (made anonymous), to prevent it from

being susceptible to leaks of personally-identifiable information (Isaac, 2019). Therefore, it is critical to ensure the safe and secure use of data only for peacekeeping purposes.

### **Perceptions of Exclusion/Unfairness**

Where a segment of a community or identity group considers or perceives that it is being excluded from political, economic or social opportunity or unfairly treated in national issues, it leads to the creation of tensions, and this is a likely trigger for conflict, as is the case of some of the conflicts in Nigeria: Indigenous Peoples of Biafra agitation,. The perception of unfairness, assigned identities or assigned blame of one group to another are triggers for violence in developing or growing societies (UN Global Pulse, 2018).

In Nigeria, the perception of exclusion is one of the major sources of conflicts, as no ethnic group, state or region wants to be, or appear to be marginalized by another. Big Data from various sources on perceptions of exclusion extracted, can be used to make decision on steps to take to prevent such perception from escalating to full blown conflicts if properly monitored and measured for timely intervention before it leads to violence. The major challenges for measuring perceptions are:

- It is difficult to measure a perception which does not have a physical manifestation.
- The indicators of exclusion are difficult to manage in remote areas or ongoing conflict zones.
- The expense encountered in collecting real-time data.

However, data collected from radio, social media and the internet, surveys, satellite imagery, SMS crowdsourcing, and passively collected data are very useful tools in measuring the perception of exclusion (UN GlobalPulse 2018).

## **Monitoring and Evaluation**

Monitoring and Evaluation enables peace practitioners assess how effective a program is. Big data provides access to real-time information to assess the programme for further decision making, accountability, and assessment of whether or not the desired program goals were achieved (United Nations PBSO, 2019).

Big data provides the following opportunities for M&E in peacebuilding:

- Collection of data from a wider variety of sources, having regard for data ethics, privacy and informed consent.
- Faster organization, categorization and structuring of data which would otherwise not be in a useful form.
- Creation and maintenance of larger databases with wider sources which can be easily accessed by evaluators.

These steps would provide evaluators with constant information during the project, even without having to be present constantly. More effective M&E processes with big data would improve political and financial support for peacebuilding.

## **Hate Speech**

Hate speech is typically used to promote divisiveness and violence. With technological advances, hate speech is spread even more widely with internet access and on social media platforms, to fuel violence in developing countries. Hate speech is a challenge in Nigeria (Uroko, and Obiorah, 2021).

Big data can monitor and analyze hate speech by:

- Social media scraping; using AI to automatically download and analyze available social media posts to

- identify hate speech.
- Voice recognition; the use of speech to text technology to analyze radio and other speech, measure emotions and analyze for pre-identified hate terms.
- Image recognition; to identify images such as posters, pictures, and graffiti which can be used to spread hate just like words.

## **Early Warning and Prediction**

Big data can be used to predict and forecast violence for conflict prevention in Nigeria. Conflict prediction involves forecasting months or years beforehand, while early warning systems deal with incidents which are about to happen or have already started happening. Big data provides a variety of data types for AI to identify patterns and predict possible violent conflicts. Effective Early Warning improves the successful implementation of Early Action steps taken prior to conflicts or natural hazards, improve policy making and allocation of resources for peacebuilding, thereby achieving peace building goals at a lower cost (Escobal et al, n.d).

Google's GDELT Project (<https://www.gdeltproject.org>) is an example of a free, open platform providing big data from every country in the world, providing free information on perceived exclusion and incipient violence and protests (Escobal et al, n.d).

One of the challenges of using big data to predict future events based on happenings in the past is that AI may be unable to predict future events which have no past precedence, thus requiring human synergy to correctly evaluate data with regard to cultural and environmental peculiarities. In the long run, human input to big data is required as only trained personnel may be able to interpret what the data would signify considering surrounding circumstances in each case

(Wählisch, M. 2019).

### **Challenges of Big data for peacebuilding in Nigeria**

1. The huge financial costs involved in purchasing licences, equipment, capacity building and human resources are a challenge to the usage of big data and technology. Except the government and other stakeholders, such as NGOs that are into peacebuilding can support the Big Data initiative, achieving it may be difficult without funding.
2. A large number of persons, especially in rural areas, are without access to mobile phones and internet services; are unable to utilize technology, and this limits their representation by big data, as an accurate representation of facts from their own opinions may not be possible.
3. Restrictions and limited access to technology during violent conflicts or natural disasters also impedes the collection and analysis of big data. For example, the disruption of internet services, electricity or destruction of telecommunications masts at the peak of the Boko Haram Insurgency in Borno State affected the quantity and quality of data collected and processed.
4. There also exists the challenge of keeping big data anonymous and private enough to remain within the ambit of the laws of data privacy.
5. Asides these challenges, there is the human element of seeking to fraudulently manipulate big data to accomplish selfish goals.
6. In the area of Early Warning Early Action, there exists the challenge of the tendency to over predict violent conflicts, and being unable to predict unusual or anomalous events with available data. Over prediction may lead to spending scarce financial resources to prevent a conflict which never occurs, while missed

predictions create distrust of the system's ability to accurately predict conflict.

## **Conclusion and Recommendation**

In Conclusion, big data has the potential to transform the process of collection and analysis of data required for peacebuilding, and eventually, the peacebuilding process itself. Its importance rests in its ability to provide valuable insights, enhance decision-making, and spur innovation in peacebuilding . Leveraging on big data, Nigeria will enhance its efforts and be better-positioned to thrive in an increasingly data-driven world. Utilizing big data, policymakers, practitioners and stakeholders can be empowered to intervene speedily to build lasting peace despite the challenges encountered with the use of big data.

This paper has the following recommendations:

1. That ethical and privacy frameworks in place (Section 37 of the Constitution of the Federal Republic of Nigeria, 1999, and the Nigeria Data Protection Act of 2023) to protect and safeguard the privacy of individuals and their personal data must be followed whilst collecting and using big data. This would prevent the targeting of vulnerable populations via sensitive data.
2. Building capacity supported by relevant stakeholders, such as the Federal Ministry of Communications, Innovation, and Digital Economy, NGOs/ Civil Society Organisations that are into Peacebuilding, of data analysts in peacebuilding to incorporate human ethos in data collation and usage to ensure fair and effective interventions, as artificial intelligence is not capable of evaluating data based on the peculiar surrounding circumstances in different cultures and environments.
3. Promoting data literacy among stakeholders, as

supported by relevant stakeholders, such as the Federal Ministry of Communications, Innovation, and Digital Economy, NGOs/ Civil Society Organisations that are into Peacebuilding and ensuring community engagement for local input in decision making and commitment to policies.

4. Promoting collaboration and data sharing amongst peacebuilding agencies, CSO's and international organizations to increase access to data.

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