ISSN No:-2456-2165

Biometric Technology Based Elections in Africa: The Way Forward

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Abstract:- Elections in African had been like an unsurmountable mountain for decades due to a myriad of problems bedeviling the continent. Some of the issues the continent had to contend with are inadequate infrastructural development, human capacity, relevant legislation, lack of political will, inaccessible geographical terrain etc. The introduction of Biometric Election within the continent had greatly impacted the voters' registration exercise as well as the outcome of general elections. This study examines how the technology has enhanced voters' confidence in election, curb voters' multiple registration and underage voting, increase electorate participation and explore the way forward to deepen and strengthen democracy within the continent.

Keyword:- *Africa, Biometric, Technology, Elections, Credible.*

I. INTRODUCTION

Election is a process used in filling political positions in a democratic setting. It remains the yearning of reasonable electorates that the process remains credible and that eligible candidates who will deliver are elected. Elections are basically a game of numbers. It then becomes evident that majority carries the vote though they may not be the best candidates. Elections in developing countries are mostly manual and laden with frauds and manipulations. Since the year 2000, most African countries had introduced the use of ICT in their election like the developed countries. Presently the use of biometrics is no longer new to the electorates. (Adeniyi, 2019)

In Nigeria for instance there are factors that influence the outcome of elections. Factors such as religion, ethnicity, and wealth and literacy level play significant roles in the outcome of elections. Most countries in Africa with multi ethnic, religious and cultural diversities are bedeviled with similar problems of electing the less qualified.

Voters' registration processes in the continent had been of a great challenge to the political parties. The financial, training, accountability and information privacy issues of such actions should be prudently considered. Continuous voters' registration is difficult for political parties to monitor. Updates of the electoral data base becomes an issue and in some circumstances may require new re-registration. This may be necessary to remove the deceased, relocated voters from the database. (Evrensel, 2010)

The Commonwealth (2018) did an independent assessment of elections in Zimbabwe and noted that after long day of monitoring votes, the electoral officers would count the polls. For fatigue, inadvertent errors can be committed. (Taylor, 2018)

Voting remains an integral part of every democratic election process. However, increasing voters' confidence and trust in electoral processes are significant factors that could encourage active involvement of citizens in elections. Electorates tend to participate more in an election when they have a feeling that their votes may count. Hence, electoral processes that culminates to the emergence of candidates must be adjudged free and fair, credible and acceptable. Unacceptable elections could lead to violence, protest and loss of lives. The use of biometric smart cards in Nigerian elections and electoral process will ensure credible elections, reduce cost and time and become more acceptable to both the national and international communities. (Akande , Arulogun, Ayeni, Ariyo, & Aderonke, 2020)

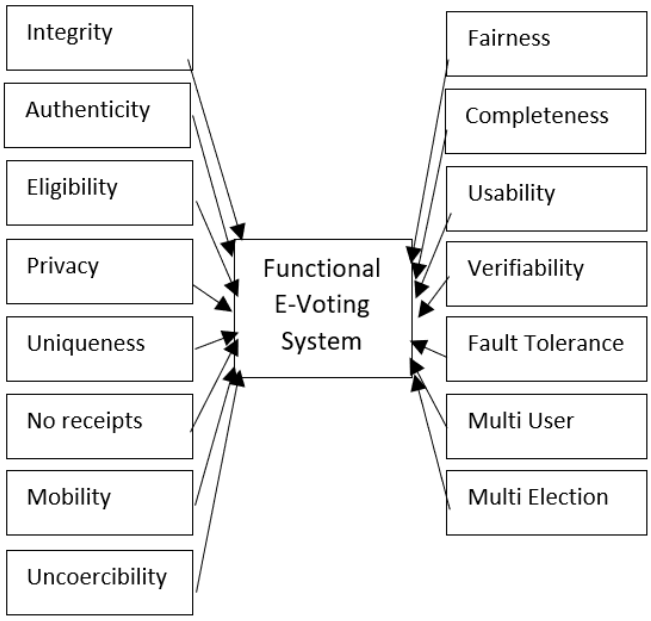

Fig 1:- Features of a Functional E-Voting System
Adapted from: (Akande , Arulogun, Ayeni, Ariyo, & Aderonke, 2020)

ISSN No:-2456-2165

II. LITERATURE REVIEWS

The introduction of multiparty systems in African democracy had made it possible for elections to be keenly contested which was not obtainable in the 1980's and 1990's. The introduction of biometrics in African elections have helped deepen democracy and improve governance in the continent. The use of ICT in the electoral process within the last decade had however increased efficiency of the process, provide new and neater ways of stealing elections. Fagbayibo et al in their paper analyzed how the judiciary are handling the increase use of technology in elections and explores the way forward in terms of progressive interpretation and proactive adjudication of election matters in Africa. It takes a technologically literate court to admit, investigate, analyses and adjudicate a technological based election. (Fagbayibo & Kaaba, 2021)

In June 2019 in Ghana, Samuel A. *et al* published their study on the experiences of voters with election technologies such as biometric systems for voters' registration and verification (BVRV) in Ghana's 2012 and 2016 elections. Using both primary and secondary data, their study discovered that the introduction of BVRV in election management in Ghana influenced the turnout both the literate and the uneducated. The study noted that institutions did not take population diversities into consideration when introducing technological involvements. This led to neglect and marginalization of some of the populace. They recommended that such inequalities in society should be considered when implementing technological interventions in elections, and enjoined other African countries with similar socioeconomic and political conditions to avoid such pitfalls. (Adams & Asante , 2019)

General Elections in most post-colonial and transitional democracies like Nigeria has not been effective in terms of reducing the incidence of voters' intimidation, stuffing and ballot box snatching, vote buying, underage voting, falsification of results etc. In 2015 general elections, Nigeria introduced a biometric card reader with the aim to make some the above mentioned malpractices unfashionable. The use of novel technology had rekindled the confidence of most Nigerians voters and international partners as well as accounted for the general drop in the volume of election petitions filed by candidates and parties. (Nwangwu, July 2015).

Nwangwu in her paper analyzed the role of biometric voting technology in improving the overall credibility of the 2015 Elections. She recommended the following:

INEC should maintain the usage of card readers in subsequent elections despite the hiccups encountered with the use of the card readers which may be associated with the challenges of change.

Accreditation should be done simultaneously with voting. There is no reason separating accreditation and voting since the card reader does not allow double accreditation.

INEC should embark on full implementation of e-voting and other technological approaches and as well work with the National Assembly to amend the electoral act (Electoral Act 2010, Section 52). (Nwangwu, July 2015)

In 2019 general elections in Senegal reveals that digitization and biometrization of electoral register did not bring an end to contested elections. Instead there was a continuity of forms litigations before and after the elections. New themes of contestation emerged. This study on the events around the 2019 Senegalese election shows how, in this case, the promise that biometrics would produce an electoral register that all electoral stakeholders could accept was not fulfilled. At best, it may be thought to have moderated electoral conflicts, but even this is very difficult to demonstrate. (Passanti, 2021)

With the rapid technological changes occurring throughout the world, it is unsurprising that one area that has recently been the focus of discussion relates to the implications of digital and mobile technologies, social media platforms, and the Internet environment on Africa's democratic process and governance.

The chapter argues that despite access to digital and disruptive mobile technologies improving governance, democratic and electoral processes, there are potential harmful effects and concerns with their use. The chapter therefore calls for better education of citizens in the use of digital technologies, as well as the establishment of strategies and policies, which will guide the use of digital and mobile technologies and social media in the political sphere. (Authur, 2020)

The deployment of a biometric technology in Ghana's 2012 election ended in confusion and the legitimacy of the outcome in danger. Analyzing data from 100 interviews and 500 surveys, it was discovered that biometric system stimulated high voter participation and confidence in the electoral process. However, the issue caused by electronic voter verification malfunction. Human error and policy manipulation by polling officials neutralized the efficacy of the biometric technology as instrument for achieving a credible election outcome. (Debrah, Effah, & Owusu-Mensah, 2019)

The discourse on the utility of e-voting in guaranteeing credible elections in Nigeria is one which will linger for a long time. There are still some factors which need to be properly evaluated before its full scale adoption. These issues still border on infrastructural capacity. Does the country have the necessary capacity to maintain e-voting technologies in such a way that guarantees its insulation from external influence or cyberattacks?

Does Nigeria have the ability to sustain e-voting technologies in rural areas where network coverage is poor? Can e-voting temper the political temperament of 'win at all cost'? These questions still need to be squarely tackled. In conclusion, it is imperative to emphasize that the introduction of e-voting as a standalone variable may not be enough to

ISSN No:-2456-2165

address election malpractice in Nigeria. There is an urgent need for consistent political reorientation. Political leaders must be ready to embrace the spirit of sportsmanship and lead a people driven campaign. (Bisong, 2019)

The use of technological devices in the electoral process has been seen as the solution to electoral fraud and manipulations in many inexperienced democracies in Africa. Lekan 2017 in his study examines the use of biometric technology in 2015 General Election in Nigeria. He opined that the technology despite some challenges contributed to the free, fair and credible election in 2015 when compared to other elections since 1999. He emphasized on voters education and rigorous training of NEC Staff on the efficient use of the card readers. (Lekan, 2017)

In South Africa about R200 million was budgeted for 2009 voter registration budget. At the end of the election some lessons were learned which include the following:

- Ensure sufficient time for registration system implementation before the preceding election.
- Look for domestic solutions that fits local circumstances
- Don't just review, implement lessons learned.
- Train, train and retrain the personnel involved.

The challenges of using biometric technology in harsh African conditions, the responsibilities of the national election management body, international donors, and other decision makers should be critically examined. (Evrensel, 2010)

The introduction of biometric voter registration and biometric voter identification on Election Day is a new trend in most African countries. This has necessitated massive political data mining. Using international standards for personal data protection from Kenya and Ghana, it was observed that Tanzania does not have a systemic regime for personal data protection. (Makulilo, 2017)

III. DISCUSSION

This study involved the deployment of questionnaire to some citizens of Nigeria to ascertain their acceptance and opinions about biometric based election within their country.

➢ *Possession of Biometric -based Cards*

The result garnered showed that over ninety percent of the respondent have a National Identity Number (NIN). Hence acknowledged that their finger print was captured during the process. The response also showed the distribution of a biometric based card or number as shown in the graph below.

Possession of Biometric-based card among respondents				
Driver's License	Voters Card	NIN	ATM	BVN
6	14	70	46	50

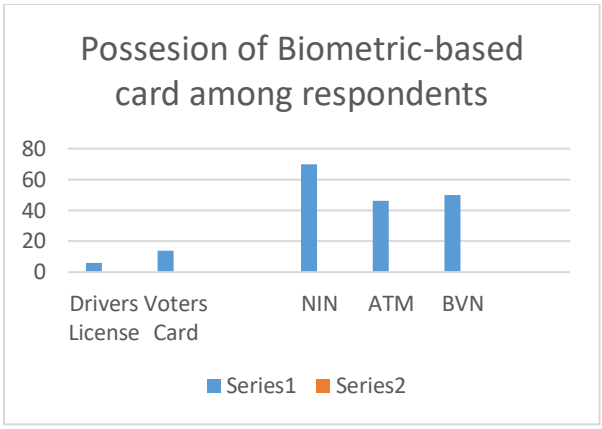

Fig. 2:- Possession of Biometric -based Cards

From the graph above the ratio of NIN to Voters Card stresses the need for voters' education and enlightenment.

➢ *Expression of confidence*

About seventy-nine percent of the respondents expressed trust and confidence in biometric technology for free, fair, and credible elections if handled with integrity.

Trust and Confidence	
YES	NO
64	12

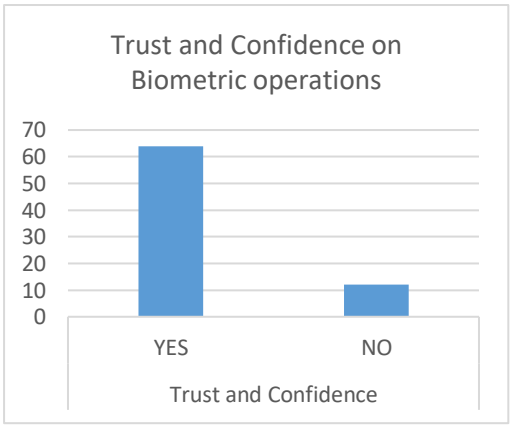

Fig 3:- Trust and Confidence on Biometric-based operations

➢ *Approval for E-voting in Nigeria*

A similar percentage approves the use of biometric technology for electronic voting. They expressed that the technology as used in developed countries delivers a generally acceptable election.

Approval for E-voting	
YES	NO
64	12

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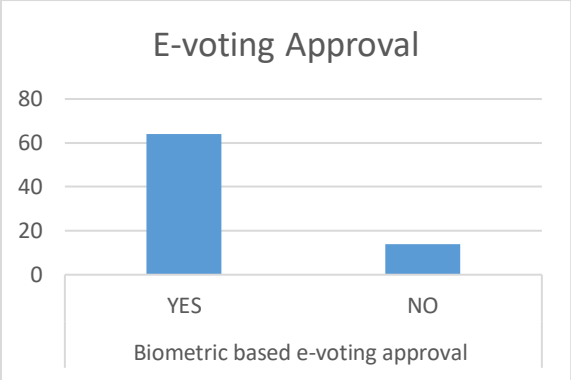

Fig. 4:- Approval of Biometric E-voting System

Technical Capabilities of Nigeria in deploying technology based elections.

This questions tends to ascertain if the country has the where withal to conduct a biometric technology based election in terms of workforce and equipment. Does the county have enough programmers, data scientists and software engineers and database auditors who could take the bull by the horn and ensure the election is hitch free?

From the graph below a greater majority agreed that the country could execute an ICT technology based elections without major problems.

Technical Capabilities of Nigeria			
Strongly Agree	Agree	Disagree	Strongly Disagree
14	40	20	4

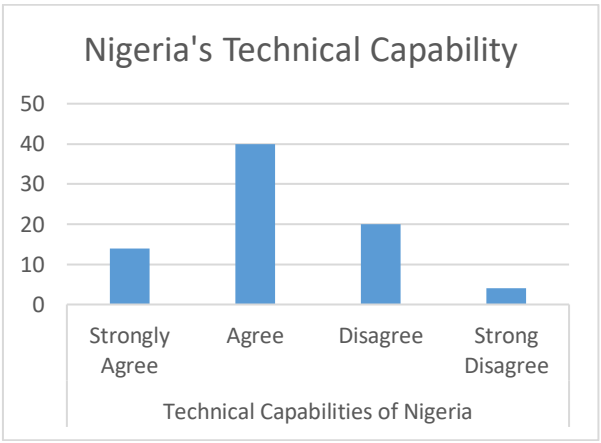

Fig. 5:- Nigeria's Technical Capability to Biometric Technology

➢ *Biometric Technology and Fraud*

Greater percentage of the respondents agree that Biometric based elections could be a panacea to fraudulent elections in the continent.

Biometrics a panacea to fraudulent election			
Strongly Agree	Agree	Disagree	Strongly Disagree
28	44	6	0

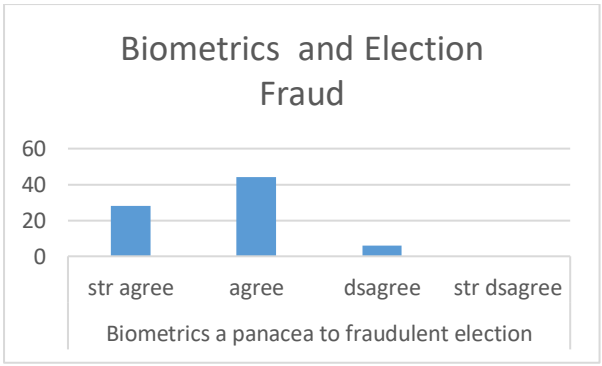

Fig. 6:- Biometric Technology a Panacea to Fraudulent Election

➢ *Consolidation of Democracy*

Consolidation of democracy is an aftermath of a series of credible elections. When elections truly reveal the wish of the people it has a resultant effect on governance. This is because the same people who voted such people could as well recall them through referendum. Politicians tends to be arrogant when they knew that the votes of the electorates do not really count.

DEMOCRACY CONSOLIDATION		
YES	NO	NOT SURE
42	6	28

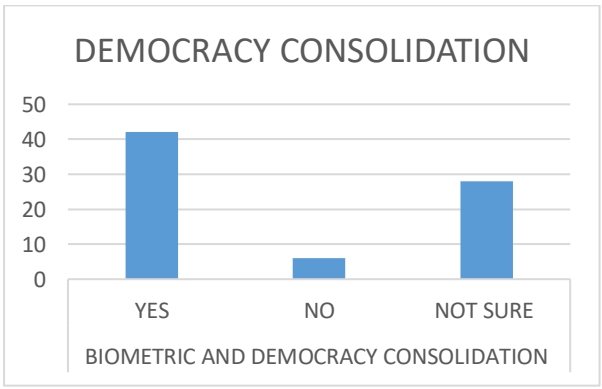

Fig. 7:- Biometric Technology in Consolidating Democracy

➢ *Cost of Biometric Based Elections*

This is an area that require a serious study on the comparative cost advantage of technology based elections in the continent. It will be ridiculous for billions of tax payers' money to be invested in election which will not be credible.

The cost of such elections should rather be invested in infrastructural development of the country.

Cost of Biometrics

COST JUSTIFICATION		
YES	NO	NOT SURE
34	20	22

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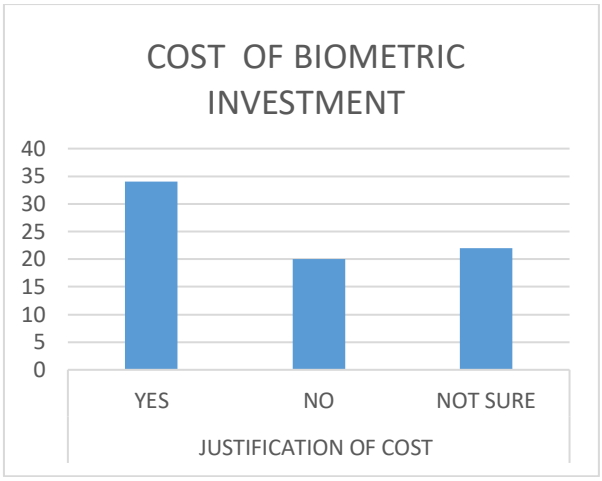

Fig. 8:- Cost Justification of Biometric Elections

➢ *Challenge to Biometric technology based elections*

The graph below shows the view of the respondents as the greatest challenge to biometric technology based election.

Greatest Challenge to Nigeria Biometric-based election				
Power	Technical Knowhow	Human Factor	Infrastructure	Foreign Influence
26	48	18	24	10

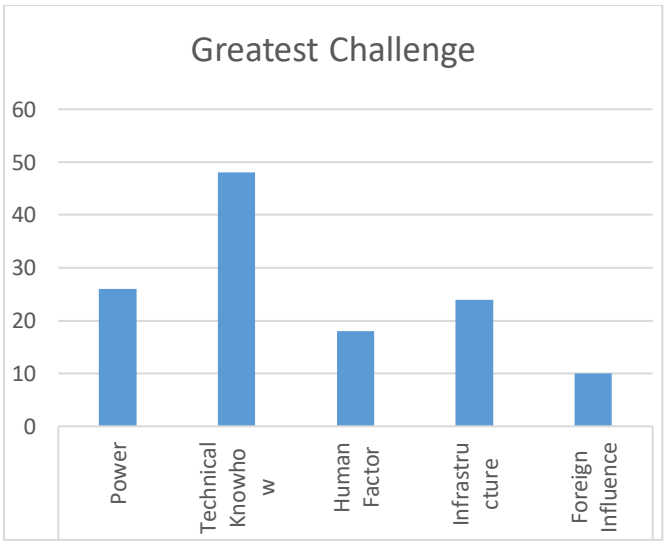

Fig. 9:- Greatest Challenge to Biometric Technology Election

➢ *General Reservation*

The table and graph below show the respondents about any general reservation about this mode of technology.

Reservation for Biometric Technology	
YES	NO
18	60

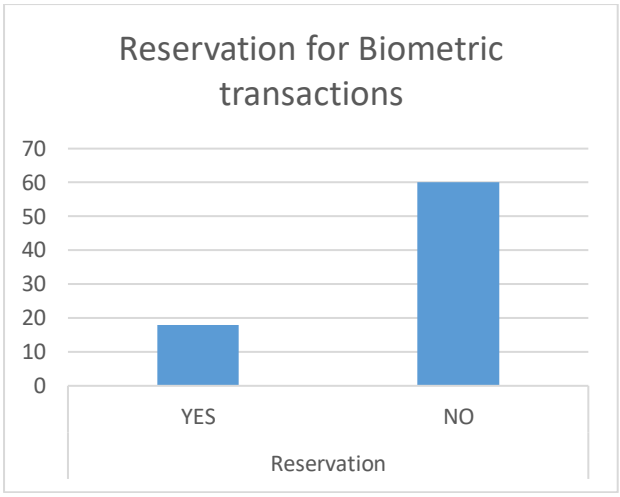

Fig. 10:- Biometric Technology a Panacea to Fraudulent Elec

IV. CONCLUSIONS

The generality of voters in the continent desire a free, fair, credible and transparent election within the continent.

The cost of biometric technology based elections in the continent should be justified. In countries where the cost of the investment would not be properly utilized, the money should be channeled to other viable developmental projects.

Foreign influence in elections in the continent could be reduced if the country has the relevant infrastructural requirements and human capital capacities.

Majority of the electorate believe that democracy could be consolidated if the technology is adequately used over a period of time.

Since majority of the electorate have National Identity Number (NIN), the card could be used as a voter's card or the data could be used to produce voters' card for the electorates. Each of the countries in the continent should consider its geographical terrain and infrastructural development before full deployment of biometric technology based elections.

The technical knowhow of the electoral umpires should not be compromised else the resultant effect of the outcome of the election will put the country in a state of mess.

The ruling government should formulate necessary legislations and exhibit political will to ensure that democratic elections in the continent gains international nod and approval.

Biometric technology based election is the way forward to ensure free, fair and credible general elections in the continent.

RECOMMENDATIONS

Voter education should be intensified to reduce voters' apathy during elections.

Civic education should be inculcated into the syllabus of education in the continent.

REFERENCES

[1]. Adams, S., & Asante , W. (2019). Biometric election technology, voter experience and turnout in Ghana. *Sabinet African Journals*, 45-68.
[2]. Adeniyi, A. (2019). Conducting Free and Fair Elections in Africa through Biometrics. *World Journal of Innovative Research (WJIR)*, 52-53.
[3]. Akande , N. O., Arulogun, T. O., Ayeni, T. P., Ariyo, A. A., & Aderonke, K. A. (2020). Exploring the Use of Biometric Smart Cards for Voters' Accreditation:A Case Study of Nigeria Electoral Process. *International Journal on Advanced Science Engineering and Information Technology Vol. 10 No. 1*.
[4]. Authur, P. (2020). *Disruptive Technologies, Democracy, Governance and National Elections in Africa.* Nice, France: Palgrave Macmillan.
[5]. Bisong, D. B. (2019). E-VOTING, A PANACEA FOR CREDIBLE ELECTION IN NIGERIA. *International Journal of Recent Advances in Multidisciplinary Research, Vol. 06, Issue 12,*, pp. 5391-5396,.
[6]. Debrah, E., Effah, J., & Owusu-Mensah, I. (2019). Does the use of a biometric system guarantee an acceptable election's outcome? Evidence from Ghana's 2012 election. *African Studies, Vol. 78, Issue 3*, 347-369.
[7]. Evrensel, A. (2010). *Voters Registration in Africa, A Comparative Analysis.* South Africa: EISA.
[8]. Fagbayibo, B., & Kaaba, O. (2021, December 01). Adhidicating Presidential Election Dispute in Africa: The Emerging Challenge of Election Technology. *Sabinet African Journals, Vol. 36 No. 1*, pp 21.
[9]. Lekan, A. F. (2017). The Use of Biometric Technology in the Success of the 2015 General Elections in Nigeria. *Sabinet Arrican Journal, Vol 36, No.2*.
[10]. Makulilo, A. (2017). Rebooting democracy? Political data mining and biometric voter registration in Africa. *Information & Communications Technology Law, Tayklor Francis* , 198-212.
[11]. Nwangwu, C. (July 2015). Biometric Voting Technology and the 2015 General Elections in Nigeria. *The Electoral Institute*.
[12]. Passanti, C. (2021). Contesting the electoral register during the 2019 elections in Senegal. Why Allegations of Fraud Did not End with Introduction of Biometrics. *HAL Open Science*, 524 -525.
[13]. Taylor, C. (2018). *Shared security, shared election: Bet practices for the prevention of electoral violence.* afsc. org/electoral violence report.