STATISTICAL ANALYSIS OF VOTING TRENDS IN NIGERIA GENERAL ELECTIONS (1999 TO 2019)

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CERTIFICATION

This is to certify that this project work “Statistical Analysis of Voting Trends in Nigeria General Elections (1999 to 2019)” was carried out by ABASS, JOEL OLUWADAMILARE with matric number 170806005 under the supervision of DR M.I AKINYEMI in partial fulfilment of Bachelor of Science in Statistics, Department of Statistics, Faculty of Science, University of Lagos, Akoka-Yaba, Lagos.

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DEDICATION

This project is specially dedicated to almighty God (Alpha and Omega) for his Grace, mercies, help and strength upon my life and giving me wisdom, knowledge and understanding in making this program a success, also my parents Mr. and Mrs. Abass.

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ABSTRACT

The influence of electorates is immeasurable, the availability of electorates at the polls during elections are dependent on many factors such as trust in the electoral body, secured polling area, belief in democracy, freedom to exercise one's franchise, antecedents of political parties, personalities of those vying for position etc. This paper aims to identify patterns in the presidential election data over the years and also model the election voter count using 2 generalized linear models (Poisson and Negative Binomial models). A consistent decline in the election votes was observed from 2003-2019, this definitely is followed on the wake of a sharp increase between 1999 and 2003. A shift in highest vote count location was also observed. Furthermore, the Negative Binomial model was selected as the model with the better fit.

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CHAPTER 1

INTRODUCTION

1.0 Background of Study

An election is a process for candidates of a political party recognized by a country's constitution to contest for a seat of power which will be decided through voting by electorates. In Nigeria, it entails so many activities such as registration for voters' cards, voters' education, collection of voter cards in local government, voters' participation (voting on election day), campaigns, etc. it happens at intervals mostly quadrennial in many countries all over the world.

Nigerians are elected to three tiers of government (federal, state, and local government) while the constitution allows for elections into two of three arms of government (executive and legislature are voted for while who heads the judiciary is decided by the executive and legislature).

The election has been around since 508BC in the world but started in early 1920 in Nigeria, many regions and units have been conducting elections before independence. The Electoral Commission of Nigeria (ECN) conducted the first general elections that cut across the country in 1959. Then the next election in 1964 was conducted by the federal electoral commission (FEC). Another electoral body was formed called the federal electoral commission (FEDECO), the same name as the former but different abbreviation, they conducted the 1978 and 1983 elections in Nigeria. The national electoral commission conducted the 1993 elections and was dissolved in 1995 to create a way for a new electoral body called the National electoral commission of Nigeria (NECON), they conducted elections between 1995 to 1998 but the body was dissolved, and independent national electoral commission (INEC) was established, and this body has conducted all elections so far from 1999-2019. (Wikipedia, 2022)

We have had 6 series of elections so far in Nigeria and when the population of the country and the number of registered voters is compared, the country still has a long way to go. Also, when you compare the number of registered voters to the number of accredited voters, the citizens do not have trust in the process and the democratic system seems to be dwindling when we compare those that vote and decide who leads the country with those that registered for the election but did not come to the pollen booth on the election day.

1.1 Fourth Republic Elections

Elections in the fourth republic started in 1999 and Nigeria have not had any change in form of government since then.

1.1.1 1999 Elections

The 1999 election was the first in the fourth republic, the presidential election took place on the 27th of February, 1999. Three political parties registered to take part in the election, the people's democratic party (PDP), Alliance for Democracy (AD), and the All people's party (APP) but when the elections got closer, the APP and AD formed a coalition to oust PDP. The candidate of the AD-APP was Olu Falae and his running mate was Umaru Shikanfi while the candidate of the PDP was Olusegun Obasanjo and his running mate was Atiku Abubakar. Olusegun Obasanjo of the People Democratic Party polled a total vote of 18,738,154 while his opponent pulled a total vote of 11,110,287. The total invalid votes were 431,611. This brings the total votes cast both valid and invalid to 30,280,052. (Africanelections, 1999)

1.1.2 2003 Elections

The 2003 presidential election was held on the 19th of April, 2003. Twenty (20) different political parties participated in the elections. The top three parties were the People's Democratic Party (PDP), the All Nigeria people's party (ANNP), and the All progressive grand

alliance (APGA). The candidate of the PDP was Olusegun Obasanjo. His running mate was Atiku Abubakar. The candidate of the All Nigeria people's party was Mohammed Buhari and his running mate was Chuba Okadigbo and the candidate of the APGA was Chukwuemeka Odumegwu Ojukwu and his running mate was Bayero. The PDP won the election with 24,456,140 total votes, the ANNP came second with 12,710,022 total votes while APGA came third with 1,297,445 total votes. The total valid votes were 39,480,489 and the total invalid votes were 2,538,246. Which brings the total vote cast to 42,018,735. (Africanelections, 2003)

1.1.3 2007 Elections

By 2007, all elected government official have served their two (2) terms in office and there was a need to handover to another government. It was regarded as the worst of all elections due to rigging, electoral malpractices, and violence that disrupt the electoral process. There was no official result for the election from the electoral body (INEC). The electoral body only estimated the result and no state result for the presidential election was released. The total valid votes for the election was 35,397,517, twenty-five (25) political parties contested for the presidential seat in 2007. The people's democratic party (PDP) whose candidate was Umaru Musa Yaradua and running mate was Goodluck Ebele Jonathan, won the election with 24,638,063 votes and the second position was ALL Nigeria people's party (ANPP) whose candidate was Mohammed Buhari and his running mate was Edwin Ume Ezeoke, they got 6,605,299 votes while the third position was Action Congress (AC) whose candidate was Atiku Abubakar and running mate was Ben Obi, they got 2,637,848 votes. (Africanelections, 2007)

1.1.4 2011 Elections

This was the fourth general election in the fourth republic, it was held on the 16th of April, 2011. Twenty (20) political parties participated. The winner was the People's Democratic Party

(PDP) whose candidate was Goodluck Ebele Jonathan and whose running mate was Namadi Sambo, they got 22,495,187 votes. The second position was congress for progressive change (CPC), whose candidate was Mohammed Buhari and whose running mate was Tunde Bakare, they got 12,214,853 votes. And the third position was the Action Congress of Nigeria whose candidate was Nuhu Ribadu and whose running mate was Fola Adeola, they got 2,079,151 votes. The total valid votes were 38,209,978 and the invalid votes were 1,259,506. The total vote cast for the presidential election was 39,469,484. (INEC, 2011)

1.1.5 2015 Elections

This election was the first election to be conducted on two different days, the 28th and 29th of March, 2015. Fourteen (14) political parties participated in the election. The winner was the All Progressive Congress (APC) whose candidate was Mohammed Buhari and whose running mate was Yemi Osinbajo, they got 15,424,921 votes. The second position was the People's Democratic Party (PDP) whose candidate was Goodluck Ebele Jonathan and whose running mate was Namadi Sambo, they got 12,853,162 votes. The third position was the African people's alliance (APA) whose candidate was Adebayo Ayeni and his running mate was Anthony Ologbosere, they got 53,537 votes. The total valid vote for the election was 28,587,564 while the invalid votes were 844,519. The total votes cast for the election was 29,432,083. (INEC, 2015)

1.1.6 2019 Elections

This is the most recent election which was held on the 23rd of February 2019. 73 political parties contested in the election. The winner was the All progressive congress (APC) whose candidate was Mohammed Buhari and whose running mate was Yemi Osinbajo, they got 15,191,847 votes. The second position was the People's Democratic Party (PDP) whose

candidate was Atiku Abubakar and whose running mate was Peter Obi, they got 11,262,978 votes. The third position was the people's coalition party (PCP) whose candidate was Felix Nicolas whose running mate was Ado Baba, they got 110,196 votes. The valid votes were 27,324,583 while the invalid votes were 1,289,607. Total vote cast for the election was 28,614,190 (INEC, 2019)

The table below shows the years of elections so far in Nigeria's fourth republic, the number of registered voters, the total number of votes cast (valid and invalid votes), and the percentage of the total votes and the registered voters. (INEC, 2020)

YEARS	**REGISTERED VOTERS**	**TOTAL VOTES (VALID AND INVALID)**	**PERCENTAGE**
1999	57,938,945	30,280,052	52.3%
2003	60,823,022	42,018,735	69.1%
2007	61,567,036	35,397,517	57.5%
2011	73,528,040	39,469,484	53.7%
2015	67,422,005	29,432,083	43.7%
2019	82,344,107	28,614,190	34.8%

Table 1.1: Election Year Result from 1999 to 2019.

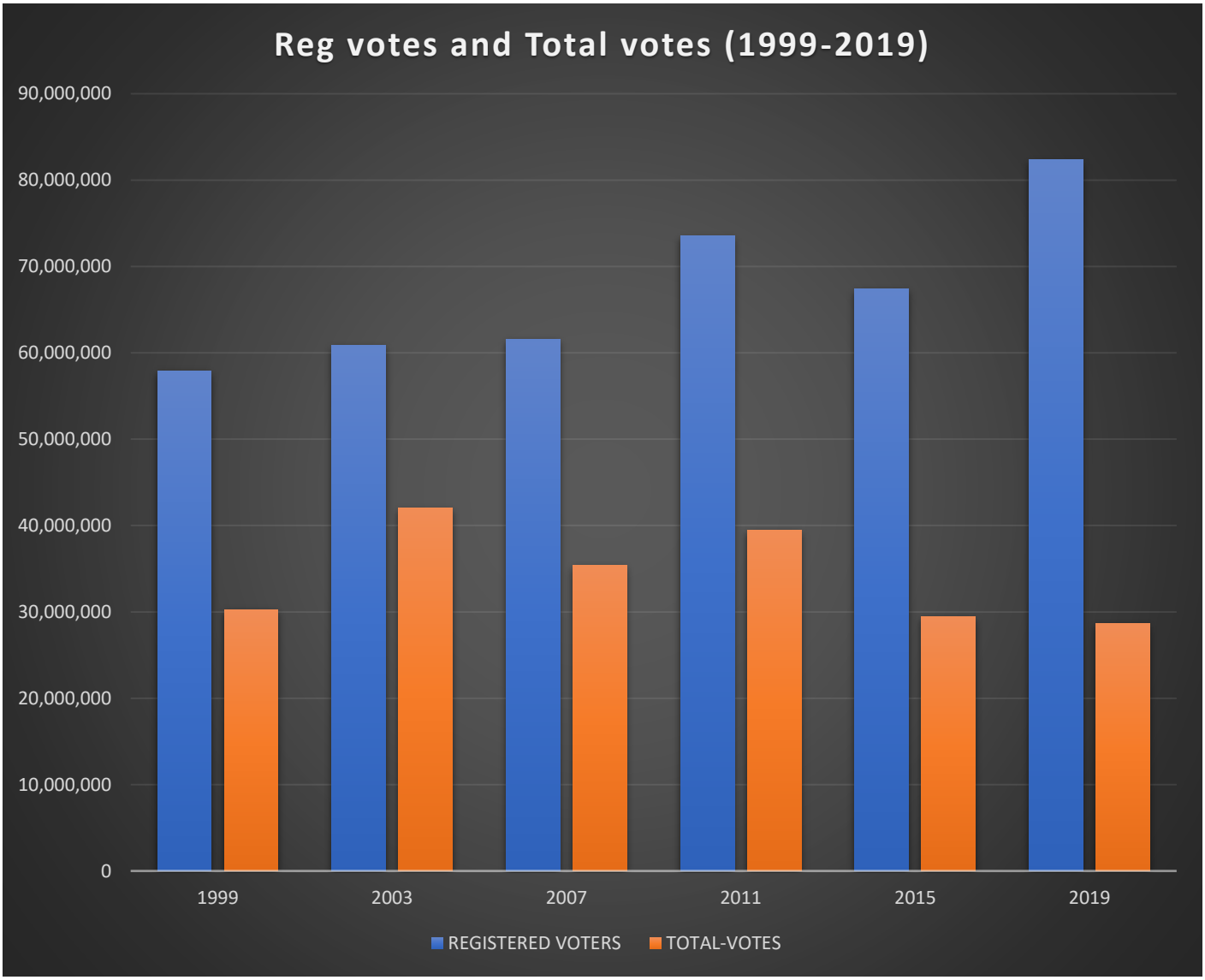

Fig 1.1: Visualization of Election Year Result from 1999 to 2019.

The chart above shows the relationship between the registered voters and total votes. The difference between the variables do shows that the people do not trust the process, a lot of factors have accumulated over the years and led to voter's apathy on elections day. The number of registered voters increased from 1999 to 2011 then it reduced in 2015, and went all high in 2019. Number of total votes increased in 2003 and went a bit low in 2007 then high again in 2011 and since then it has been on the low.

1.2 Statement of Problem

Nigeria got its independence in 1960, so far, we have had many elections, but the fourth republic has been steady since 1999. General elections have taken place six times in this republic and there is no improvement in the number of turnout when population and registered voters are compared. It is believed that the reasons are enormous, some of which are violence and insurgencies in some parts of the country, political party propaganda and lies, poverty and corruption index, exchange rate, unemployment, lack of improvement in the road network, policy summersault by the government, etc. The problem here is why do we keep having low turnout in general elections? Of all elections in Nigeria's fourth republic, the 2003 elections experienced the highest turnout when total votes are compared with registered voters.

1.3 Aims and Objectives

The general objective of this work is to highlight the participation of people i.e., the turnout of voters in general elections.

1. The work intends to show the contribution of states to the determination of the winners of presidential elections in Nigeria since 1999 till date.
2. To determine how geopolitical zones have influenced so far who seat as the president of the country.
3. To visualize voter's turnout by electorates in elections from 1999 to 2019.
4. Poisson and negative binomial model will be compared in order to see which best fit the voting trend in 2019.

1.4 Scope of Research

This research work shall discuss the effects of low turnout on the winner of the presidential election, it will discuss how low participation in elections by electorates has affected the growth of the country due to lack of good and competent leaders who have mounted the presidential seat of power so far. How states and geopolitical zones have fared in determining who takes the seat of power is also a factor to consider before the next election so that it can be a success.

1.5 Limitations of Study

The study experienced shortfalls such as

i. Inability to get all data needed from one known source (INEC).
ii. Election Result for states in 2007 general elections was not available.
iii. In some cases, valid votes were used instead of total votes in the analysis because total votes were not available.
iv. The data provided by INEC was not computed properly

1.6 Research Questions

i. Why do we have low turnouts in general elections?
ii. Why do subsequent elections seem not to be improving in terms of turnouts?
iii. What can be done to improve turnout in the next election?
iv. What have states and geopolitical zones contributed to who becomes the president of the country?

1.7 Definition of Terms

In this section, I will be defining terms that will be used or seen in this project

i. Analysis: detailed examination or breaking down of something into parts
ii. Candidate: a person representing a political party or nominated for election
iii. Constitution: a basic principle and laws of a nation/state
iv. EDA: exploratory data analysis is an analysis of datasets to summarize their main characteristics using graphics or chart
v. Election: it is an act or process of exercising one's right to vote for candidates of one's choice
vi. Executive: this is an arm of government whose job is to execute law e.g., the president, governor, police, etc.
vii. Fourth republic: republic is the change of system of government e.g., from military to civilian and vice versa. The first republic was 1963, the second republic was 1979, the third republic was 1993 and the present republic which is the fourth republic has been in existence since 1999.
viii. Geopolitical zone: we have six zones in Nigeria, they are northwest, northeast, north-central (middle belt), south-south, southeast, southwest.
ix. Government: a group of people vested with power and authority by the constitution to lead people.
x. INEC: independent national electoral commission is a body empowered by law to conduct elections in Nigeria.
xi. Invalid votes: these are votes that were cast wrongfully in an election
xii. Judiciary: this is an arm of government empowered to interpret laws e.g., judges in a law court

xiii. Legislature: this is an arm of government empowered to make laws e.g., the national assembly which comprises of senators in the Senate (upper chamber) and honorable in the house of representatives (lower chamber)

xiv. Political party: this is a group of people with a common goal and objectives to get hold of power in a democratic system of government.

xv. Presidential: this is a system of government in which the president is the head of government.

xvi. Registered voters: these are people whose names are registered with INEC and can vote in an election

xvii. States: states are sub-regions in a country headed by a governor e.g., Lagos, Gombe, Kano, etc.

xviii. Statistical: these are measures relating to statistics (collecting, presenting, analyzing, and interpreting of data)

xix. Total votes: these are the sum of all votes cast in an election, it comprises both valid and invalid votes.

xx. Trend: a pattern or direction or trajectory which a thing follows

xxi. Valid voters: these are votes cast properly on an election day.

xxii. Voters: these are people who have the right to vote on an election day, people less than 18 years old cannot vote.

1.8 Outline of The Project

This research study would be organized into five chapters, what each chapter will be based on is discussed below.

Chapter one is also called the introduction and it contains the background of study, aim, and objectives, statement of problem, scope of research, limitation of study, research questions, the definition of terms, and outline of the chapters. Chapter two will be reviewing at least 25 journal articles, convections, reports, websites, and materials related to this project topic. Topics that cut across all factors that could be responsible for the low turnout of voters. Reading through materials, summarizing them all, and paraphrasing them based on my understanding of the subject matter. Chapter three will discuss methods used by the project student/researcher to generate or gather data and how the analysis be done. i.e., this is where questions like what data to collect or ignore, who and where to collect it from (sampling design), how to collect the data (data collection method), and how to analyze (data analysis method). I will be creating a model using Poisson or negative binomial. Chapter four will cover a lot of exploratory analysis of data collected and insights into the data. It will show a comparison of states, geopolitical zones, parties, and personalities in each election so far. Chapter five contains an overall summary of all that has been done in the project, conclusions, recommendations, glossary, bibliography, and appendix.

CHAPTER 2

LITERATURE REVIEW

2.0 Conceptual Review

Having an election in a democratic setting requires a lot of work to be done by the government in power, the governed, and the umpire (electoral body). The government in power disburses funds, creates enabling environment, and give the umpire free hand to operate, the governed participate in elections by using their voter's cards to elect candidates of their choice and the umpire issue voters' cards to the electorate, set dates for elections, educate voters and create awareness via all media platforms. Reasons why there exist variations in voters' turnout in elections in this country are numerous, some of which are as a result of lack of trust for the government, propaganda, and lies portrayed by the government when they seek power, violence during elections, candidates without clear agendas, religious and ethnic dichotomy, policy summersaults by successive governments, etc.

Reasons for varying statistics when comparison of registered voters and accredited voters is done in elections so far is a major cause for alarm. Many political enthusiasts, policymakers, political analysts, and commentators have pondered on so many factors, some have proffered solutions, yet the numbers are not encouraging in successive elections.

Works of literature and theoretical framework of related topics from all wide, journals, reports, and articles are summarized below.

2.1 INEC Involvements in Election

The electoral process needs to be seen as free and fair in other to allow many to come out to vote on Election Day, an election that meets world best practices and is seen to be free to all by all standards. When voters are not under duress or compulsion and threatened, many more

voters might not come out to vote and this will reduce turnout (Amaechi, 2019) Many countries in the world are improving on their electoral practices to conform to world standards. Nigeria needs to also add voting by diaspora to its electoral reform so that those outside the shores of the country can be integrated into the system, engage in the process of selection of leaders, and partake in decision making that affects the country. Also, they can support the government in their best possible ways most especially raising funds for projects and increasing revenue for the government. Diasporic will increase voting outcomes due to the population of Nigerians outside Nigeria. Nigerians living outside Nigeria should not be disenfranchised of their civil right (Ayo, 2012) The electoral body in Nigeria is not fully independent, they are still influenced by powers in government and notable politicians also international interests against the will of most Nigerians. these causes distrust and lack of belief in the system which later shows in the turnout during elections, it could cause instability and underdevelopment. (Omotola, 2010) A new trend of accreditation and voting simultaneously is a welcome development by INEC unlike when people will have to come first for accreditation then come afterward for voting, many do not go back to vote, adding that to the low voter turnout in the system already. (Isiaka,Hakeem,Ibrahim,Hassan,Kolawole and Latifat , 2021) The democratic system in Nigeria is under threat if with the great population the country boost of, she cannot reflect that in her electoral process. Many of the causes are from those in charge of the electoral process (INEC). The way political parties also handle their campaigns and engage with electorates calls for concern. Electorates trust less the value chain of Nigeria's electoral process. (Fagunwa, 2015) Funds are pivotal to any organization's smooth and efficient running. The electoral body is not properly funded, and it undermines its effectiveness. Their independence and autonomy to administer credible elections is under threat and will not be accepted by most Nigerians. This causes their overreliance on the executive who uses such avenues to clamp down on their independence. Also, the legislative need to make laws to allow

the electoral body to become independent and autonomous (Ajayi, 2007) Voter registration must be seen to be seemingly free and fair; the electoral body should make registration easy and close to the masses so that they can easily get their cards and prepare for the election. A bad registration process will hinder turnout and low turnout causes imbalance electoral result (Onah,El and Anifowose, 2013)

2.2 Civil Society and Education of the Electorates

Participating in elections has gone beyond voting on election day only, people will need to engage in campaigns, educating and sensitizing the less educated and underprivileged in their society not to engage in any vices during elections such as selling of votes, violence, or sitting at home on election day due to lack of hope for a better country (Okoro,Mike Alumona,Nnanyelugoa and Nwafor, 2013) Voting should be made compulsory for everyone above the age of 18, measures should be put in place to ensure smooth registration and collection of voting cards. All civil servants without voters' cards should be queried and sacked if need to be to serve as a deterrent to others. All contractors should possess voting cards, the government should ensure some benefits aren't gotten unless voters' card is tendered. This might not push everyone to vote but will increase the voting turnout. (Agu,Sylvia Uchenna,Okeke,Vincent Sunday,Adeline and Idike, 2013) International bodies such as the African Union(AU), European Union(EU), International Foundation for election systems (IFES), National Democratic Institute for International Affairs (NDI), and the International Republican Institute (IRI) helps to improve elections as observers and ensuring transparencies in elections to build trust and appetite for voting amidst electorates, educate electorates and serve as election observers at the polls. (.I.Rotberg, 2007) In 2015, we had a lot of participants in the general elections, many students partook in the election even youth that just clocked 18 years. The younger generation flooded the poll to change the pattern of governance devoid of corruption and insecurity. The turnout was huge because the anticipation was high. People

wanted a change in government, and they got it. (Ibrahim,Sheriff Ghali,Liman,Abdullahi Nuhu, Mato and Kabir, 2015) Votes do not count is so common among Nigerians and it affects voters' turnout on election day. It's one big factor of voter apathy in Nigeria. As much as we need to work on persuading the people to vote through improving all electoral laws and reforms policies to conform to world best practices, we also need to give incentives to people, and it must be institutionalized. (Omoregie,Bethel,Edoba B and Ihugba, 2019) Elections are instrumental in the coercion and togetherness of the country; an imbalanced election can cause chaos and unrest in the country. Tribes, regions, or religion that feels marginalized might start protest which could lead to violence in some parts of the country and degenerate into insurgency or cry for balkanization (Araba,Akeem,Joseph and Braimah, 2015) Nigerians do not look at issue-based campaigns but are attuned to personality. They are accustomed to the personality involved rather than base their decision to vote on capacity, competency, and capability (Afolabi, 2018) There is no area in Nigeria without people who understand the nook and crannies of the area, such people should be used alongside security agencies to ensure smooth, free, and fair elections. In any area where violence erupts, the result in such areas should not be counted. These will serve as a deterrent to all those that want to act in such a way in other areas. People will have to take the security of their area/ pollen unit secured (Ohazurike, 2020).

2.3 Effect of Media on Elections

The general belief is that political positions are too juicy, and it makes politicians use all means to get to power because of what they stand to gain. Many politicians also give false hope through the magnificent projects they plan to achieve in their manifesto which is not realistic. Also, those seeking political positions should be mandated to come for debates so that electorates can know those who want to lead, question them, and know the capacity of those aspiring to be their leader. (Nwankwo,Okafor,Asuoha,Cletus and Godwin, 2017) Social media

served as a tool of massive participation for a particular party and the reverse for the other party in 2015, the ruling party then was on the wrong side on the media, many conversations about their incompetency and how they need to give way for the party with the change mantra ensured that more Nigerians came out to engage on the media as well go to the polls to finish the job by voting out the incumbent (Saheed, 2015) Propaganda and lies by politicians and their political parties have reduced voters' turnout over the years. People no longer trust those seeking power because they make gigantic promises they might not fulfill. They should be singular in their promises, and it should be fundamental so that it appeals to voters. (Bello and Mattew, 2020) The introduction of technology to our electoral system will increase voters' appetite to vote thereby increasing turnout during elections. Nigerians are well present on social media and many youths will vote on election day if the means or method of voting is seemingly easy with help of technology or possibly totally online. (Nwangwu, 2015)

2.4 Security Agency's Duties in an Election

Politicians use thugs on several occasions during years of politicking and elections, majorly during campaigns, election day, and against opponents. The use of thugs by those seeking power has led to low turnout at elections, the people lost hope in the security agencies because they act as an accomplice to these thugs. The police force should be well enumerated and compensated so that they can do their job diligently in protecting the lives and property of the people. (Adeleke, 2016) It is believed that before elections, politicians connive with hoodlums, conflict enthusiasts to disrupt polls if it seems the result will not favor them. After so many findings it was discovered that there are two angles to this it either pushes the populace to vote more or hinders participation and reduces turnout. It depends on the context the violence is viewed by the electorates. It has been discovered that not all violence or disturbed environment means voting will not take place or voters will not turn up but it depends on the context at which the electorates in the disturbed area view the violence, it could be for the right cause and

they might feel they need to go all out to support the course and it might be against them and they feel they need to leave the vicinity or hide in their abodes on election day. (Dorina A.Bekoe and Stephanie M.Burchard , 2019)

2.5 Effect of Political Party Affairs in Elections

Gender imbalance in electoral process such as maligning the female folks by disenfranchising them of their civil rights, parties not giving a right percentage of positions for the female gender causes low turnout at the poll. Also, equal opportunities should be given to both genders, no gender should be marginalized, and no gender should be discriminated against. (Charles, Mike Alumona, Iloh Emeka and Ikenna, 2009) Politicians have monetized the polity, people are driven by how much they get but not party campaign promises or manifestos, all people are interested in how much incentives they can get from politicians to solve their present needs. Those seeking political positions use the money to induce people since many are financially challenged. It is becoming a money bag politics (Adeleke G. F., 2016) Nigerians vote based on the campaigns a party brought to the fore which convinces them that the party they support is better than the rest. Also, Nigerians look at what they stand to gain if they vote for a particular candidate, they consider his or her antecedents and decide at the poll, lastly, they consider where the person comes from(ethnic), religion, background, and political inclination e.g., elite, middle class or lower class. (Mahmud, 2015) Politicians rely so much on judicial pronouncement when elections are close, they are back and forth of judiciary proceedings by party members and the faithful's when their will is not in term with the party heads which brings about going to court as much as their human right will permit is affecting the politicking thereby reducing turnout. People consider inter-party relations and if it is engrossed with too much animosity, people tend to look away and see no reason to vote since those expected to lead them cannot solve their internal party problems. (Andza,Saa-aondo Moses, Akuva and Isaac Iorhen, 2019) All political parties in Nigeria have members, in an election not only your

members will give you the total vote you need to win an election but over the years, research shows that many results from the polls do not reflect the presence of membership since the total number of votes accumulated may be lesser than the total number of party members in a particular area. (Waheed, 2020) Political parties should act out their purpose in electoral systems, help screen out incompetent candidates from the primaries, field the best candidates at the poll and act as good opposition when they are not in power. Also, present sound and realistic manifestos. (Ambi, 2014)

CHAPTER 3

METHODOLOGY

3.0 Introduction

This chapter contains the method of data collection, software used in the projects and methods used in performing descriptive analysis on the data, visualization method and models explored.

3.1 Data Collection

Data used for this project are from secondary sources. The data of the 1999 elections were gotten from the African elections database and international foundation for election systems (IFES, 1999). The details of the 2003 elections were gotten from African elections database and electoral geography (Kireev, 2003). Election held in 2007 but there was no official result by INEC on total votes cast by state because it was full of irregularities, rigging, violence, and other vices. There is a personality and party result available but it is not needed for the project. The data of 2011 election per state result were gotten from an archive uploaded by INEC. There were issues with the result, on INEC archive when all the states were added, it gave 38199219 but it was officially declared as 39469484. The error was from the addition of all the votes, a mistake on INEC's part (INEC, 2011). The state by state result for 2015 was gotten from INEC portal (INEC, 2015). The state by state result for 2019 was gotten from INEC (INEC, 2019).

3.2 Software

Microsoft Excel and R programming language was used in this project for analysis. Excel is a spreadsheet program created by Microsoft and it is uses worksheet to store, organize and track data sets with formula and functions. In this project, Excel was used for collection and collation of data i.e. states in Nigeria, election results in each state in 1999,2003,2011,2015 and 2019.

R is a programming language used for statistical computing and graphical representation. It was created by Ross Ihaka and Robert Gentleman. In this project, R was used to create charts of election results by state, perform basic statistics, likelihood test and run models.

3.3 Descriptive Statistics

Descriptive analysis is used to describe or summarize the characteristics of a sample or data set. It includes measures of frequency, measure of central tendency, measure of dispersion and measure of position.

We checked for measure of central tendencies, measure of variability, skewness and kurtosis. The command view helps to present the data in tables but for better understanding we need to calculate some descriptive statistics and visualize our data.

Measure of central tendency tells about the average or middle value of the data. It comprises of the mean, median and mode

Mean is the average of the given numbers and is calculated by dividing the sum of given numbers by the total number of numbers. I added all the votes of all the states in an election year and divided it by number of states involved. (Byju's, 2021)

$$mean = \frac{sum\ of\ all\ the\ observations}{total\ number\ of\ observations}$$

$$\bar{X} = \frac{\sum X}{n} = \frac{x_1 + x_2 + \cdots x_n}{n} \qquad (1)$$

Median is the middle number in a data set when the numbers are listed in their ascending or descending order. It is also known as the second quartile Q_2. (Byju's, 2021)

$$median = (\frac{n+1}{2})^{th}\ observation \qquad (2)$$

Range is a numerical indication of the span of our dataset, it is calculated by subtracting the minimum value from the maximum value in a dataset. The minimum value is the lowest vote

from all the states in a particular election year while the maximum value is the highest vote from all the states in a particular election year. (NEDARC, 2019)

$$RANGE = MAX - MIN \qquad (3)$$

Quartiles divides datasets into four quarters. It arranges the datasets in arranging or descending order then divides them into four equal parts. We have first quartile, second quartile, third quartile and the interquartile. The first quartile is also known as the lower quartile, it separates 25% of data from the highest 75%. The second quartile is also known as the median, it divides numbers into two equal parts. The third quartile also known as the upper quartile; it separates the highest 25% of the data from the lowest 75%. (Toppr, 2020)

$$first\ quartile = Q_1 = (\frac{n+1}{4})^{th} \qquad (4)$$

$$second\ quartile = Q_2 = (\frac{n+1}{2})^{th} \qquad (5)$$

$$third\ quartile = Q_3 = (\frac{3(n+1)}{4})^{th} \qquad (6)$$

The interquartile range (IQR) is the subtraction of the first quartile from the third quartile

$$IQR = Q_3 - Q_1 \qquad (7)$$

Variance is a measure of how data points vary from the mean i.e. it is the average square distance between the mean value and each data value, it is represented in squared units. Standard deviation is the measure of the distribution of statistical data i.e. the spread of data values around the mean. (Byjus, 2022)

$$variance = \sigma^2 = \frac{\Sigma_{i=1}^{N}(x_i-\mu)^2}{N} \qquad (8)$$

$$standard\ deviation = \sigma = \sqrt{\frac{\sum_{i=1}^{N}(x_i-\mu)^2}{N}} \qquad (9)$$

N is the number of states in the country

X_i are the states votes

μ is the mean of all the states votes in a particular election year.

Skewness is a statistical numerical method to measure the asymmetry of the distribution or data set. It tells the position of the majority of data values in the distribution around the mean value.

$$\gamma = \frac{\frac{1}{n}\Sigma_{i=1}^{n}(x_i-\bar{x})^3}{(\frac{1}{n}\Sigma_{i=1}^{n}(x_i-\bar{x})^2)^{\frac{3}{2}}} \qquad (10)$$

If the coefficient of skewness is greater than 0 then the graph is said to be positively skewed with the majority of the data values less than mean. Most of the values are concentrated on the left side of the graph. If the coefficient of skewness is equal to 0 or approximately close to 0 then the graph is said to be symmetric and the data is normally distributed. If the coefficient of skewness is less than 0 then the graph is said to be negatively skewed with the majority of data values greater than the mean. Most of the values are concentrated on the right side of the graph. Kurtosis is a numerical method in statistics that measures the sharpness of the peak in the data distribution.

$$\gamma = \frac{\frac{1}{n}\Sigma_{i=1}^{n}(x_i-\bar{x})^4}{(\frac{1}{n}\Sigma_{i=1}^{n}(x_i-\bar{x})^2)^2} \qquad (11)$$

If the coefficient of kurtosis is less than 3 then the distribution is platykurtic, if the coefficient of kurtosis is equal to 3 or approximately 3 then the data is mesokurtic i.e. normal distribution,

if the coefficient of kurtosis is greater than 3 then the distribution is leptokurtic i.e. peaked distribution (Geeksforgeeks, 2022)

3.4 Visualization

In this project, bar charts were plotted to analyze state results in the whole of Nigeria, geopolitical zones in Nigeria and each state per election year.

Bar charts is a chart or graph that presents categorical data with rectangular bars with heights or lengths proportional to the values that they represent. It is useful for making comparisons between data. It shows the data with the mode frequency. The horizontal axis represents the states while the vertical axis represents the votes.

Bar charts were used to plot charts for states results in general elections, geopolitical zones and each states contribution in all elections.

The votes cast per state in all the election year was divided by 1000 to make the visualization easier and more understandable by chart.

3.5 Count Data

Count data are data in which the observation can only take counting numbers i.e. a statistical data type which can only take non-negative values (0, 1, 2, 3 …). These data are data in which the observation can only take counting numbers. Example of such data are number of species of flowers on a land, number of sunny days in a year, number of restaurants in a town, number of votes in a school election. (Oppong Richard & Charles Kojo, 2015)

Generalized linear models provide a powerful tool for analyzing count data. It is an advanced statistical modelling technique formulated by John Nelder and Robert Herderburn in 1972. It encompasses many other models e.g. linear regression, logistic regression and Poisson regression.

Assumptions of generalized linear model such as data should be random and independent , the response variable Y does not need to be normally distributed, the original response variable need not have a linear relationship with the independent variable but the transformed response variable is linearly dependent on the independent variables. (Ram, 2021)

3.6 Models for Estimating Count Data

A mathematical model that encompasses set of statistical assumptions concerning the process of sample data is a statistical model. There are a lot of models used for count data, they are Poisson regression, negative binomial regression, zero inflated count models, zero truncated count models, hurdle models, random effects count models. In this project we will be using Poisson model and negative binomial model

3.6.1 Poisson Model

Poisson was named after a French mathematician called Simeon Denis Poisson, it is used to show number of times an event is likely to occur in a specific time. (Adams Hayes & Somer Anderson, 2021) . It is called log linear model when it is used to model contingency tables. E.g. If a shop receives average of 18 calls per hour in a day. No received call affects the probability of receiving another. The number of calls received during any minute has a Poisson probability distribution.

A Poisson distribution $F(K;\lambda) = \Pr(X = k) = \frac{e^{-\lambda}\lambda^{k}}{k!}$ (12)

Where k is the number of occurrences (k =0, 1, 2...)

e is the Euler's number (2.71828…)

$\lambda = \mathrm{E}(\mathrm{X}) = \mathrm{Var}(\mathrm{X})$ i.e. mean is equal to variance

A Poisson model is $\mathrm{P}(\mathrm{Y_i} = \mathrm{y_i}) = \frac{\mathrm{e}^{-\mu}\mu^{\mathrm{yi}}}{\mathrm{y_i}}$; $\mathrm{y_{i\,=0,1,2\ldots}}$ (13)

Log linear specification of Poisson model is $\log(\mu_i) = x_i'\beta$

The expected number of events per period is $E(y_i|x_i) = \mu_i = e^{x_i'\beta}$

Thus $\frac{dE(y_i|x_i)}{dx_i} = \beta e^{x_i'\beta} = \beta_i\mu_i$ (14)

Major assumption of Poisson model is $E(y_i|x_i) = \mu_i = e^{x_i'\beta} = Var((y_i|x_i)$ (15)

If $Var((y_i|x_i) > E(y_i|x_i)$ then there is over dispersion and if $Var((y_i|x_i) < E(y_i|x_i)$ then there is under dispersion in the distribution.

3.6.2 Negative Binomial

A negative binomial random variable is the number *X* of repeated trials to produce *r* successes in a negative binomial experiment. Negative binomial is also called Pascal distribution. It is different from binomial because we look for number of successes and number of trials is fixed but in negative binomial, number of trials is not fixed and we look for number of failures. E.g. in a rolling a die experiment, let throwing a five be regarded as failure and throwing other numbers as successes, if the instruction is that how many successes will occur before we see the fourth failure (r =4). In a case, the probability distribution of the number of non-fives that appears will be a negative binomial distribution. (Cook, 2009)

$$F(K, \lambda, p) = \Pr(X = k) = \frac{(k+r-1)!}{(r-1)!(k)!}\ (1-p)^k\, p^r \qquad (16)$$

Where r is the number of successes

k is the number of failures

p is the probability of success

the mean of a negative binomial is $\frac{(1-p)r}{p}$

the variance of a negative binomial is $\frac{(1-p)r}{p^2}$

3.6.3 Residual Plot

A residual value is a measure of the distance between the data point and the regression line. A residual plot has the residual values on the y axis and x axis displays the independent variable. Residual plot is the difference between predicted values of y and measured values. Model with lesser value of residual is best fit

$$\text{Residual value} = y_i - \hat{y}_i \quad (17)$$

3.6.4 Likelihood Test

Likelihood ratio test also known as likelihood ratio chi square test is a test that assesses the goodness of fit of two competing statistical models based on the ratio of their likelihoods. It is also known as wilks test.

$$LRT = -2log_e\left(\frac{L_s(\hat{\theta})}{L_g(\hat{\theta})}\right) \quad (18)$$

3.6.5 AIC and BIC

The Akaike information criterion (AIC) is a refined technique for estimating the likelihood of a model to predict/estimate future values based on in-sample fit.

The formula for AIC (Akaike information criterion)

$$AIC = \frac{-2}{N} LL + \frac{2}{k} N \quad (19)$$

Where N is the number of examples in the training dataset,

LL is the log likelihood of the model on the training dataset

k is the number of parameters in the model.

To use AIC model, we simply choose the model with the least value as a best fit.

The Bayesian information criterion (BIC) is another model selection criterion that assesses the trade-off between model fit and model complexity. A better match is indicated by a lower AIC or BIC value. The formula for BIC (Bayesian information criterion) is

$$BIC = -2\,LL + \log(N)\,K \tag{20}$$

Where log () has the base e called the natural logarithm.

LL is the log likelihood of the model,

N is the number of examples in the training dataset and

K is the number of parameters in the model.

The BIC with the least value is selected as best fit.

3.6.6 Null and Residual Deviance

The null deviance tells us how to well the response variables can be predicted by a model with only an intercept term.

The residual deviance tells us how well the response variable can be predicted by a model with p predictor variables.

The lower the value of null and residual deviance, the better the model is able to predict the value of the response variable.

CHAPTER 4

ANALYSIS

4.0 Introduction

This chapter contains analysis done on this project. It includes analysis of each election year, the analysis of each geopolitical zones in an election year and the analysis of total votes in each state in an election year.

4.1 Descriptive Analysis of Election

S/N	BASIC STATISTICS	1999 ELECTIONS	2003 ELECTIONS	2007 ELECTIONS	2011 ELECTIONS	2015 ELECTIONS	2019 ELECTIONS
1	SUM	29848441	42018735	NA	38199219	29437083	28614190
2	MINIMUM	99022	274620	NA	261858	309445	335856
3	MAXIMUM	1751981	2339792	NA	2673228	2172447	1964751
4	1^{ST} QUARTILE	597008	879826	NA	621192	491767	553496
5	MEDIAN	816574	1052885	NA	909808	663373	625035
6	3^{RD} QUARTILE	904713	1248897	NA	1232395	1000692	896976
7	MEAN	806715	1135642	NA	1032411	795597	773357
8	RANGE	1652959	2065172	NA	2411370	1863002	1628895
9	INTERQUARTILE RANGE	307705	369071	NA	611203	508925	343480
10	VARIANCE	128713234932	218477123247	NA	321918091016	185761617771	139899396611
11	STANDARD DEVIATION	358766.3	467415.4	NA	567378.3	431000.7	374031
12	SKEWNESS	0.7796529	0.9455953	NA	1.221592	1.35517	1.512897
13	KURTOSIS	3.874361	3.710633	NA	4.262697	4.407011	5.13462

Table 4.1: Descriptive Statistics of Vote Cast by States in Nigeria in 5 Election Years

In 1999, the number of valid votes was 29848441, the least vote was 99022, and the highest vote by any state was 1751981. There was no mode because no state have same result, If the total votes were divided into four equal parts then the first part which is the first quartile (middle part of the lower level of the observation) is 597008, the second quartile which is the same as the median is 816574 and the third quartile (the middle value of the upper level of the observation is 904713. The mean (average of all votes cast by states) was 806715, the range which is the difference between the highest and lowest vote is 1652959. The interquartile range shows that the middle 50% of votes cast is 307705. The variance 128713234932, which is too large tells us that the votes per state are very well spread out from the mean and from one another. The standard deviation of 363591.7, tells us that the votes are well spread out from the mean. The skewness at 0.7796 shows that the votes in 1999 were positively skewed. The kurtosis 3.874 is greater than 3 therefore it is leptokurtic.

In 2003, the total vote cast was 42018735, the least vote was 274620, and the highest vote by any state was 2339792. There was no mode because no state have the same result, If the total votes were divided into four equal parts then the first part which is the first quartile (middle part of the lower level of the observation) is 879826, the second quartile which is the same as the median is 1052885 and the third quartile (the middle value of the upper level of the observation is 1248897. The mean (average of all votes cast by states) was 1135642, the range which is the difference between the highest and lowest vote is 2065172. The interquartile range shows that the middle 50% of votes cast is 369071. The variance 218477123247, which is too large tells us that the votes per state are very well spread out from the mean and from one another. The standard deviation of 467415.4, it tells us that the votes are well spread out from the mean. The skewness at 0.9456 shows that the votes in 2003 were positively skewed. The kurtosis 3.711 is leptokurtic i.e. it shows a sharp peak on the graph.

In 2007, the official results of states in the general elections was not released therefore the data is not available.

In 2011, the valid vote was 38199219, the least vote was 261858, and the highest vote by any state was 2673228. There was no mode because no state have the same result, If the total votes were divided into four equal parts then the first part which is the first quartile (middle part of the lower level of the observation) is 621192, the second quartile which is the same as the median is 909808 and the third quartile (the middle value of the upper level of the observation is 1232395. The mean (average of all votes cast by states) was 1032411, the range which is the difference between the highest and lowest vote is 2411370. The interquartile range shows that the middle 50% of votes cast is 611203. The variance 321918091016, which is too large tells us that the votes per state are very well spread out from the mean and from one another. The standard deviation of 567378.3, tells us that the votes are well spread out from the mean. The skewness at 1.2216 shows that the votes in 2011 were positively skewed. The kurtosis 4.2627 is greater than 3 then the data is leptokurtic.

In 2015, the total vote cast was 29437083, the least vote was 309445, and the highest vote by any state was 2172447. There was no mode because no state have the same result, If the total votes were divided into four equal parts then the first part which is the first quartile (middle part of the lower level of the observation) is 491767, the second quartile which is the same as the median is 663373 and the third quartile (the middle value of the upper level of the observation is 1000692. The mean (average of all votes cast by states) was 795597, the range which is the difference between the highest and lowest vote was 1863002. The interquartile range shows that the middle 50% of votes cast is 508925. The variance 185761617771, which is too large tells us that the votes per state are very well spread out from the mean and from one another. The standard deviation of 431000.7, tells us that the votes are well spread out from

the mean. The skewness at 1.3552 shows that the votes in 2015 were positively skewed. The kurtosis 4.4070 is leptokurtic i.e. it shows a sharp peak on the graph

In 2019, the total vote cast was 28614190, the least vote was 335856, and the highest vote by any state was 1964751. There was no mode because no state have the same result, If the total votes were divided into four equal parts then the first part which is the first quartile (middle part of the lower level of the observation) is 553496, the second quartile which is the same as the median is 625035 and the third quartile (the middle value of the upper level of the observation is 896976. The mean (average of all votes cast by states) was 773357, the range which is the difference between the highest and lowest vote is 16288895. The interquartile range shows that the middle 50% of votes cast is 343480. The variance 139899396611, which is too large tells us that the votes per state are very well spread out from the mean and from one another. The standard deviation of 374031.3, tells us that the votes are well spread out from the mean. The skewness at 1.5129 shows that the votes in 2019 are positively skewed. The kurtosis 5.1346 is leptokurtic and shows a sharp peak on the graph.

4.2 Visualization of State Results Per Election

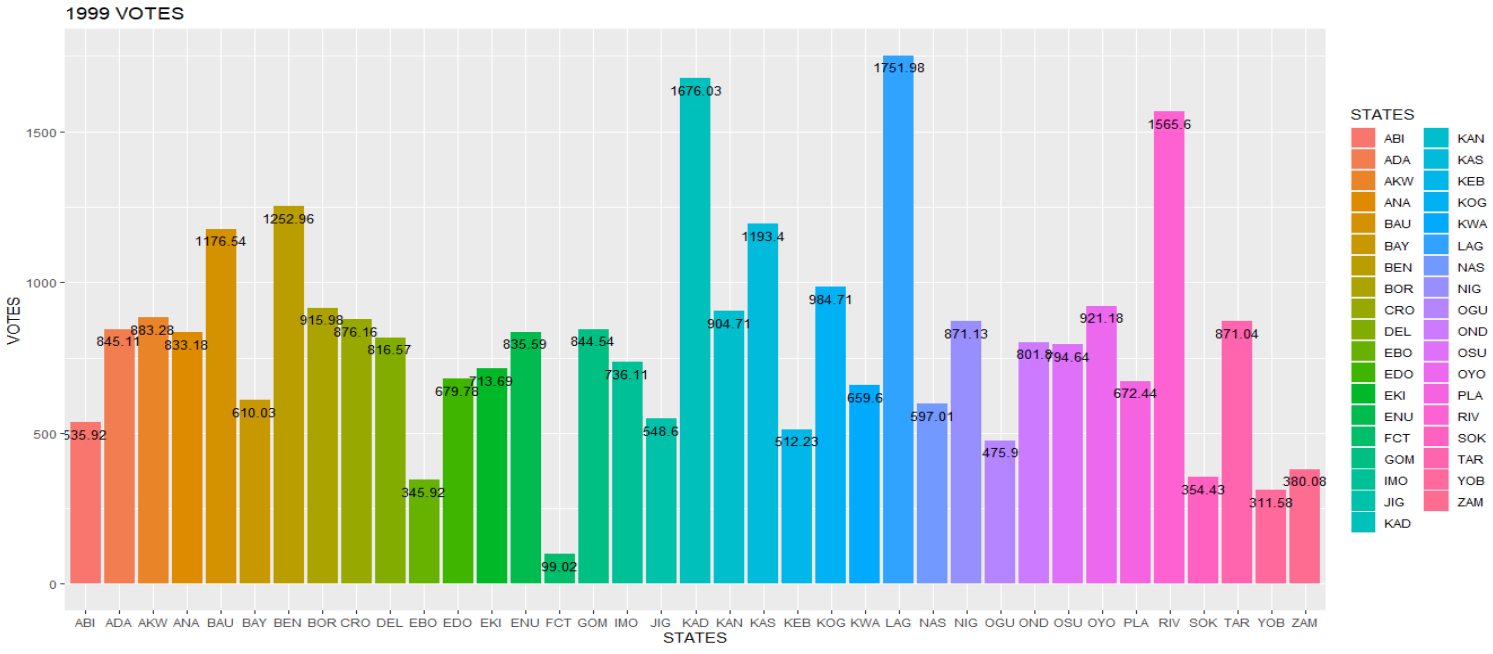

Fig 4.1: 1999 Election Results by States in Nigeria

From the chart above, Lagos had the highest vote, Kaduna came second and Rivers was third.

The last three states in the echelon with the least votes were Ebonyi, Yobe and lastly FCT.

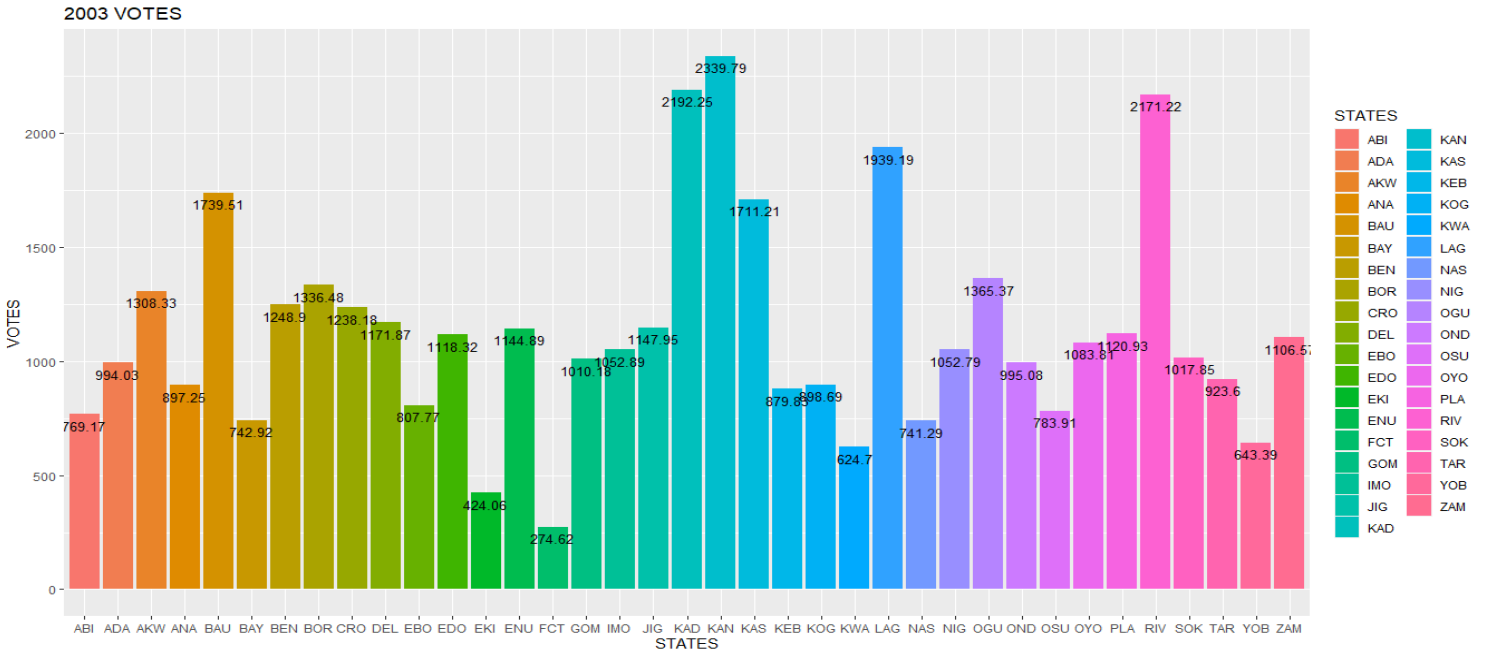

Fig 4.2: 2003 Elections Results by States in Nigeria

From the chart above, Kano had the highest vote, Kaduna came second and Rivers was third.

The last three states in the echelon with the least votes were Kwara, Ekiti and lastly FCT

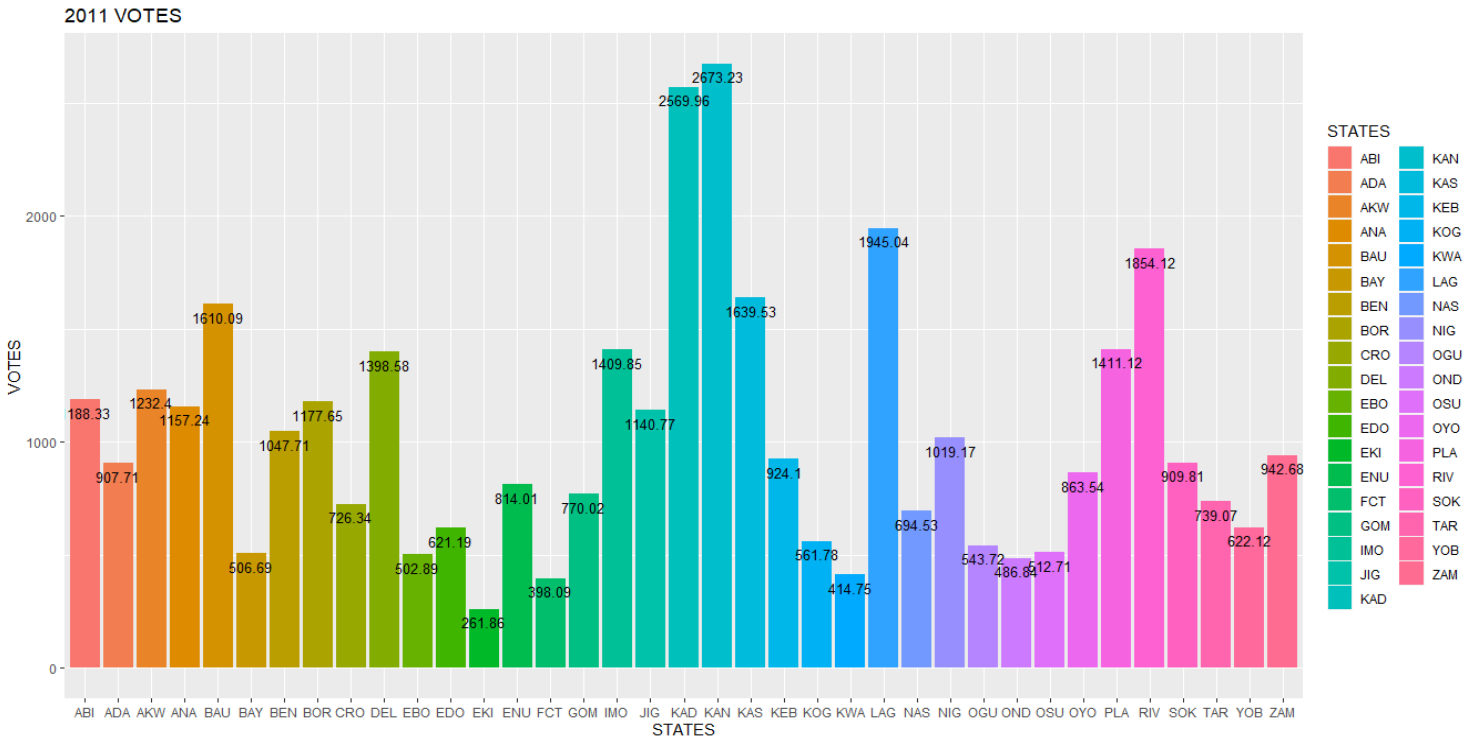

Fig 4.3: 2011 Election Result by States in Nigeria

.From the chart above, Kano had the highest vote, Kaduna came second and Lagos was third.

The last three states in the echelon with the least votes were Kwara, FCT and lastly Ekiti.

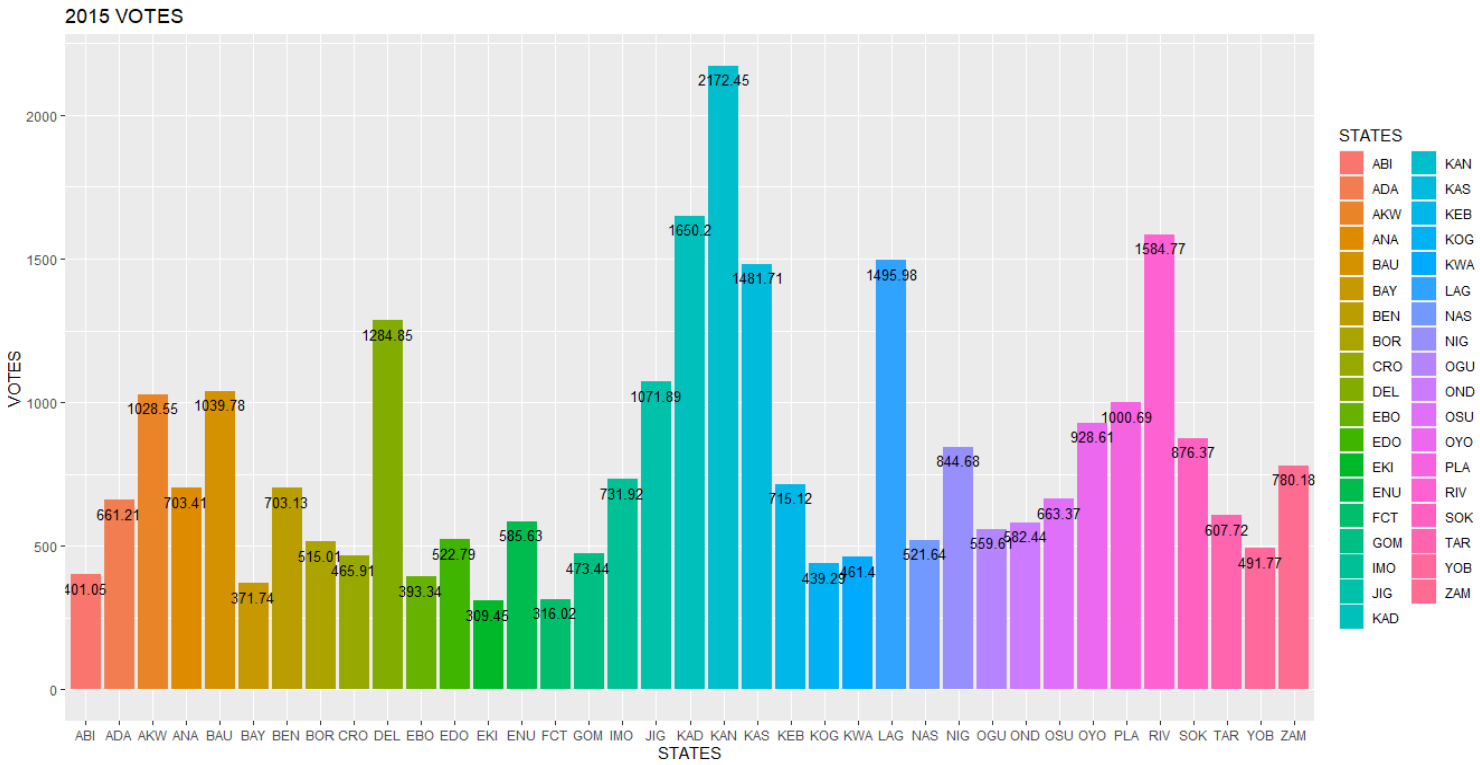

Fig 4.4: 2015 Election Result by States in Nigeria

From the chart above, Kano had the highest vote, Kaduna came second and Rivers was third.

The last three states in the echelon with the least votes were Bayelsa, FCT and lastly Ekiti.

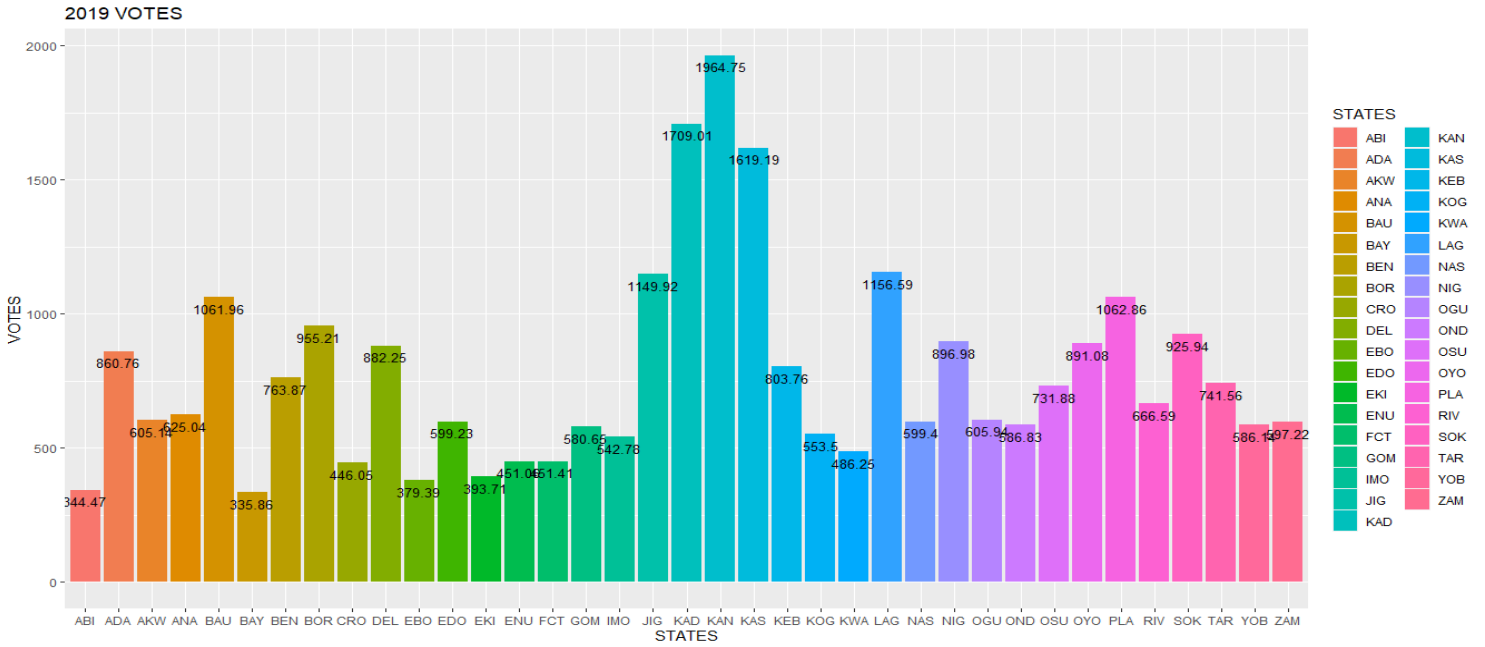

Fig 4.5: 2019 Election Result by States in Nigeria

From the chart above, Kano had the highest vote, Kaduna came second and Kastina was third. The last three states in the echelon with the least votes were Ebonyi, Abia and lastly Bayelsa.

4.3 Visualization of Geopolitical Zones Per Election

The votes by geopolitical zones in Nigeria (North central, North east, North West, South east, South west and South south) are visualized below according to year of elections. In the chart, var1 represent 1999, var2 represent 2003, var3 represent 2011, var4 represent 2015 and var5 represent 2019

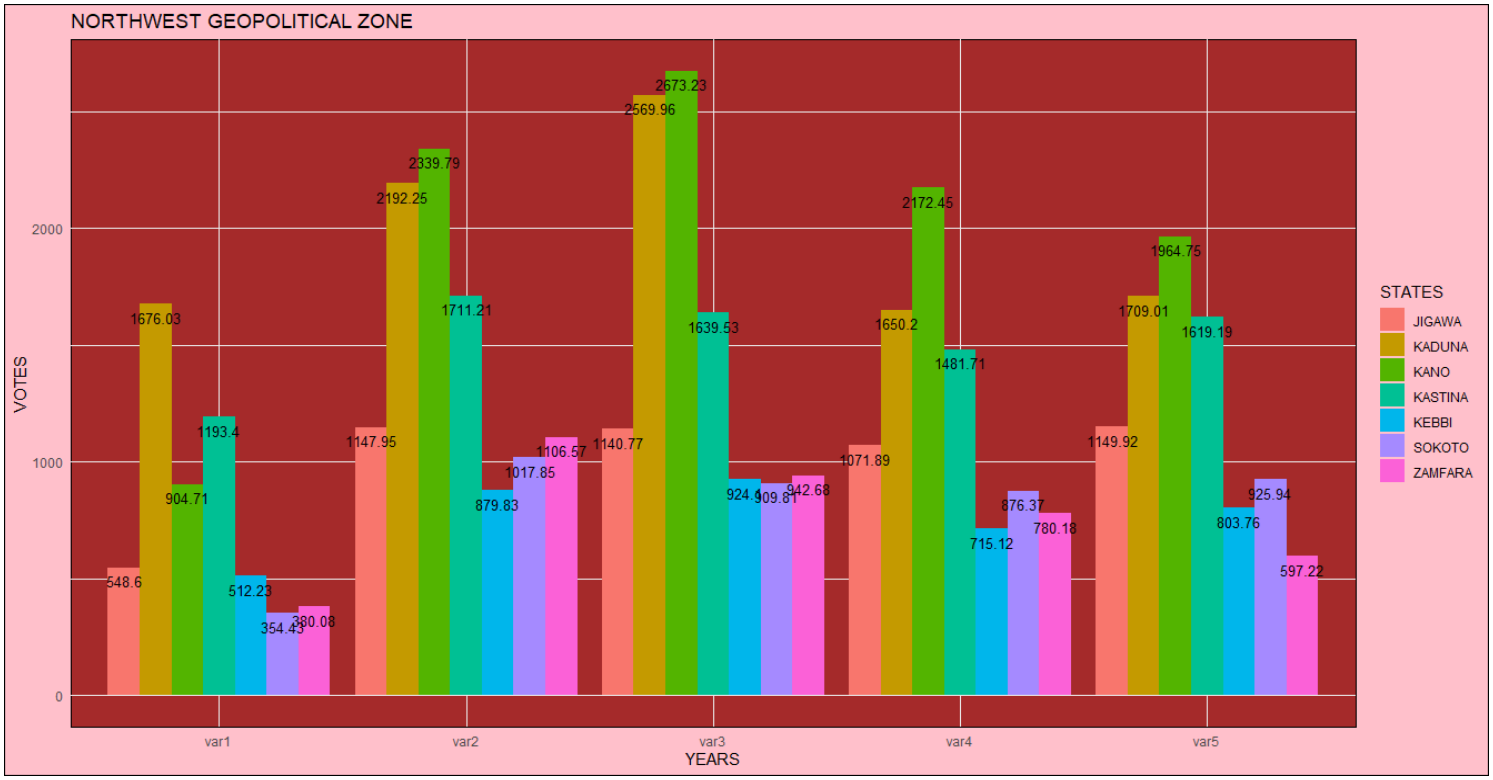

Fig 4.6: North West Geopolitical Zone Results In All Elections

The above chart shows the results of the northwestern states in general elections. In 1999, Kaduna had the highest votes and Sokoto had the least votes, in 2003, Kano overtook Kaduna to claim the highest votes and Kebbi had the least votes. In 2011, Kano remained the highest contributor of votes in the general election and Sokoto had the least votes, in 2015, Kano had the highest votes and Kebbi had the least votes. In 2019, Kano remained top while Zamfara came last in terms of contributed votes in the general elections.

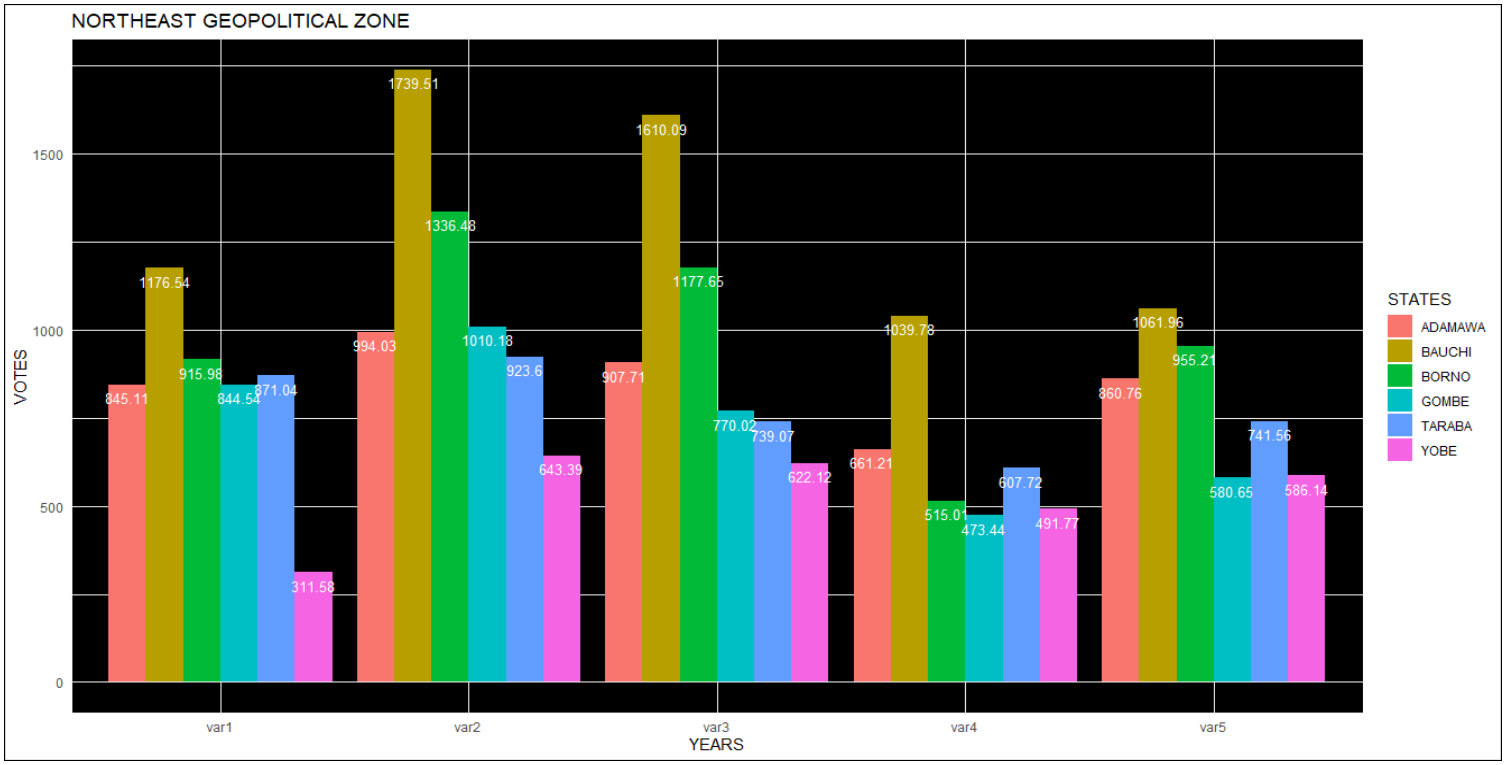

Fig 4.7: North East Geopolitical Zone Results in All Elections

The above chart shows the results of the northeastern states in general elections. In 1999, 2003 and 2011, Bauchi had the highest votes and Yobe had the least votes. In 2015 and 2019, Bauchi had the highest votes while Gombe had the least votes.

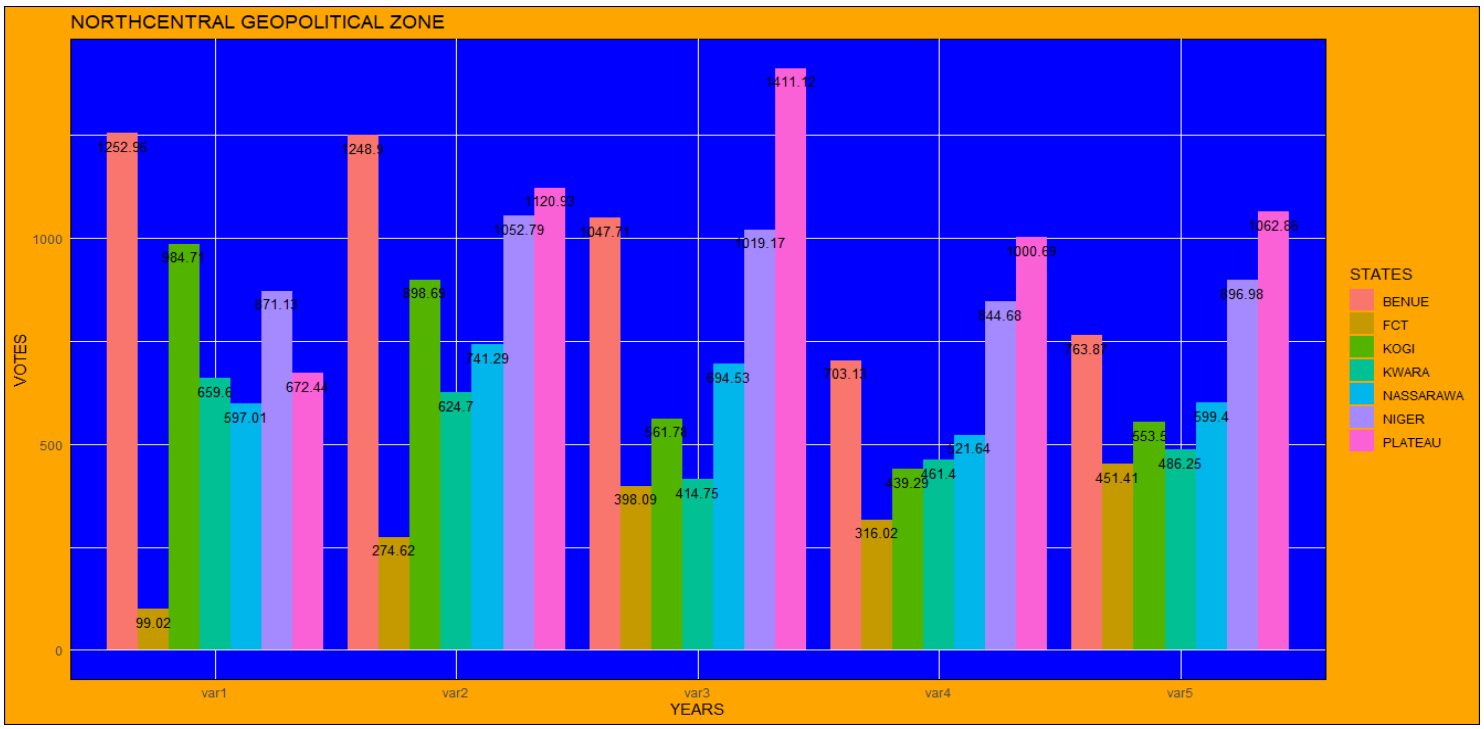

Fig 4.8: North Central Geopolitical Zone Results In All Elections

The above chart shows the result of the north central states in general elections. In 1999 and 2003, Benue had the highest votes and FCT had the least votes. In 2011, 2015 and 2019, Plateau had the highest votes while FCT had the least votes.

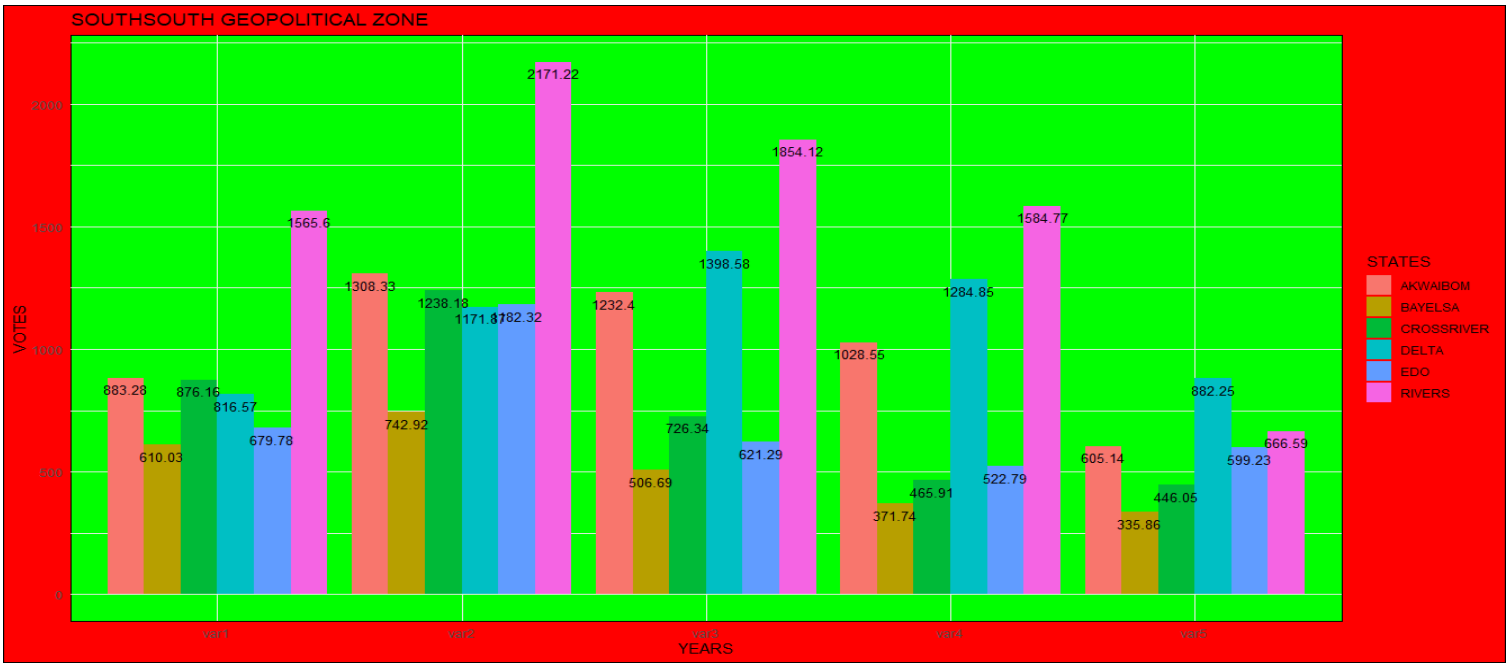

Fig 4.9: South South Geopolitical Zone in All Elections

The above chart shows the result of the south southern states in general elections. In 1999, 2003, 2011 and 2015, Rivers state had the highest votes while Bayelsa had the least votes. In 2019, Delta state had the highest votes while Bayelsa state had the least votes.

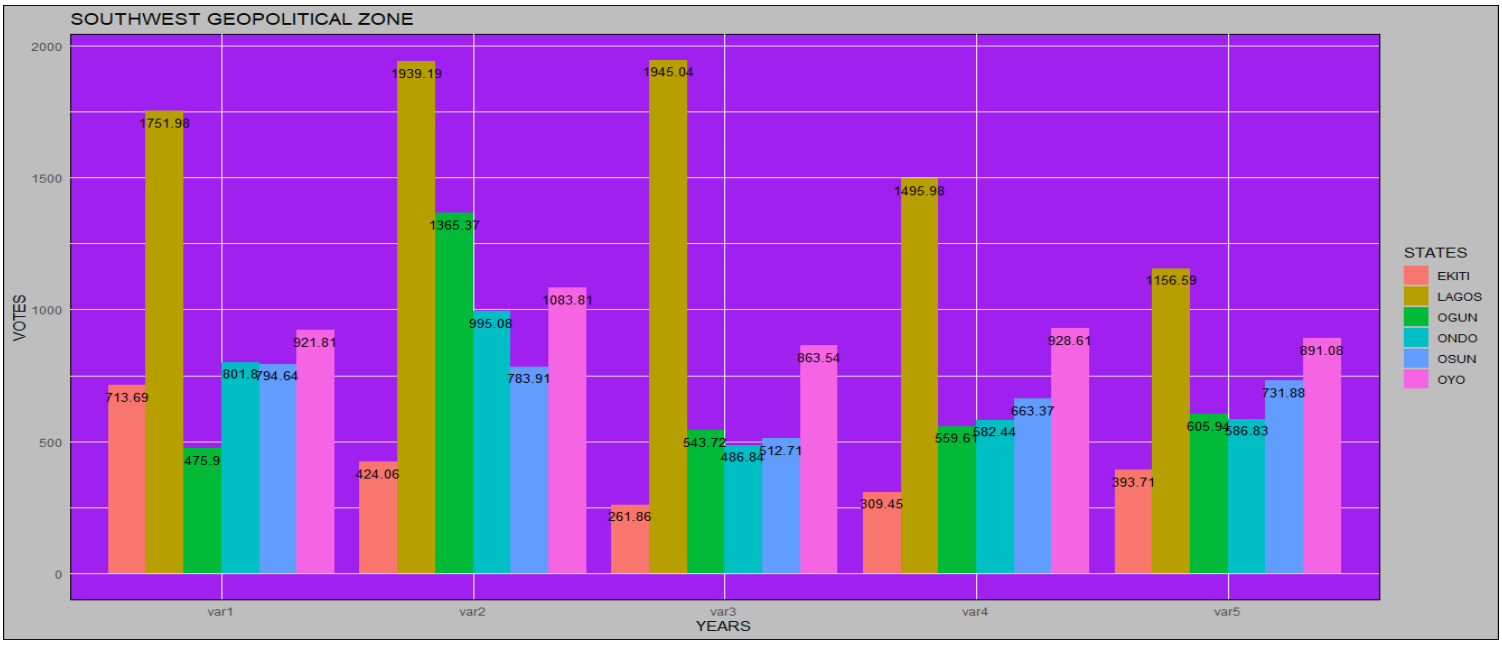

Fig 4.1.0: South West Geopolitical Zone in All Elections

The above chart shows the result of the south western states in general elections. In 1999, Lagos state had the highest votes while Ogun state had the least votes. In 2003, 2011, 2015 and 2019, Lagos state had the highest votes and Ekiti had the least votes.

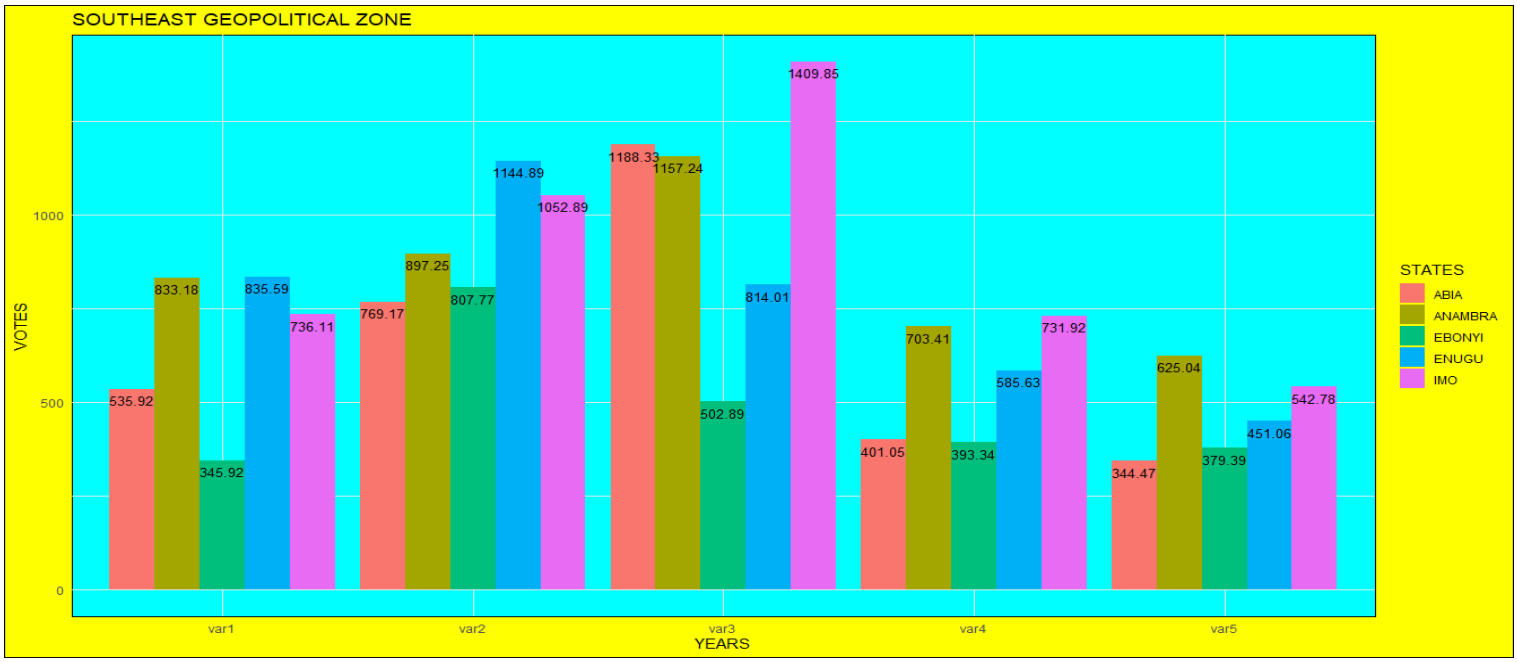

Fig 4.1.1 South East Geopolitical Zones in All Elections

The above chart shows the result of the south eastern states in general elections. In 1999, Enugu state had the highest votes and Ebonyi state had the least votes. In 2003, Enugu state had the highest votes while Abia state had the least votes. In 2011 and 2015, Imo state had the highest votes and Ebonyi state had the least votes. In 2019, Anambra state had the highest votes while Abia state had the least votes.

4.4 Visualization of Each State Votes in All Election Year

All the charts below show the total votes gotten in each state during all the election year since 1999 to 2019. 2007 election result per state was not available.

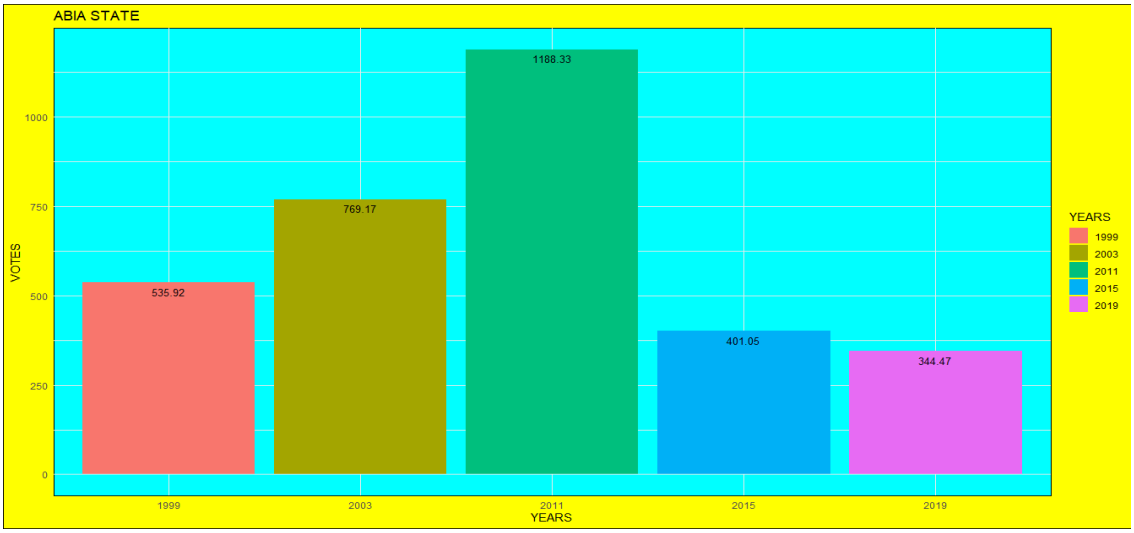

Fig 4.1.2.

Abia state contributed its highest vote in a general election in 2011 and the least in the year 2019.

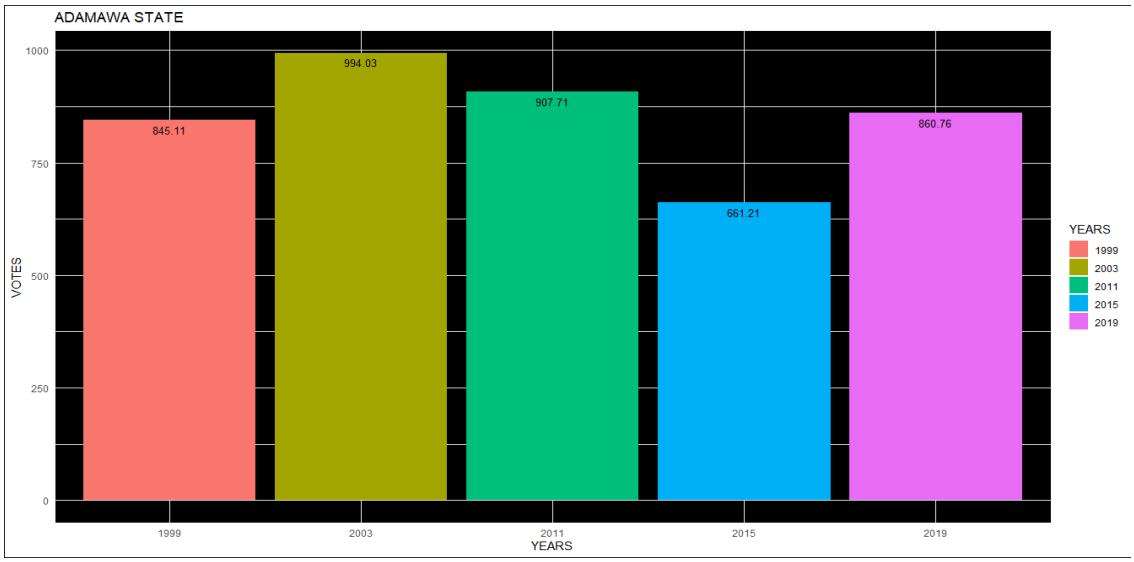

Fig 4.1.3

Adamawa state contributed its highest vote in a general election in 2003 and the least in 2015.

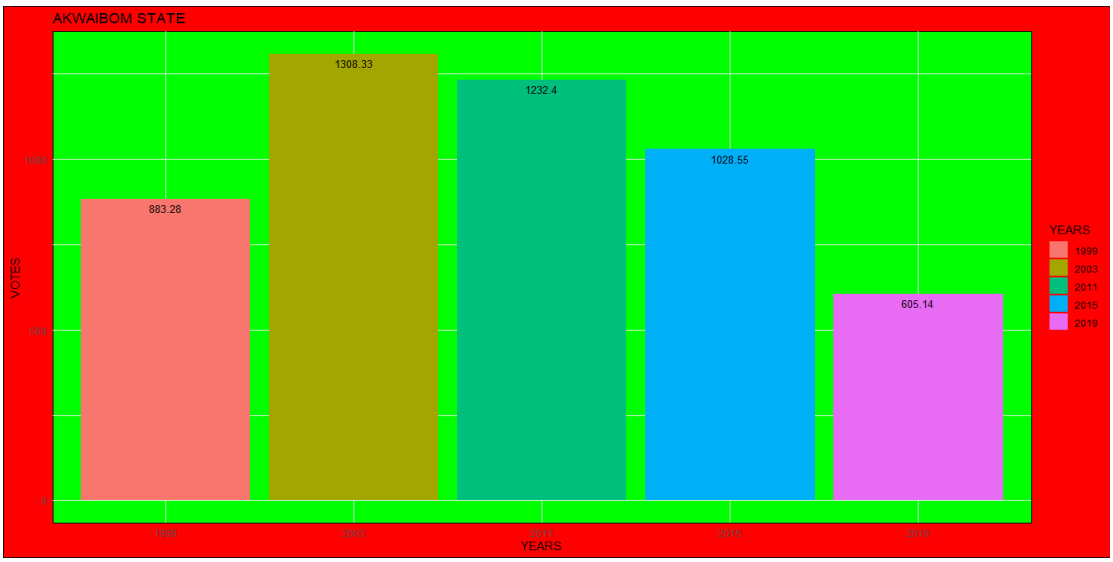

Fig 4.1.4

Akwaibom state contributed its highest vote in a general election in 2011 and the least in 2019.

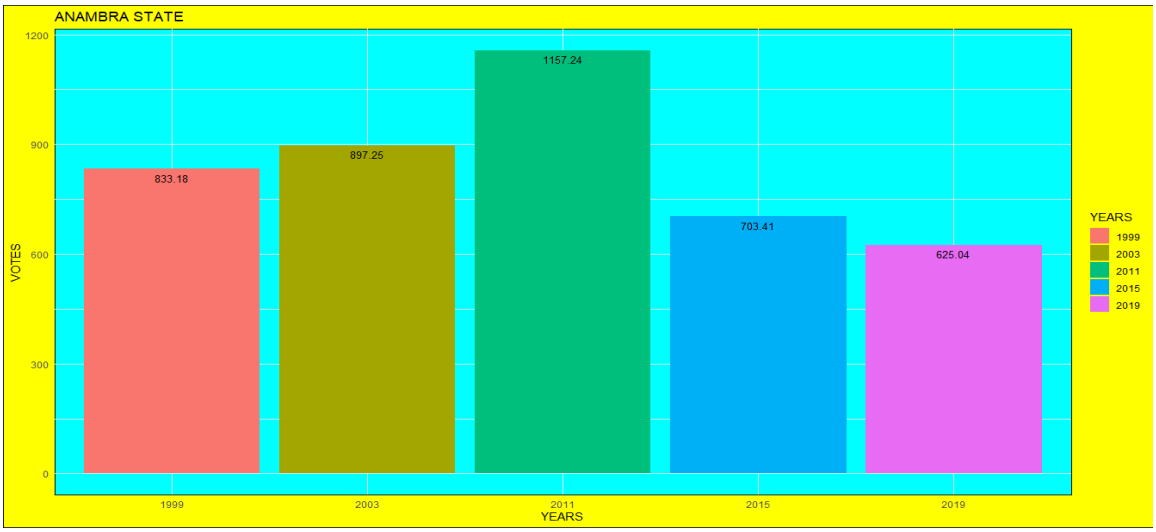

Fig 4.1.5

Anambra state voted it's highest in a general election in 2011 and least in the year 2019.

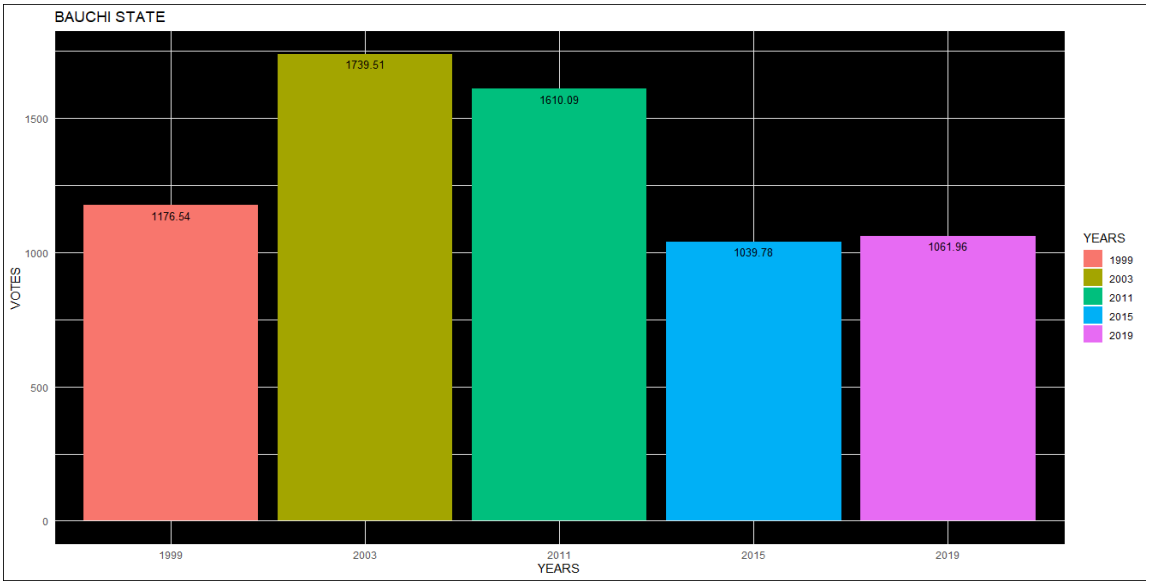

Fig 4.1.6

Bauchi state voted its highest in a general election in 2003 and the least votes in 2015.

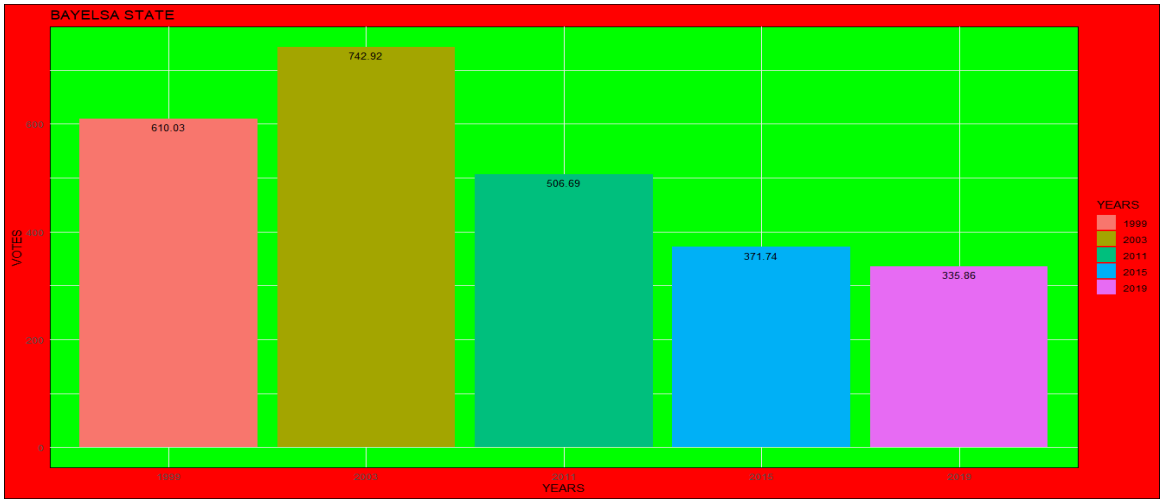

Fig 4.1.7

Bayelsa had its highest vote in a general election in the year 2003 and least in 2019.

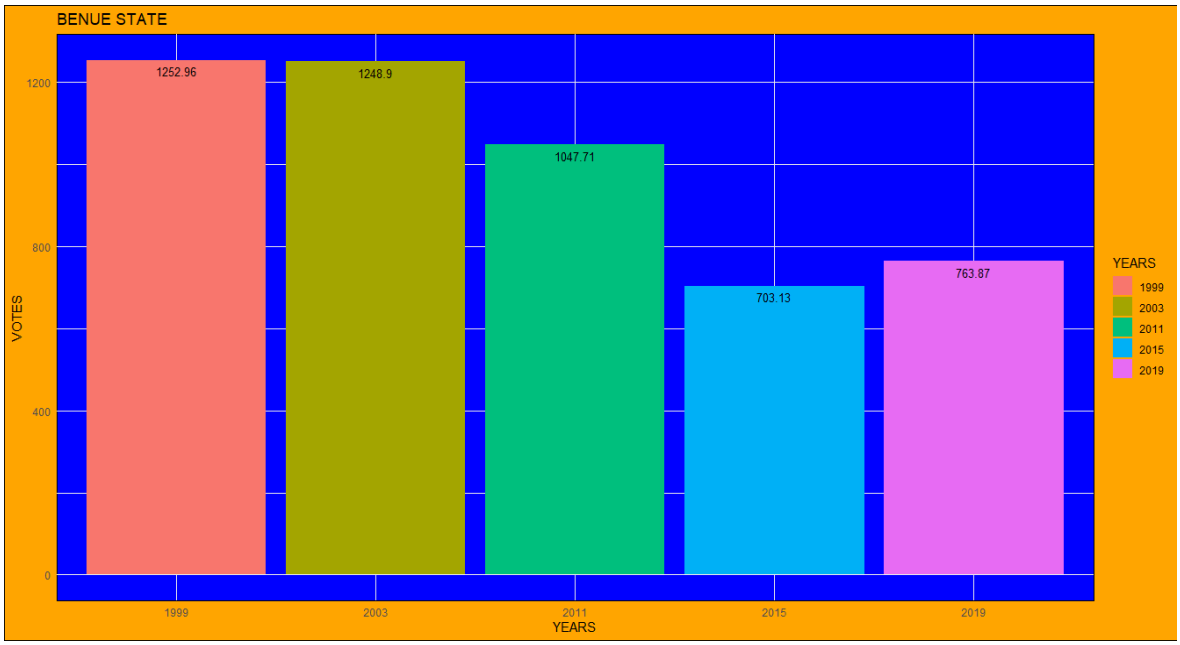

Fig 4.1.8

Benue state contributed its highest in a general election in the year 1999 and the least in 2015.

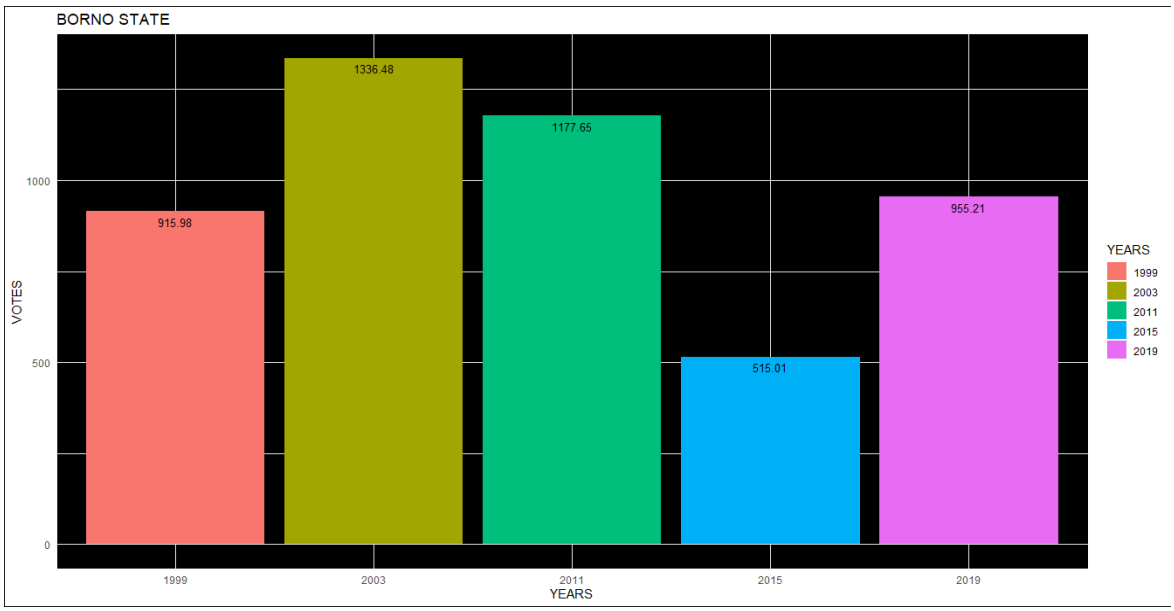

Fig 4.1.9

Borno state contributed its highest vote in 2003 and the least vote in 2015.

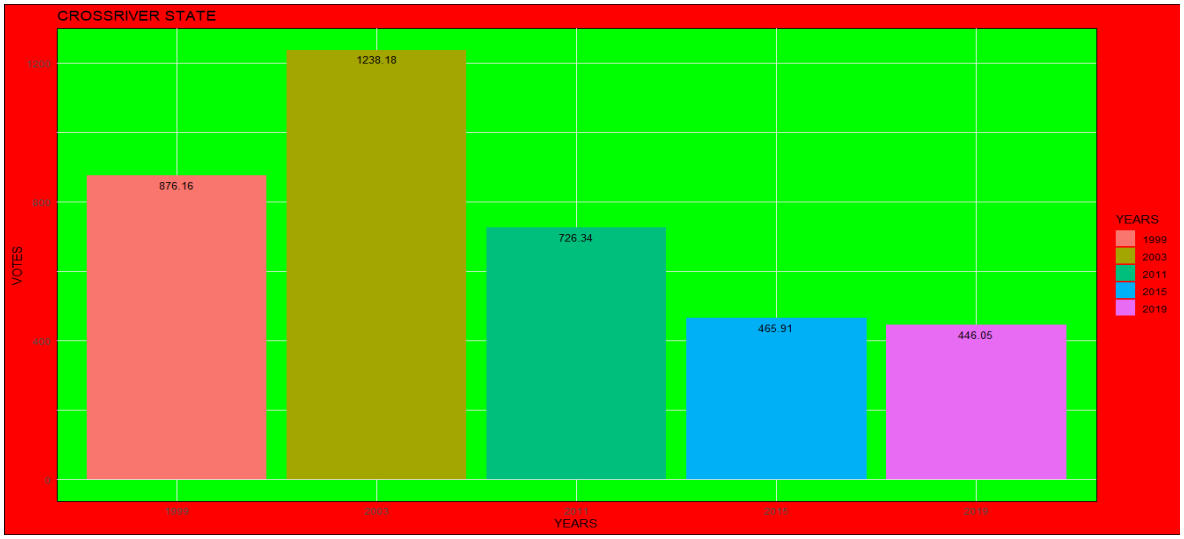

Fig 4.2.0

Cross river state had its highest vote in 2003 and least vote in 2019.

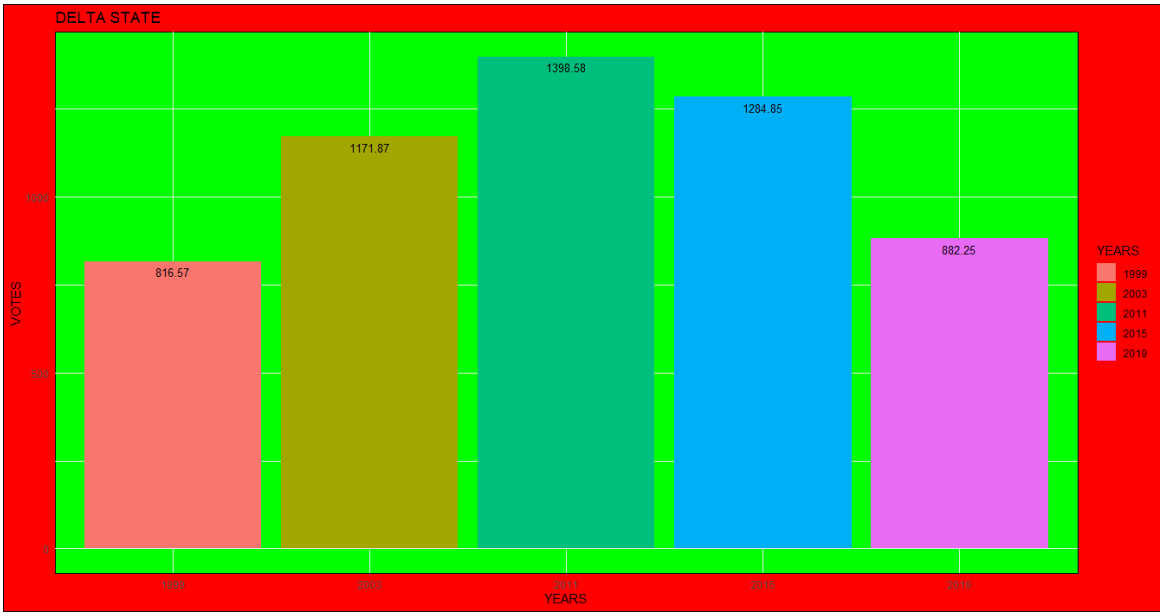

Fig 4.2.1

Delta state contributed its highest in a general election in 2011 and least in 1999.

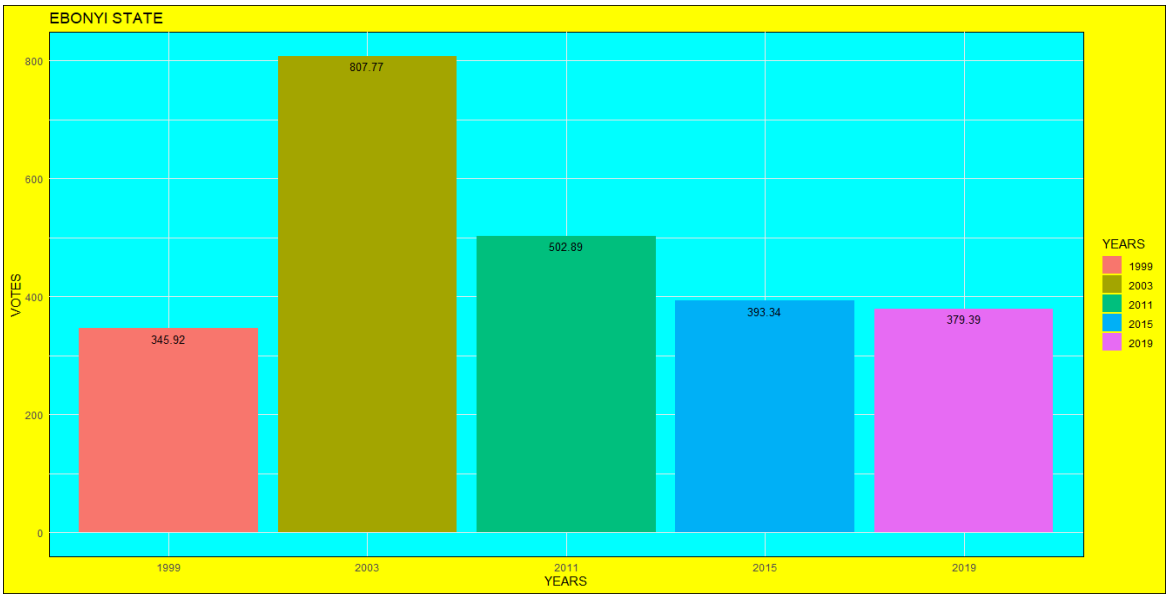

Fig 4.2.2

Ebonyi state contributed its highest in a general election in 2003 and least in 1999.

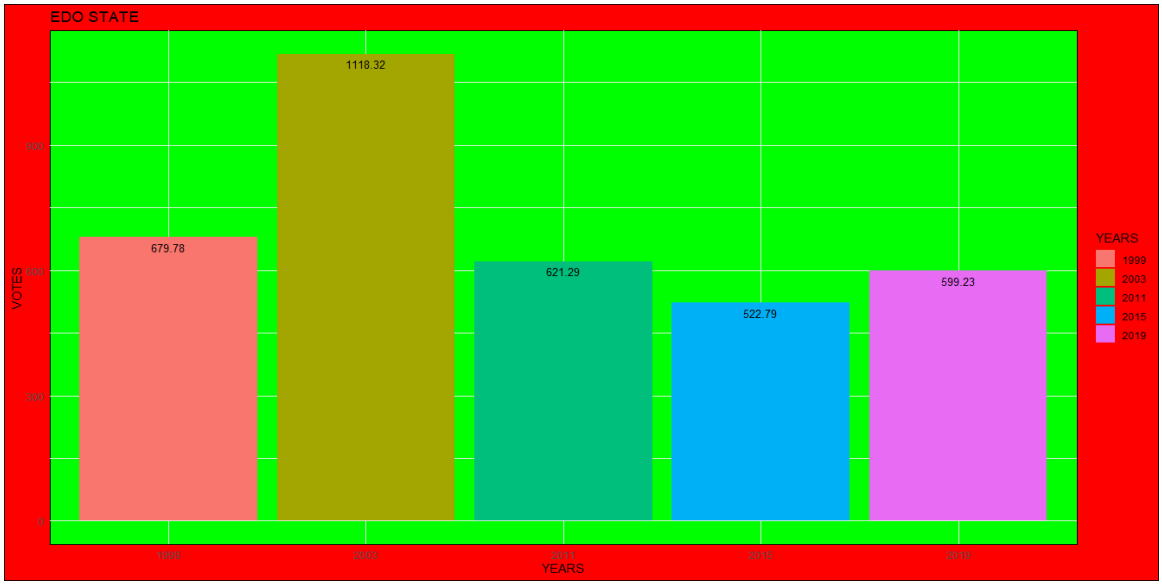

Fig 4.2.3

Edo state contributed its highest in a general election in 2003 and least in 2015.

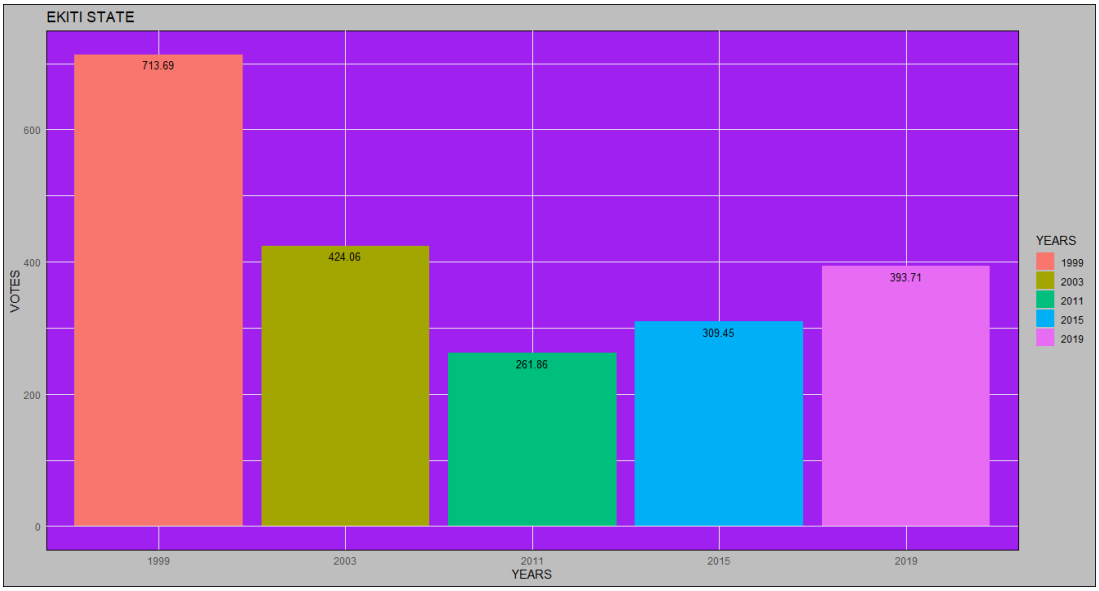

Fig 4.2.4

Ekiti state contributed its highest in 1999 and least contribution was in the year 2011.

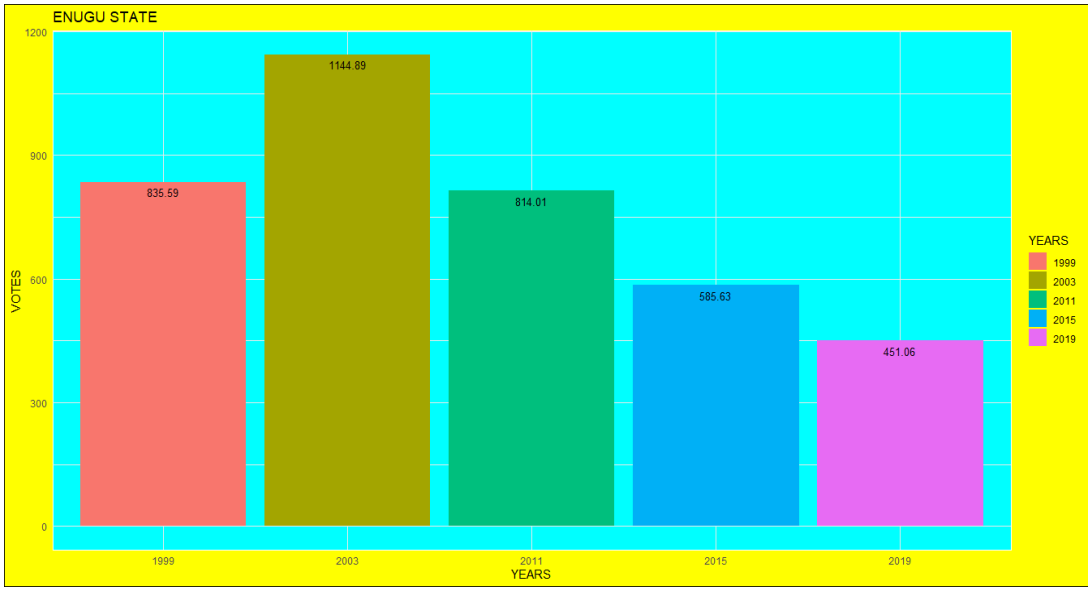

Fig 4.2.5

Enugu state had its highest vote in a general election in 2003 and the least was in 2019.

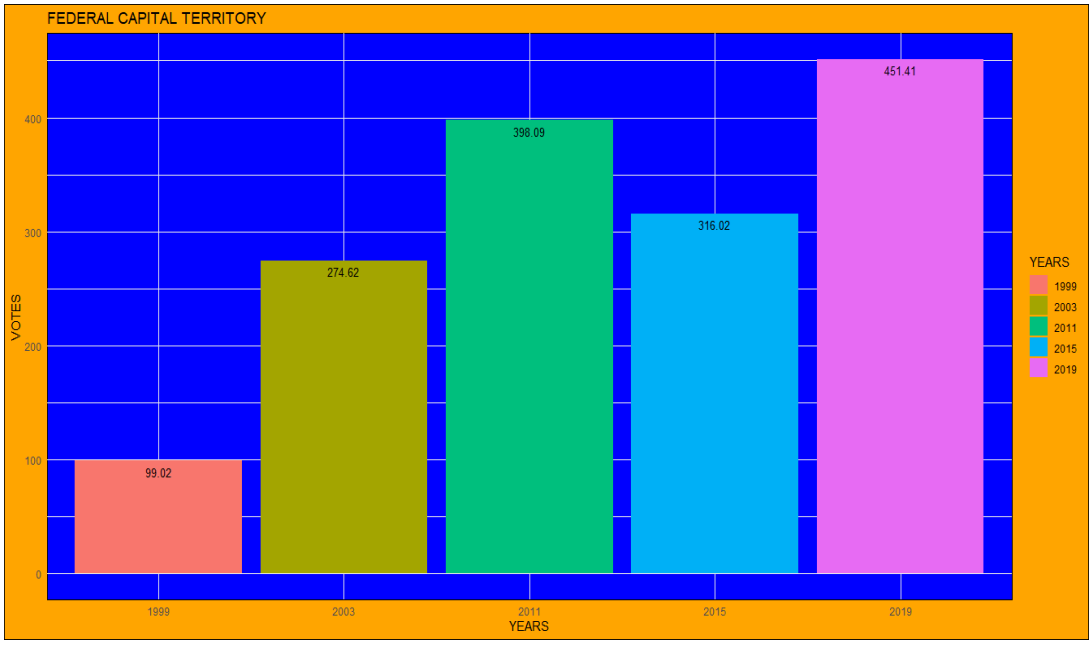

Fig 4.2.6

The federal capital territory had its highest votes in 2019 and least votes in 1999.

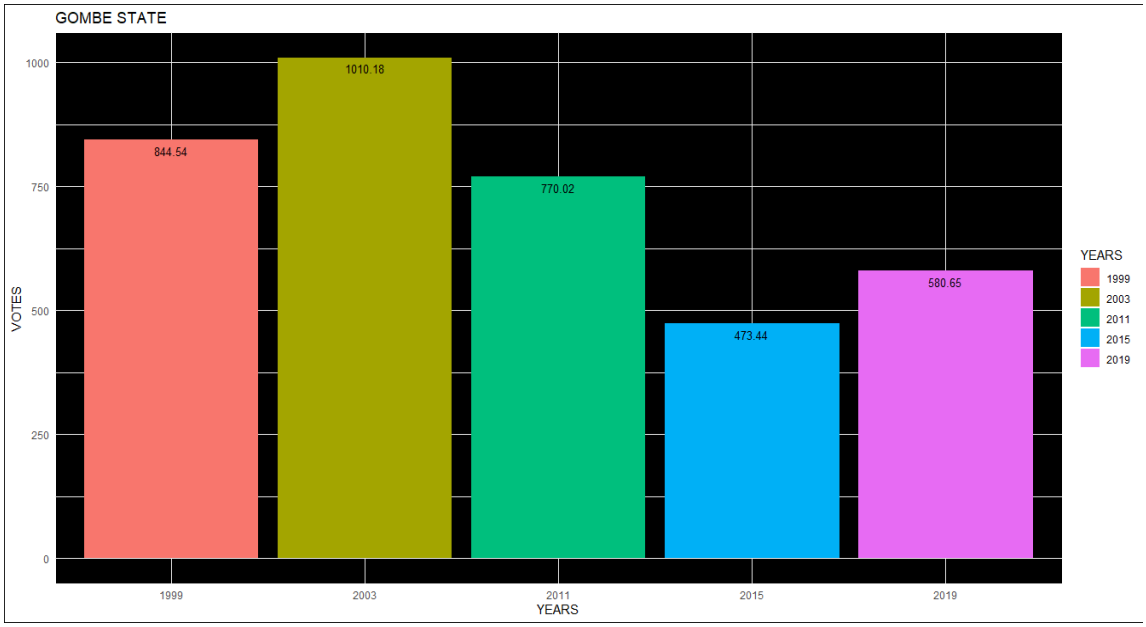

Fig 4.2.7

Gombe state had its highest vote in a general election in 2003 and the least in 2015.

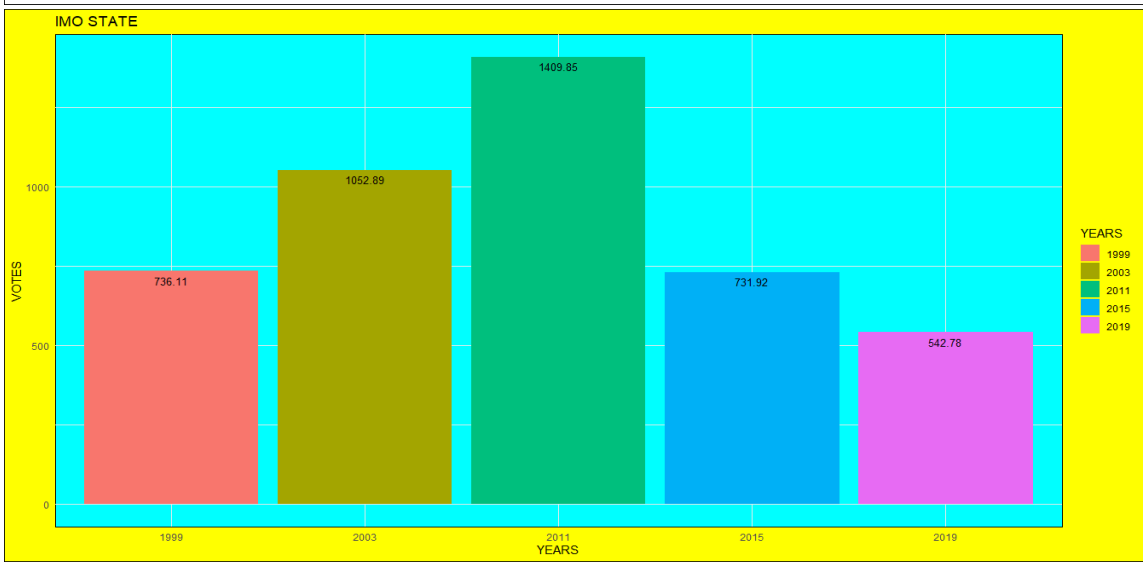

Fig 4.2.8

Imo state had its highest vote in a general election in 2011 and least in 2019.

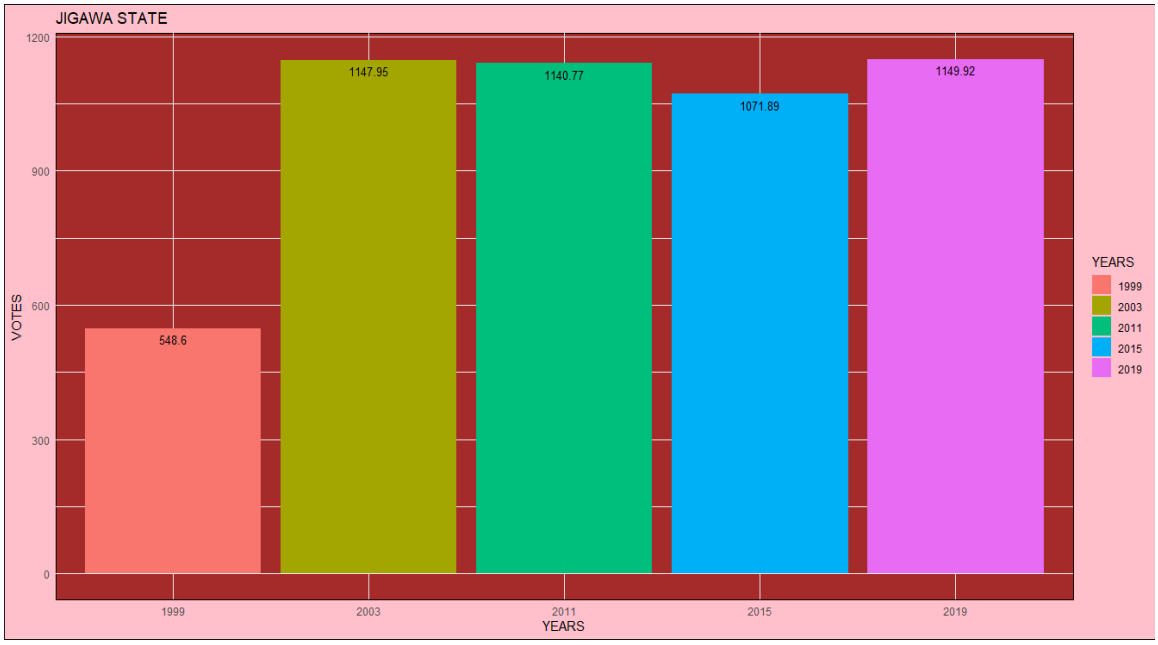

Fig 4.3.0

Jigawa state had its highest vote in a general election in 2019 and the least in 1999.

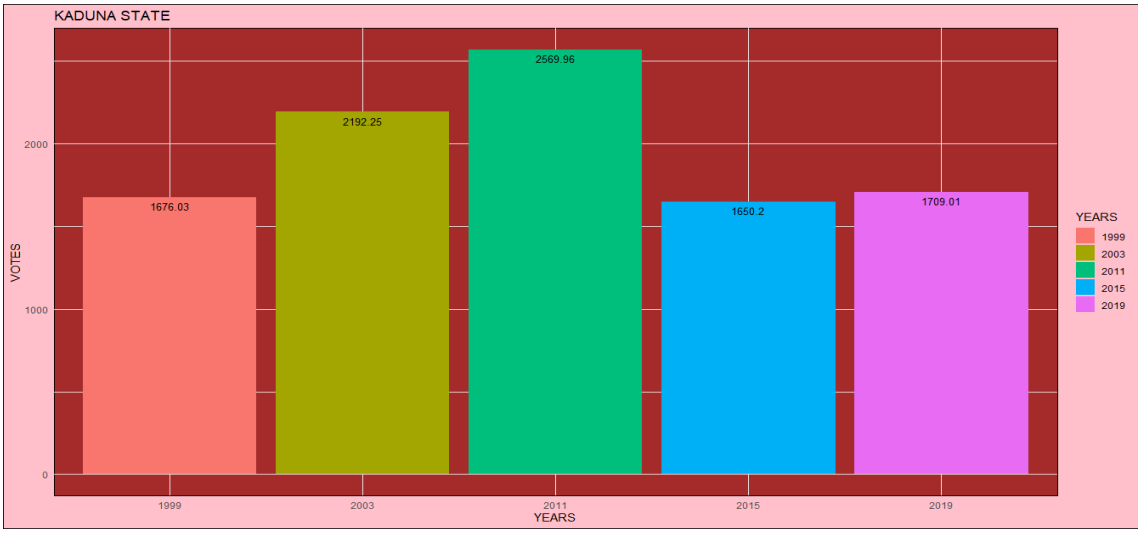

Fig 4.3.1

Kaduna state contributed its highest votes in a general election in 2011 and least votes in 2015.

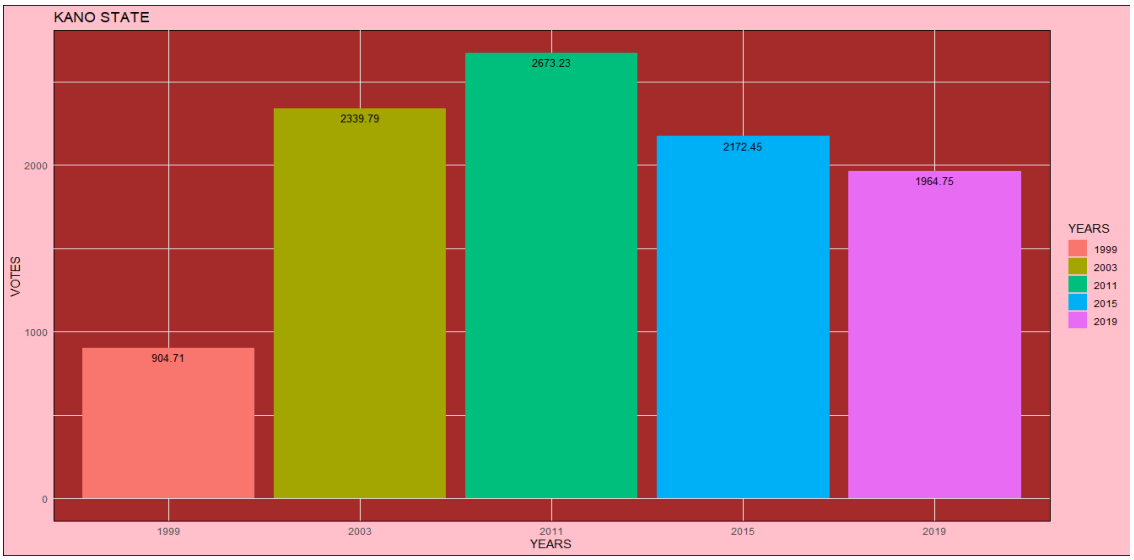

Fig 4.3.2

Kano state contributed its highest vote in a general election in 2011 and least votes in 1999.

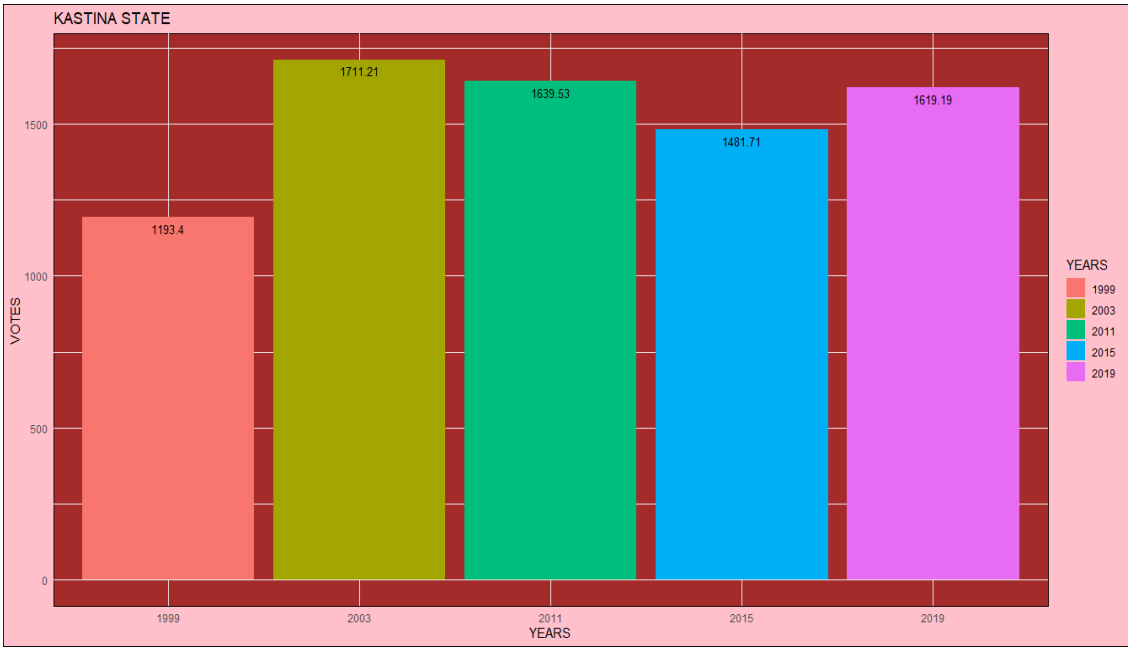

Fig 4.3.3

Kastina state contributed its highest votes in a general election in 2003 and least in 1999.

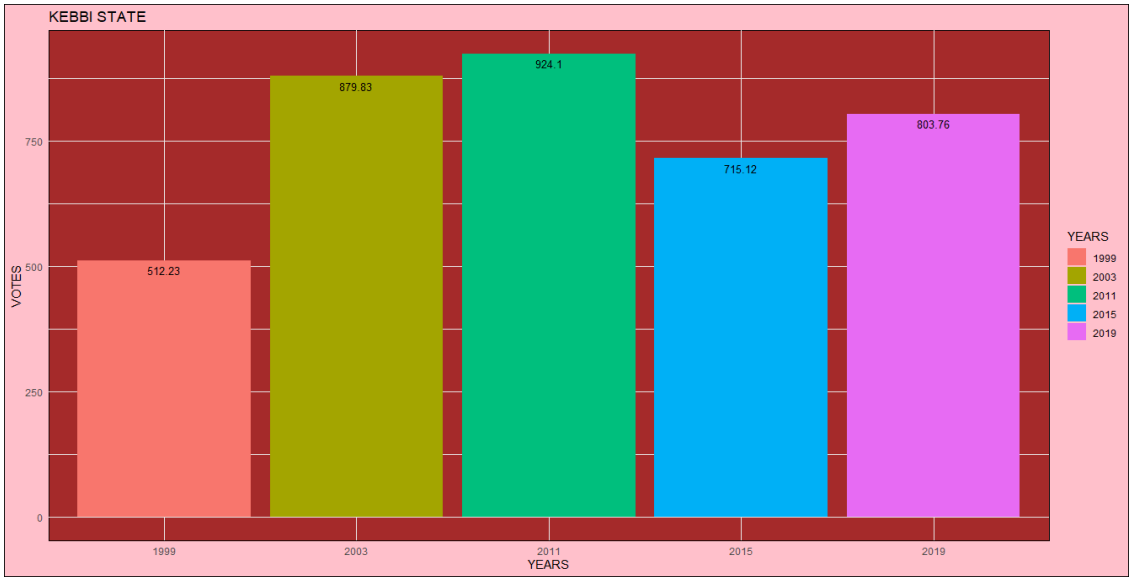

Fig 4.3.4

Kebbi state contributed its highest votes in a general election in 2011 and least in 1999.

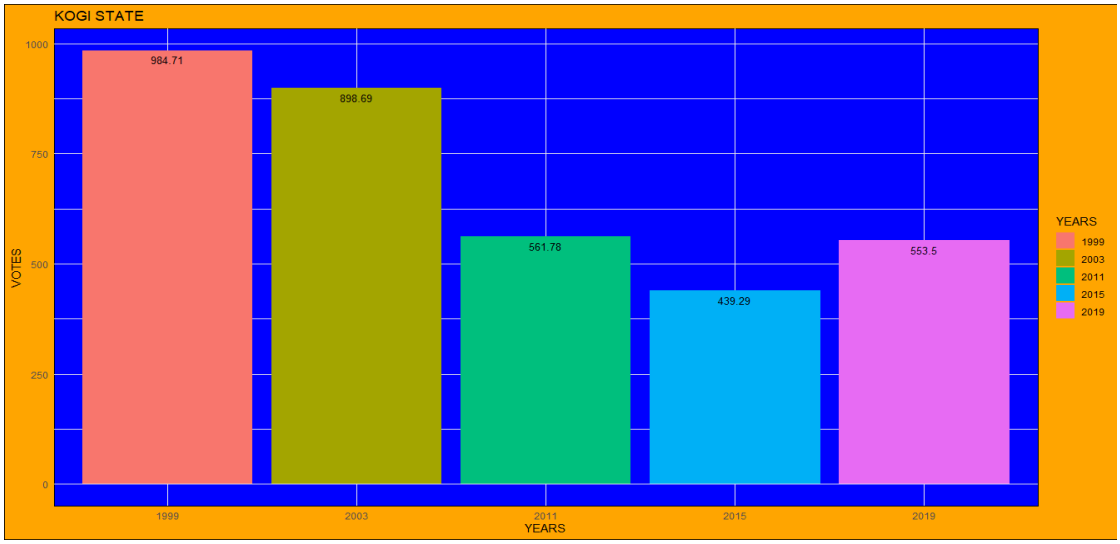

Fig 4.3.5

Kogi state contributed its highest votes in a general election in 1999 and its lowest votes in 2015.

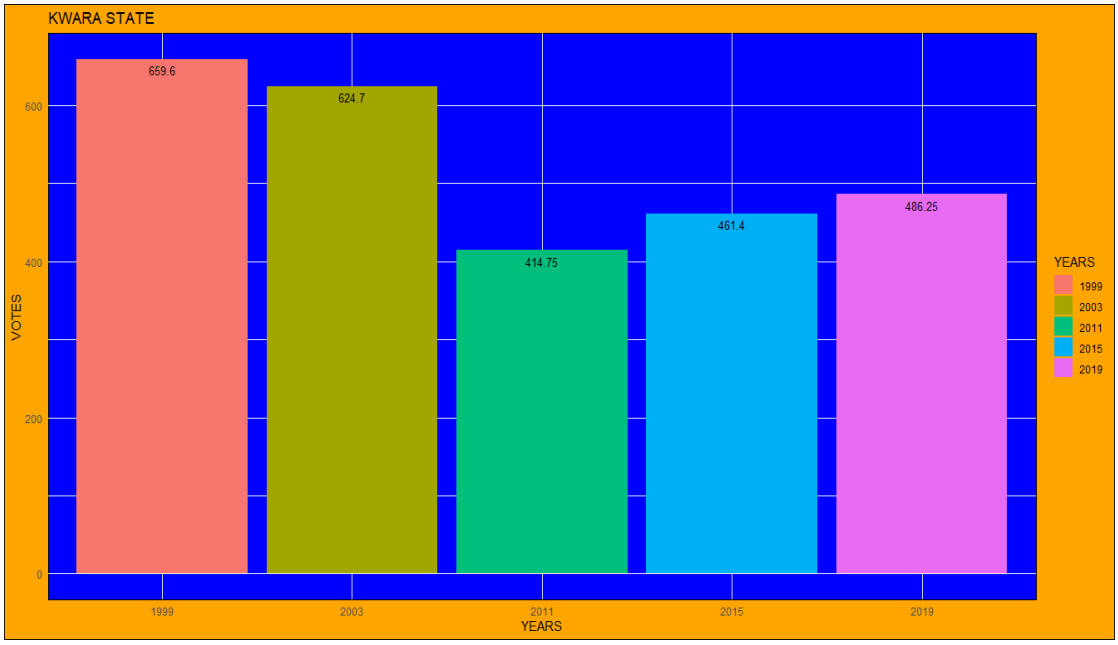

Fig 4.3.6

Kwara state contributed its highest votes in a general election in 1999 and least votes in 2011.

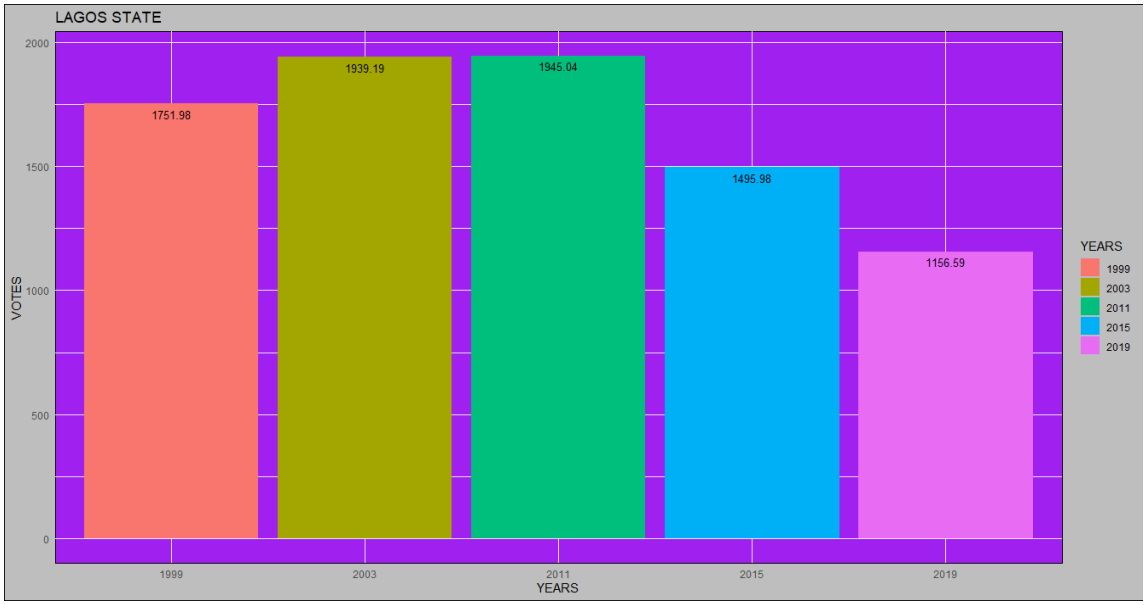

Fig 4.3.7

Lagos state had its highest votes in a general election in 2011 and the least votes in 2019.

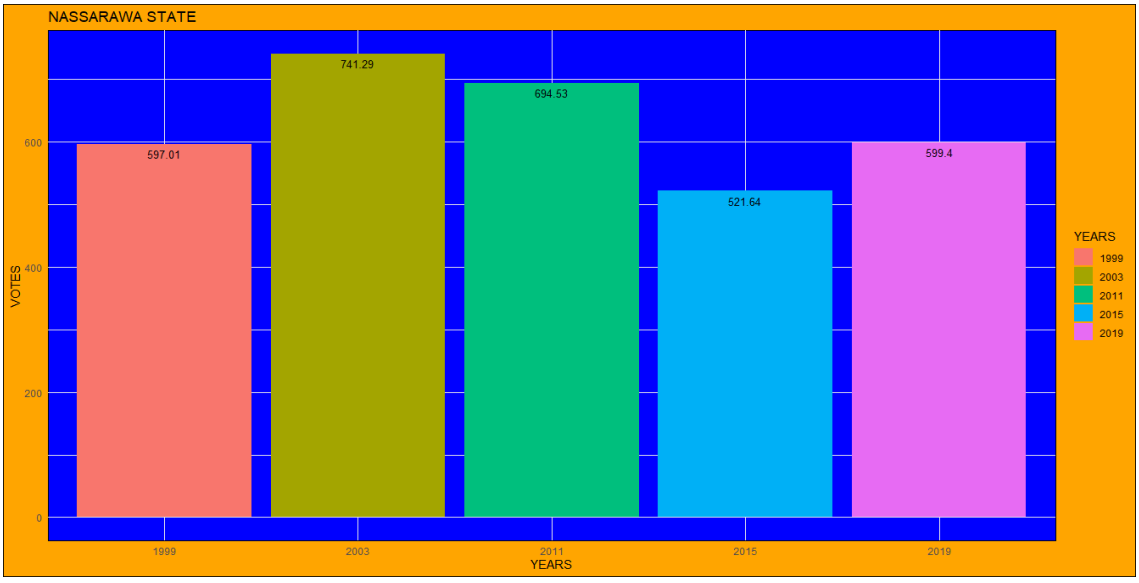

Fig 4.3.8

Nassarawa sate had its highest votes in a general election in 2003 and least votes in 2015.

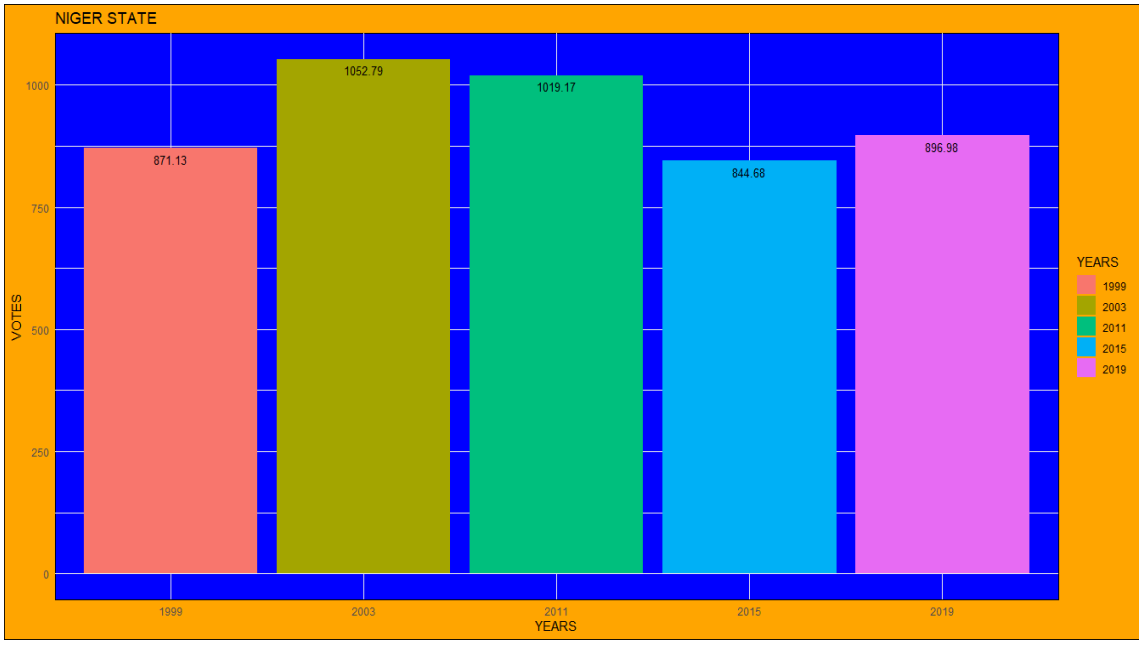

Fig 4.3.9

Niger state had its highest votes in a general election in 2003 and least in 1999.

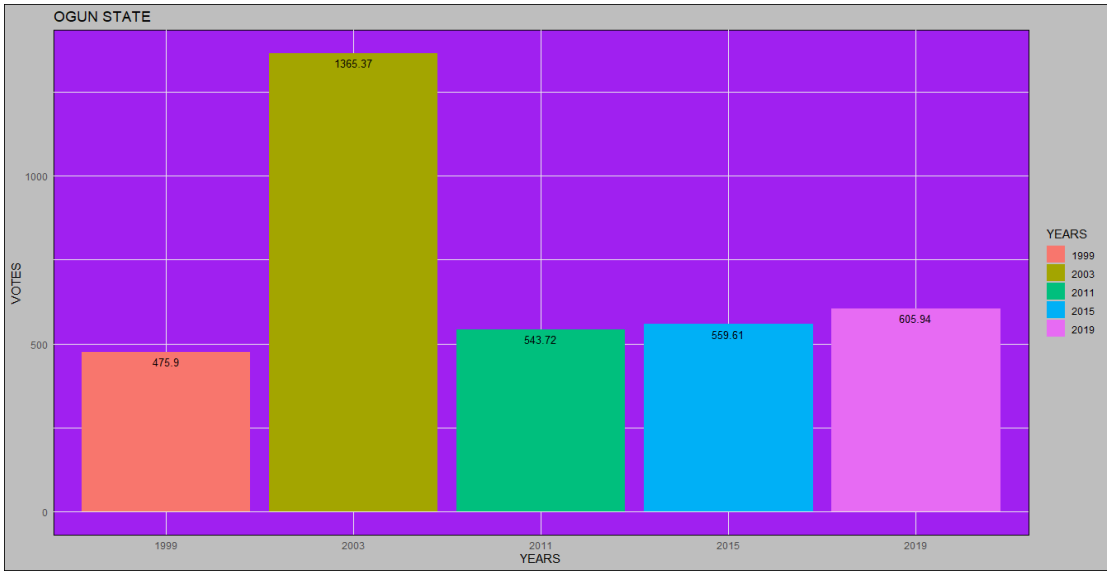

Fig 4.4.0

Ogun state had its highest votes in a general election in 2003 and least in 1999.

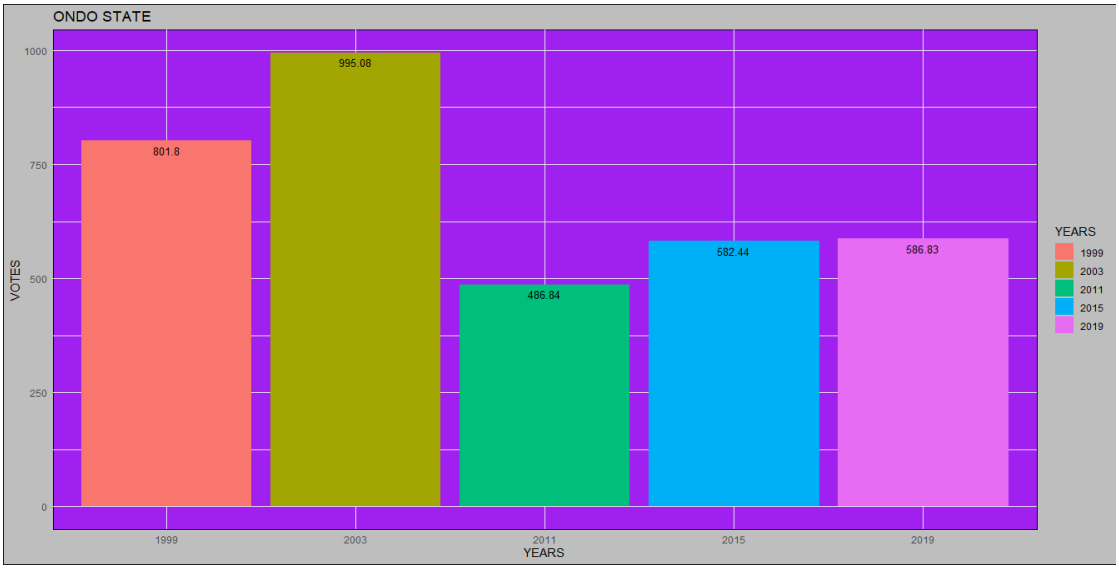

Fig 4.4.1

Ondo state contributed its highest votes in a general election in 2003 and least in 2011.

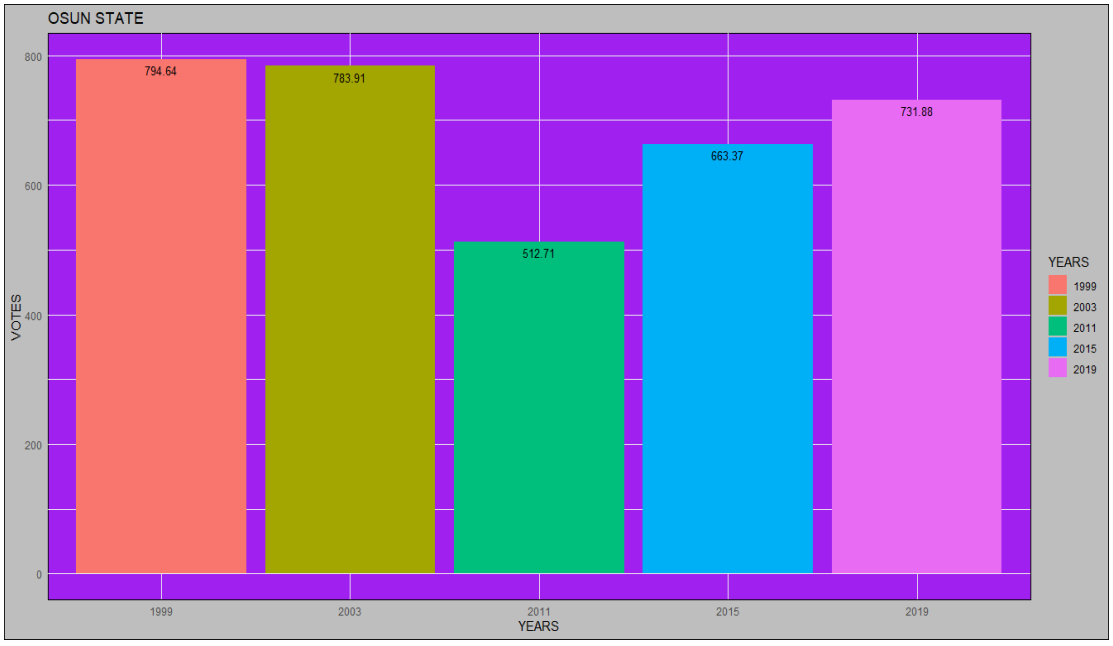

Fig 4.4.2

Osun state contributed its highest vote in 1999 and least in 2011.

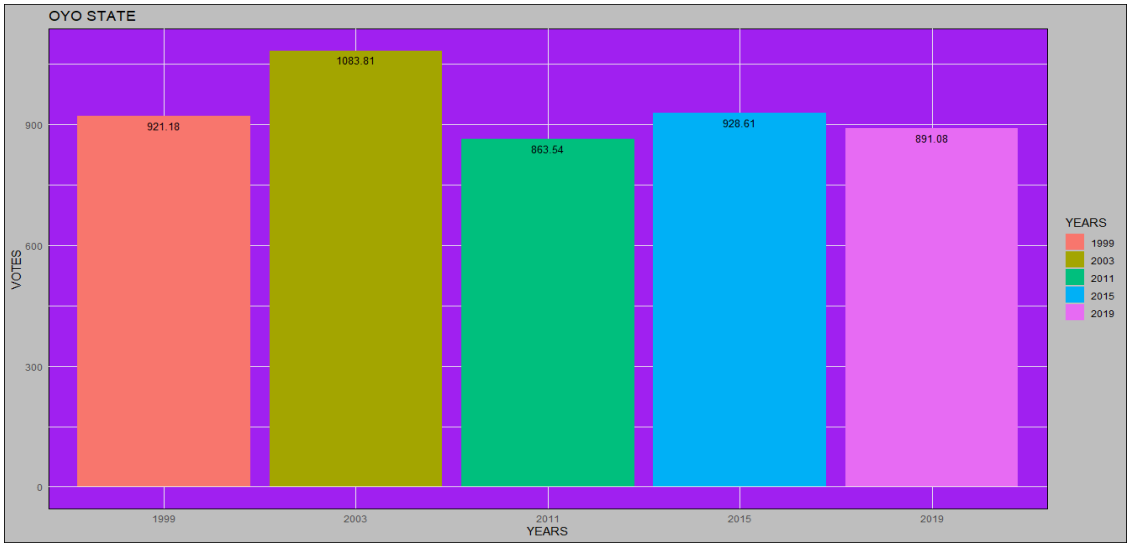

Fig 4.4.3

Oyo state had its highest vote in a general election in 2003 and least in 2011.

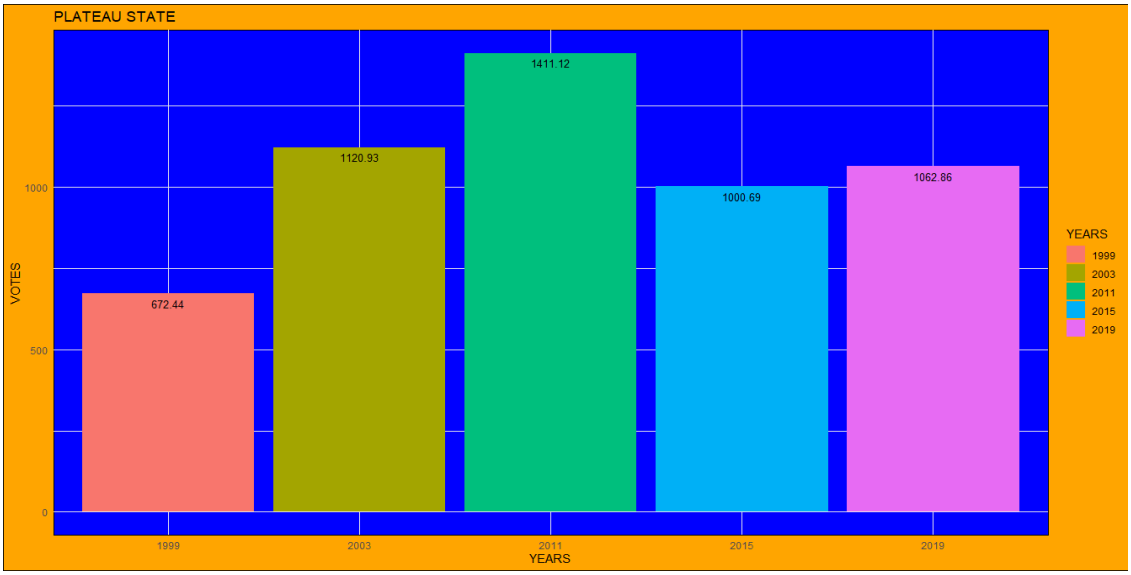

Fig 4.4.4

Plateau state had its highest vote in a general election in 2011 and least in 1999.

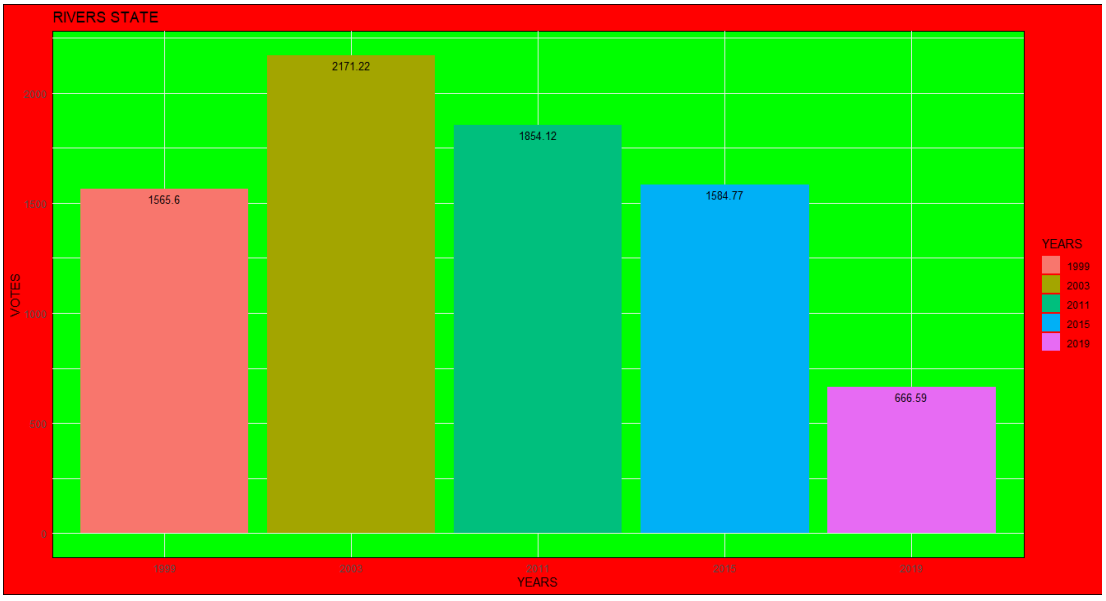

Fig 4.4.5

Rivers state had its highest vote in a general election in 2003 and least 2019

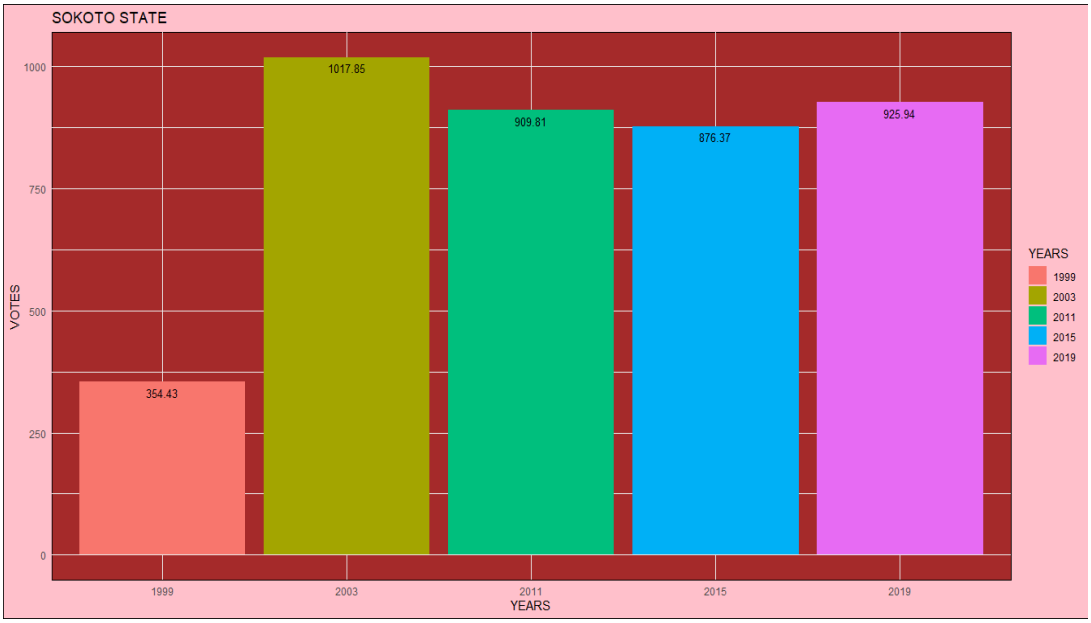

Fig 4.4.6

Sokoto had its highest vote in a general election in 2003 and least in 1999.

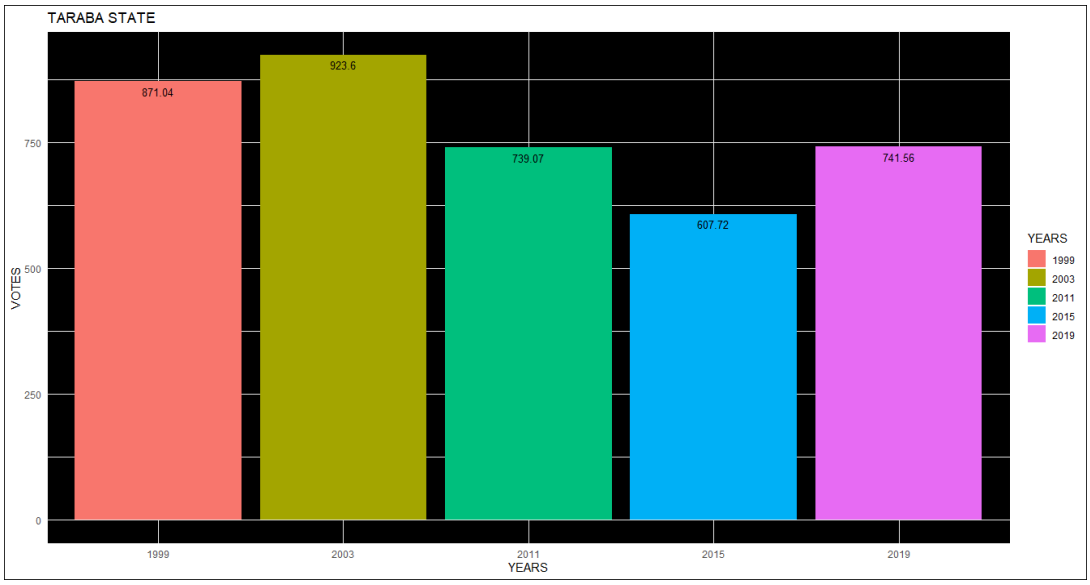

Fig 4.4.7

Taraba state had its highest vote in a general election in 2003 and least in 2015.

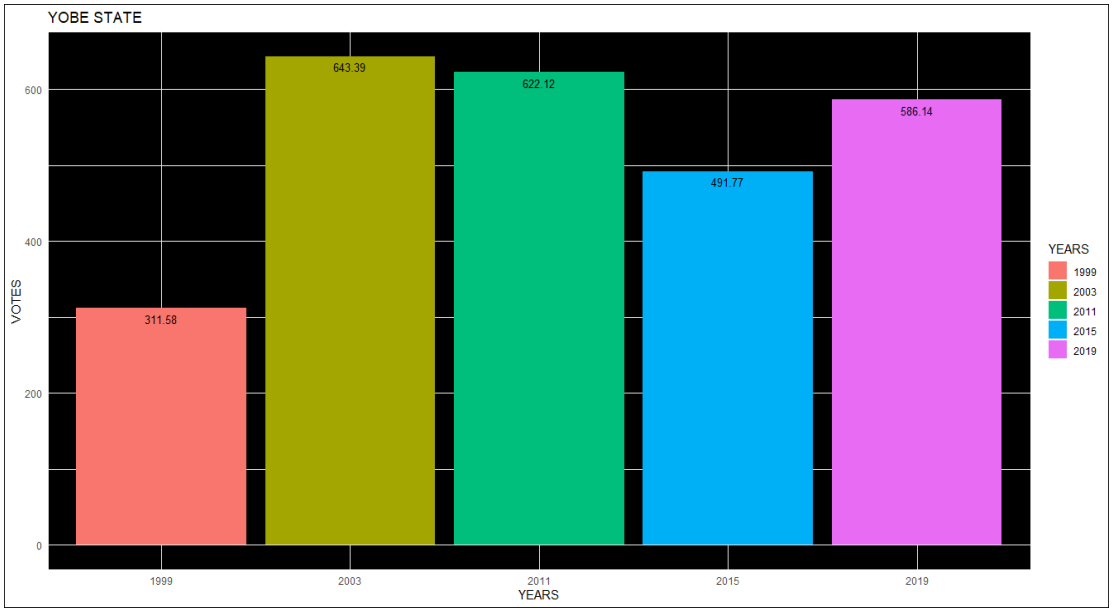

Fig 4.4.8

Yobe state had its highest votes in a general election in 2003 and its least vote in 1999.

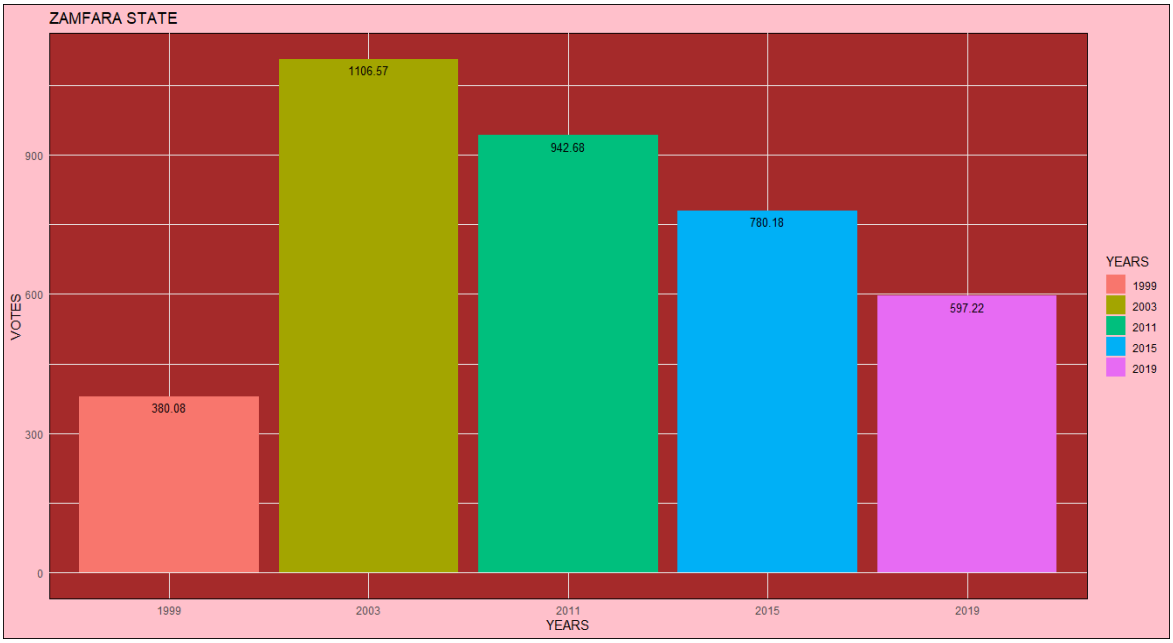

Fig 4.4.9

Zamfara state had its highest vote in 2003 and least in 1999.

4.5 Poisson and Negative Binomial Model

In this project, we are dealing with count data i.e. number of voters and two regression models will be compared in order to see which best fit the voting trends in 2019.

Let's take the number of votes per states in 2019. Predictors of number of votes are (a) political parties (PDP &APC) (b) number of registered voters.

The results using R programming language is shown below, we can see from the plots that the Poisson regression model are more spread out even the ranges of values on the y axis (standardized residuals) are too large compared to the negative binomial regression model. Since the residuals of negative binomial model are smaller, it is therefore more likely appropriate model for these set of data than Poisson model.

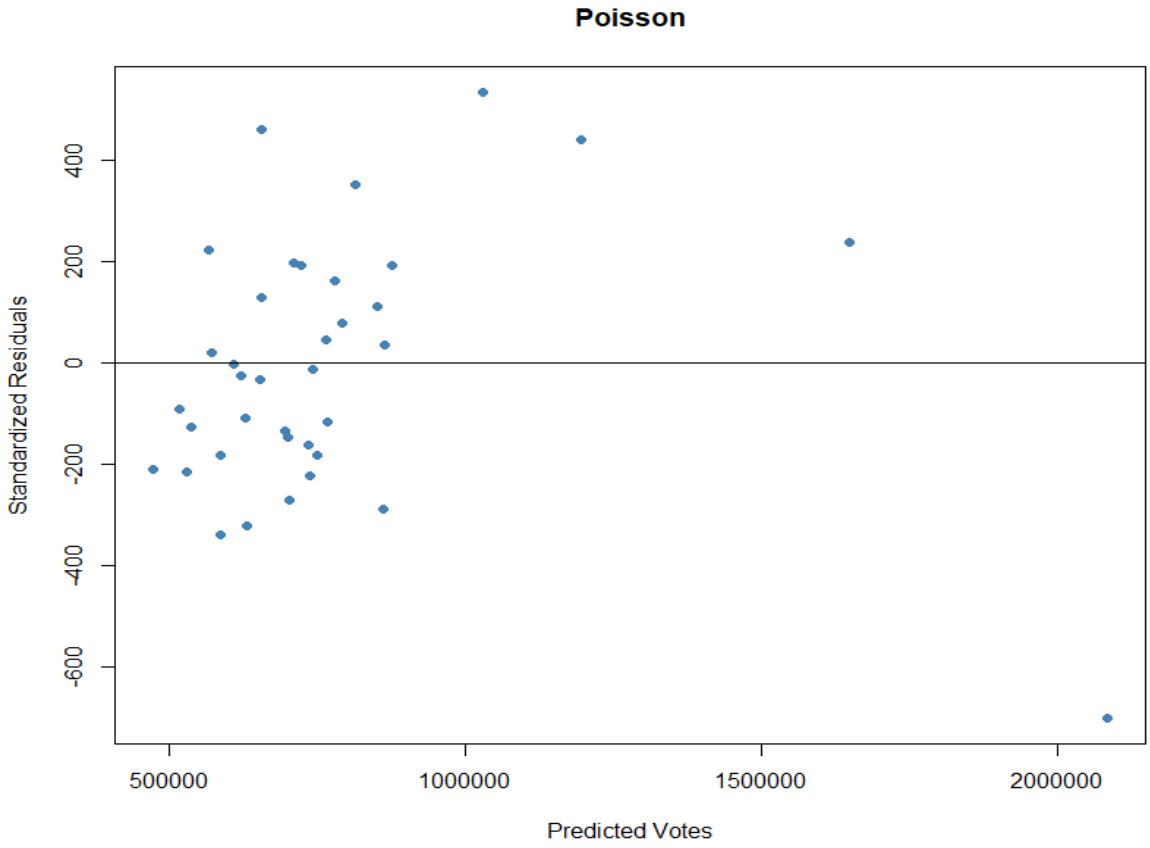

Fig 4.5.0: Poisson model

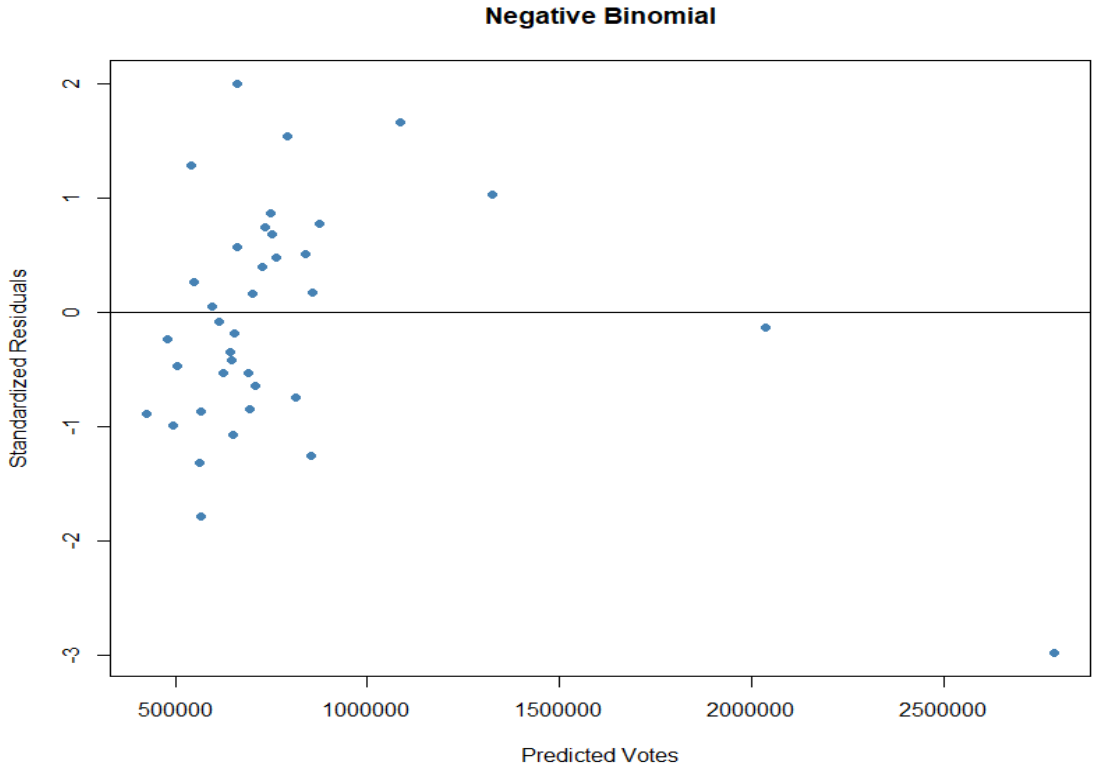

Fig 4.5.1: Negative Binomial model

The Poisson regression coefficients for each of the variables along with the standard errors, z-scores, p-values and 95% confidence intervals for the coefficients are presented in Table 2. The coefficient for registered voters is 2.113E-07. This means that the expected log count for a one-unit increase in registered voters is 2.113E-07. The indicator variable party, compares between party = "PDP" and party = "APC", the expected log count for party = "PDP" decreases by about 0.026.

Table 4.2: The Poisson Model

Coefficients	Estimate	Standard error	Z-value	Pr(>|z|)
(intercept)	1.316E+01	4.572E-04	28781.3	<2e-16 ***
PARTYPDP	-2.643E-01	3.973E-04	-665.2	<2e-16 ***
REGVOTERS	2.113E-07	1.307E-10	1616.9	<2e-16 ***

The Negative Binomial regression coefficients for each of the variables along with the standard errors, z-scores, p-values and 95% confidence intervals for the coefficients are presented in Table 3. The coefficient for registered voters is 2.2.812E-07. This means that the expected log count for a one-unit increase in registered voters is 2.812E-07. The indicator variable party, compares between party = "PDP" and party = "APC", the expected log count for party = "PDP" decreases by about 0.025.

Table 4.3: The Negative binomial Model

Coefficients	Estimate	Standard error	Z value	Pr(>|z|)
(intercept)	1.298E+01	1.151E-01	112.816	<2e-16 ***
PARTYPDP	-2.509E-01	8.832E-02	-2.841	0.0045 ***
REGVOTERS	2.812E-07	4.009E-08	7.016	2.29e-12 ***

DEVIANCE	POISSON MODEL	NEGATIVE BINOMIAL MODEL
Null Deviance	5715326	100.096
Residual Deviance	2394324	37.434

Table 4.4: Deviance Table

The null deviance of the Poisson model was 5715326 with degree of freedom 36 and residual deviance of 23494324 with degree of freedom 34, we had a significant reduction in deviance, and the residual deviance was reduced by 3321002 with a loss of two (2) degree of freedom. The null deviance of the negative binomial model was 100.096 with degree of freedom 36 and a residual of 37.433 with a degree of freedom 34, we had a significant reduction in deviance, the residual reduced by 62.662 with a loss of two (2) degree of freedom.

It is observed that all the values of the negative binomial are smaller compared to the Poisson model in the same condition, therefore, it indicates that the negative binomial model is a better model when compared to the Poisson model as regards the dataset used for this comparison.

PARAMETER	POISSON MODEL	NEGATIVE BINOMIAL MODEL
AIC(Akaike information criteria)	2394896	1012
BIC(Bayesian information criteria	2394901	1018.398

Table 4.5: AIC & BIC Table

The AIC of the Poisson model is 2394896 and the negative binomial model is 1012, which means that the negative binomial model best fit the dataset since it has a lesser value.

The BIC of the Poisson model is 2394901 and the negative binomial model is 1012, which means that the negative binomial model best fit the dataset because it has a smaller value.

4.5.1 Likelihood Test

We performed a likelihood ratio test on the 2019 result to determine if there is a statistically significant difference in the fit of the two-regression model. Our result was 2.2e^-16 which is less than 0.05, we would reject null hypothesis and conclude that the first model which is negative binomial offers a significant improvement in fit over the Poisson model.

4.5.2 Conclusion

Descriptive analysis was done on all election results gotten per election year i.e. 1999,2003,2011,2015 and 2019. Election in 2003 had the highest vote cast while 2019 had the least vote cast. Which means more than people turned out for election in 2003 than any election year so far and of all election conducted so far in the country, 2019 elections had the least turnouts of people. Though 2007 election result for each state was unavailable, the total vote cast in 2007 by electorates was higher than 2019 total votes. Most of the votes per election year are positively skewed with majority of the data values less than the mean. Also, it can be seen that the votes per election year are all leptokurtic i.e. they all have peaked distribution.

Vote cast per election year in every state were visualized, and vote cast per geopolitical zones showing votes gotten states in such region per election year, three states with the highest votes and three states with the lowest votes were listed. Each state in the country and the FCT were also visualized with their votes in all election years, the election year in which the state had a high votes and least votes were listed.

Two models (negative binomial and Poisson model) were used to check the votes in 2019 whose predictors were political parties that won each states and registered voters in each state

as released by INEC. We discovered that the negative binomial model is more appropriate for the 2019 dataset because of the following.

i. In the residual plot, we could see that the ranges of values on the Y axis of the negative binomial were lesser compared to the Poisson model
ii. The null deviance and the residual deviance of Poisson model are higher in value than the negative binomial.
iii. The AIC and BIC of the Poisson model are higher in value than the negative binomial model
iv. The likelihood test ratio test value was more than the alpha value which shows that the negative binomial offers significant improvement than the Poisson model.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATIONS

5.0 Introduction

In this chapter, conclusion was made based on the findings of the study after which recommendations was made based on the data obtained from INEC sources and other platforms.

5.1 Conclusion

Election in 2003 had the highest vote cast while 2019 had the least vote cast. Which means more than people turned out for election in 2003 than any election year so far and of all election conducted so far in the country, 2019 elections had the least turnouts of people. Though 2007 election result for each state was unavailable, the total vote cast in 2007 by electorates was higher than 2019 total votes. Most of the votes per election year are positively skewed with majority of the data values less than the mean. Also, it can be seen that the votes per election year are all leptokurtic i.e. they all have peaked distribution. Also, the negative binomial model was seen to be more appropriate and better fit than Poisson model in the 2019 election result. The residual plot, null and residual deviance, AIC, BIC (Information criteria for accessing models) were all used and they all proved that the negative binomial model is a better fit than the Poisson model.

There is no democracy without people's involvement, if the people are not involved in the process to determine who governs them then a lot needs to be done to change such narrative. Many factors affect the participation of electorates in the electoral process, some of which have been highlighted in the literature review. Highlighted below are some of the reasons why voter's turnout remains low after six (6) election rounds

i. Insecurities such ballot snatching, violence, banditry and insurgency before election and on election day affects turnouts of voters
ii. Lack of voter's orientation, education and sensitization affects voter's turnout and number of valid votes in an election
iii. Lack of trust in the electoral body affects turnouts on election day
iv. Lack of independence of the electoral body and infiltration of the government in power affects the voter's trend in an election
v. Failure of government to fulfil campaign promises after being elected affect election turnouts
vi. Lack of funds affects the preparations and plans of the electoral body. Etc.

The project has shown the trends of voters in all general election, the turnout by states and geopolitical zones were visualized to show their participation level in elections.

5.2 Recommendation

This project visualizes trends of voters in general election and so many reasons have been highlighted as the cause of the continuous disparity in number of registered voters, number of accredited voters and number of valid votes. The following recommendations are suggested in light of the foregoing problems of voter's trends in general election as it touches the government, the governed and the electoral body.

i. Funds should be made available to the electoral body (INEC) as at when due so that they can make plans and preparation for elections
ii. INEC should be seen to be independent of government in power, this will help build trust of electorates in the electioneering

iii. As much as possible security agencies should be made available on Election Day and at election stations, they should also be positioned strategically in high risk areas to curb any form of violence or irregularities.

iv. The government in power should fulfil all their campaign promises, it helps the electorates to exercise their civic rights most especially during elections

v. The government in power should be seen to uphold laws in the constitution and act accordingly to judgments made by the judiciary, it helps to build the democratic process and alleviate people of fears of the government.

vi. Electorates should be sensitized on need to vote properly to reduce number of invalid votes

vii. Electorates should be educated and sensitized about the importance of voting since the choice they make on Election Day affects their future.

viii. Proper leadership counselling should be held by INEC or other social groups for all candidates vying for positions in government

ix. Incentives should be made available in communities where young and old are indigent so that they can perform their civic responsibilities e.g. riverine areas, villages and huts

x. Manifestos, promises, programs and plans of candidates should be checked and questioned through national debates

xi. Political parties should present people with integrity, capacity and competency as candidates not those picked for their selfish interests

xii. Candidates to be voted for should be seen to be of good character, without blemish, and no past records of corruption or fraudulent practices.

xiii. The media (radio, television, podcasts, satellites and social media) should be used to propagate peace and unity amidst the people before, on and after elections.

xiv. Religious leaders should help preach and admonish their members to sue for peace, go out en -masse to perform their civic responsibility on election day and avoid any form of violence throughout electioneering

xv. Electoral process should be seen to be transparent, also free and fair for all.

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