STA 204

Term paper

Title:

DISTRIBUTION OF SOLID MINERALS IN NIGERIA

INTRODUCTION

A mineral is a naturally occurring substance that is solid and inorganic, representable by a chemical formula, usually abiogenic and has an ordered atomic structure.

Solid Mineral resources are the result of mineral and organic formations in the earth's crust creation over millions of years starting with the first sources of the Earth's origin. Solid minerals are therefore minerals that are entirely crystalline solid unlike those that are crystalline liquid.

The availability of solid minerals contributed immensely to the economic development of Nigeria in the pre-independence years. During this period, Nigeria was known for the production of coal as an energy source for electricity, railways, and also for export. Tin, Columbite, Lead, and Zinc were also exported and Nigeria was the largest producer of Columbite at a point in time. The earnings from solid minerals were used to develop roads, education, hospitals, and develop the petroleum industry.

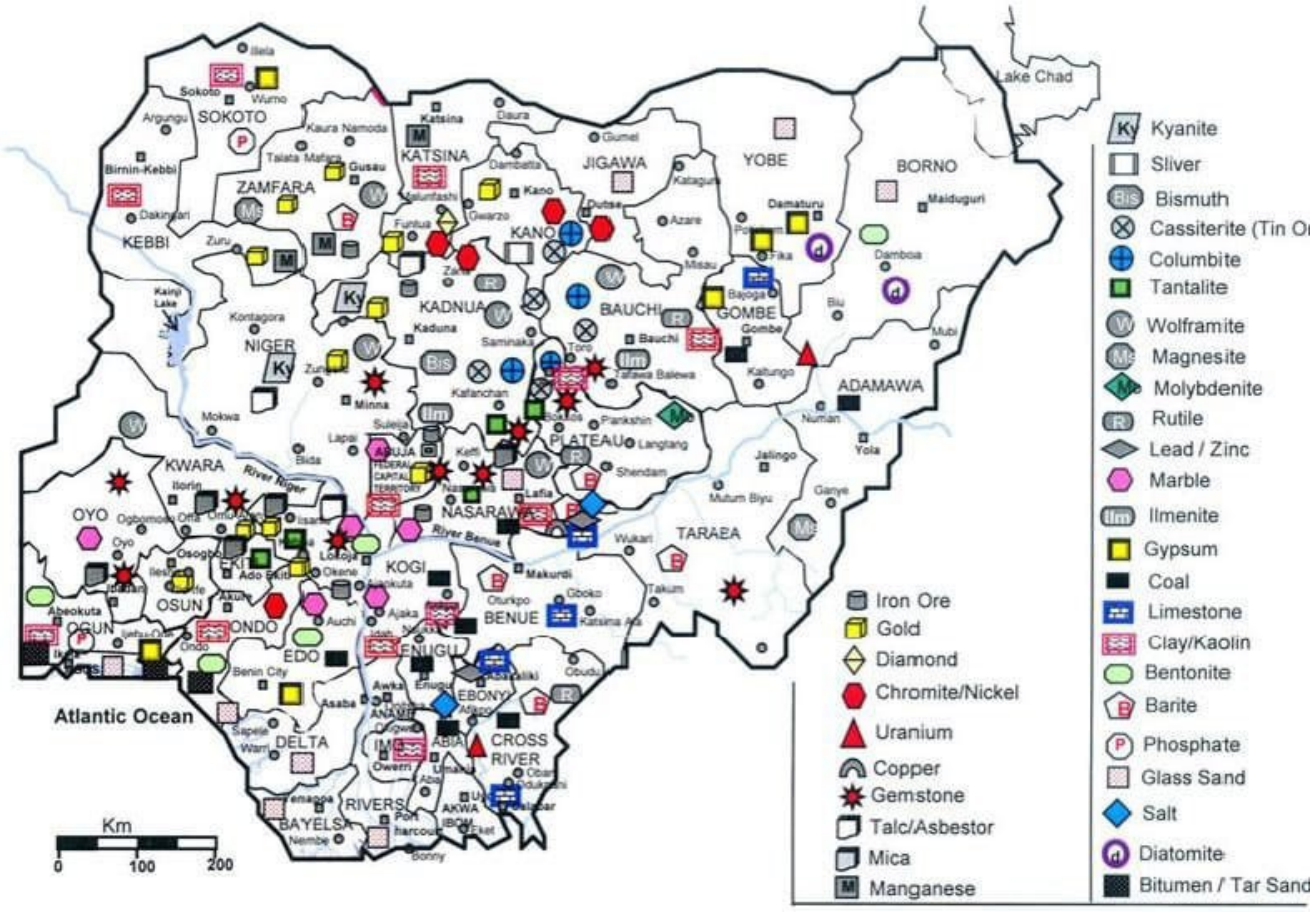
Nigeria as a nation is blessed with abundant solid mineral resources distributed fairly in all the states of the federation According to reports by the Geological Survey of Nigeria Agency, Nigeria has some 34 known major mineral deposits distributed in locations across the country and offers considerable attraction for investors. Exploration in Nigeria for several solid minerals, e.g. tin, niobium, lead, zinc and gold, goes back for more than 90 years but only tin and niobium production have ranked on a world-wide scale.

The Nigerian Extractive Industry and Transparency Initiative, NEITI report suggests that there are over 30 different kinds of solid minerals and precious metals (Sapphire, Aquamarine, Topaz etc.) buried in Nigerian soil waiting to be exploited.

The decline of the solid minerals industry started with the discovery of oil to an extent that

Nigeria became a mono product economy and vulnerable to international oil politics.
The neglect of the minerals in the industry led to disorder in the minefield with a strong presence of illegal miners whose activities are characterised by inefficient mining, illegal trading of highly priced minerals, severe ecological degradation, diseases, and huge loss of revenue to the government through smuggling.

An established and well managed solid minerals sub-sector will accelerate the economic, social, and political growth of Nigeria by the provision of gainful employment well-managed in national income earnings far exceeding the petroleum sector .Solid minerals can provide the all-important launching pad for the development of other sectors of the economy as well as give sense and meaning to the oneness of the Assyrian state as minerals are located in all states of the Federation.



AIM AND OBJECTIVES

Aim

The aim of the project is to analyse the distribution of solid minerals across Nigeria.

Objectives

1. To analyze solid mineral distribution per state, their quantity in tonnes and their values in Naira.
2. To analyze the total value of minerals, the quantity produced and their value per tonne for the six geopolitical zones of Nigeria.
3. To examine if the availability of solid minerals in Nigeria is associated with the National GDP of Nigeria
4. To examine if the availability of solid minerals in Nigeria is associated with the total revenue generated in Nigeria.

METHODOLOGY

The research was conducted on the statistical analysis of distribution of solid minerals in Nigeria .

Our data was collected, organized and tabulated using various sources such as the annual NEITI transparency reports, collected statistical data from Nigeria bureau of statistics and Nigerian Geological Survey Agency (NGSA) for more information about our topic.

Analysis of the data we collected, organized and tabulated, was done using different methods such as:

- Bar charts and pie charts to examine the distribution of solid minerals in Nigeria
- Point plots to analyze the relationship between some of the variables such as quantity of mineral resources produced in tons, the national GDP, the revenue generated etc.
- Regression plot and Pearson's correlation coefficient to verify the correlation between some of our variables.

The tools we used for the research and analysis were Excel and libraries of python programming language such as: Pandas, Matplotlib, Seaborn and Scipy (via jupyter notebook).

We avoided research biases by the following methods:

- Verifying with multiple data sources
- Having multiple group members collate and combine data.
- Having our group members review the results obtained

The methods chosen for collecting, organising, tabulating, analysing and visual display was to give a comprehensive, but easy to breakdown statistical data of our topic and to showcase our understanding of our topic given.

DESCRIPTION OF DATA SETS, STATISTICAL REPRESENTATIONS WITH ANALYSIS

DESCRIPTION OF DATASETS

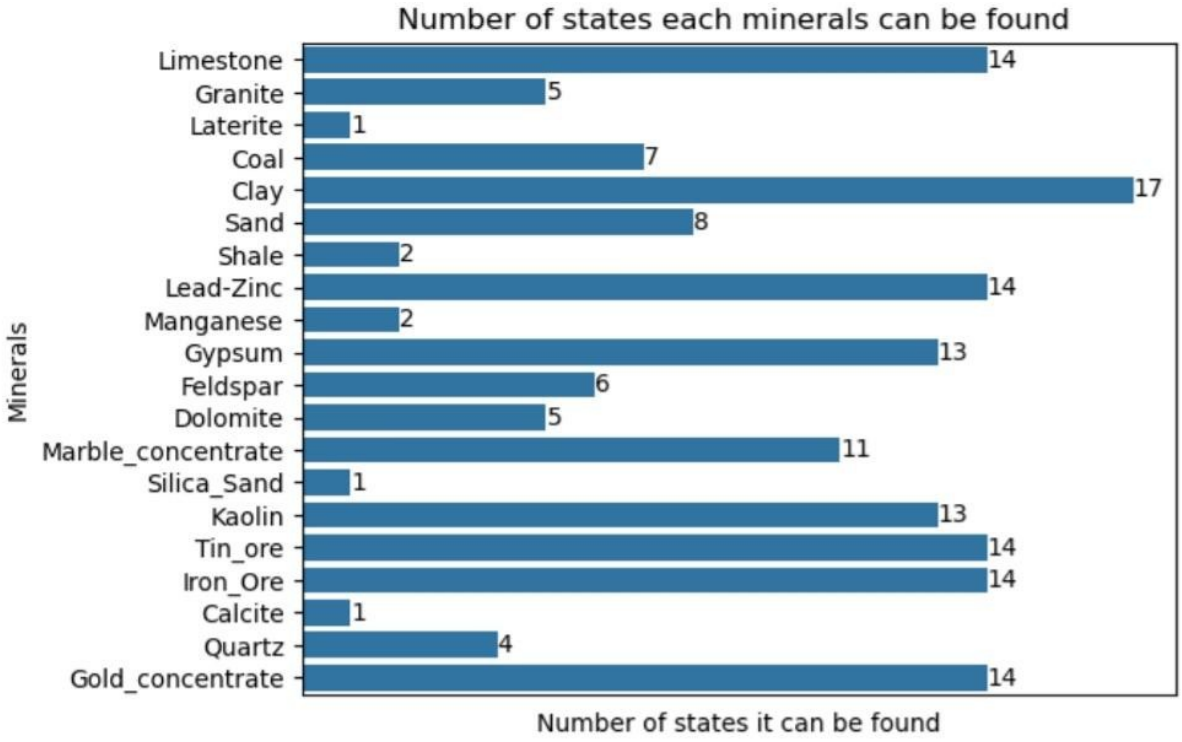
Dataset 1- It analyses the solid minerals with respect to the number of producing states,the quantity of their production in tonnes and their total value in millions of naira.

Dataset 2- It analyzes the production per state, their respective values in millions of naira.

Dataset 3- It groups the production per year and analyses the revenue in billions of naira relating to national GDP in billions of naira.

STATISTICAL REPRESENTATIONS WITH ANALYSIS

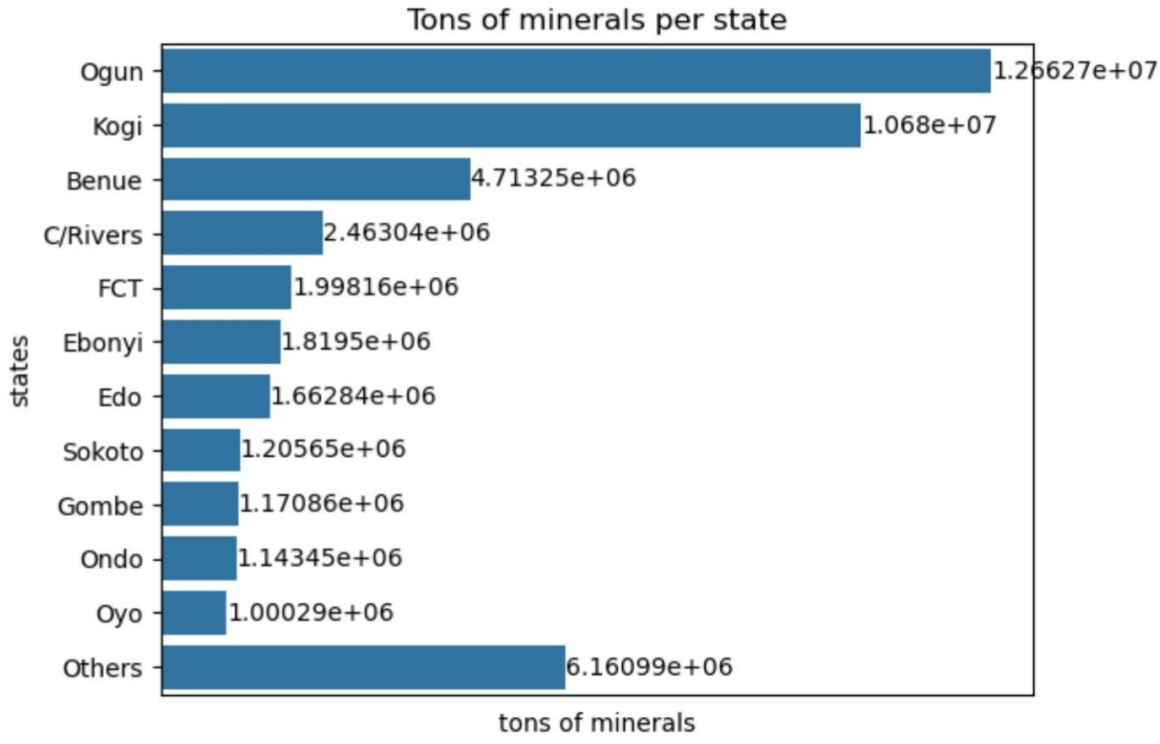
The Nigerian Extractive Industry and Transparency Initiative, NEITI report suggest that there are over 30 different kinds of solid minerals from which we extracted the data set below;

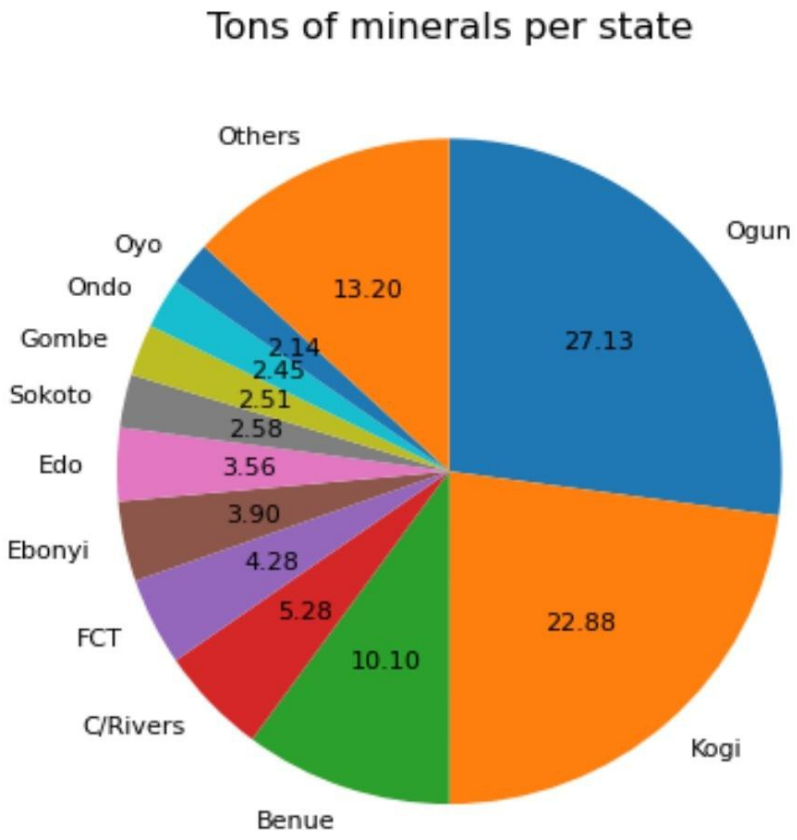


In Nigeria, clay can be produced in 17 states, limestone, kaolin, Tin-ore, lead-zinc ore, iron-ore and gold concentrate can be found in 14 states.

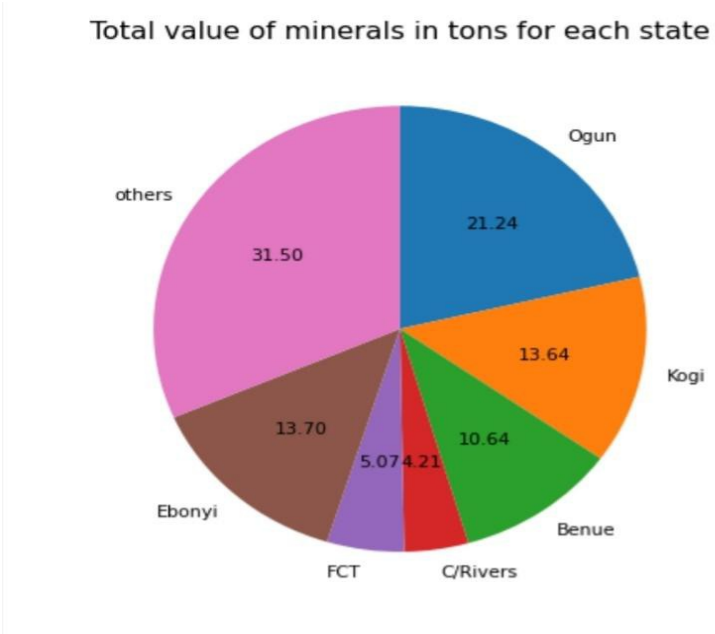
Limestone is the most produced minerals in quantity in Nigeria, followed by the likes of granite, laterite, sand, lead/zinc ore, clay, coal and shale.

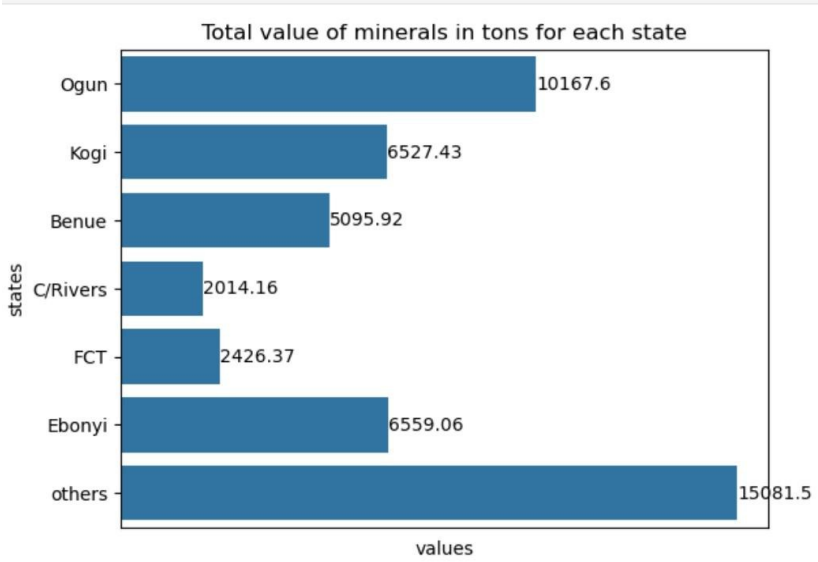
ed: 0	State	Production(Tons)	Value_of_minerals(millions_of_Naria)	Contribution_to_production	Region
0	Ogun	12662663.86	10167.605068	27.13	South-west
1	Kogi	10679964.37	6527.431003	22.88	North-central
2	Benue	4713247.84	5095.915080	10.10	North-central
3	C/Rivers	2463035.66	2014.163464	5.28	South-south
4	FCT	1998157.15	2426.369030	4.28	North-central
5	Ebonyi	1819501.57	6559.057231	3.90	South-east
6	Edo	1662844.64	1367.206005	3.56	South-south
7	Sokoto	1205645.18	722.470144	2.58	North-west
8	Gombe	1170856.95	1204.773858	2.51	North-east
9	Ondo	1143454.45	1661.724970	2.45	South-west
10	Oyo	1000294.80	1405.373350	2.14	South-west
11	Akwa_Ibom	814261.00	488.556600	1.74	South-south
12	Kano	699104.00	762.309199	1.50	North-west
13	Katsina	673722.06	481.290511	1.44	North-west
14	Bauchi	662392.05	882.459711	1.42	North-east
15	Lagos	508199.30	406.559440	1.09	South-west
16	Abia	478999.65	637.255564	1.03	South-east
17	Zamfara	427911.92	497.810363	0.92	North-west
18	Anambra	255451.09	192.149447	0.55	South-east
19	Delta	243508.35	185.840413	0.52	South-south
20	Jigawa	194878.21	274.317315	0.42	North-west
21	Kaduna	188373.32	274.052581	0.40	North-central
22	Nasarawa	146395.60	378.110235	0.31	North-central
23	Niger	139885.46	253.317606	0.30	North-central
24	Osun	124828.16	188.808163	0.27	South-west
25	Ekiti	100181.87	127.600010	0.21	South-west
26	Kwara	99903.28	144.104829	0.21	North-central
27	Adamawa	87373.60	89.446497	0.19	North-east
28	Plateau	72468.86	1716.112540	0.16	North-central
29	Kebbi	66110.30	576.215372	0.14	North-west
30	Taraba	58266.74	65.727910	0.12	North-east
31	Rivers	49090.30	39.272240	0.10	South-south
32	Imo	36500.00	29.200000	0.08	South-east
33	Yobe	17086.65	16.529989	0.04	North-east
34	Enugu	9125.00	7.300000	0.02	South-east
35	Borno	6975.00	5.580000	0.01	North-east
36	Bayelsa	NaN	NaN	NaN	South-south





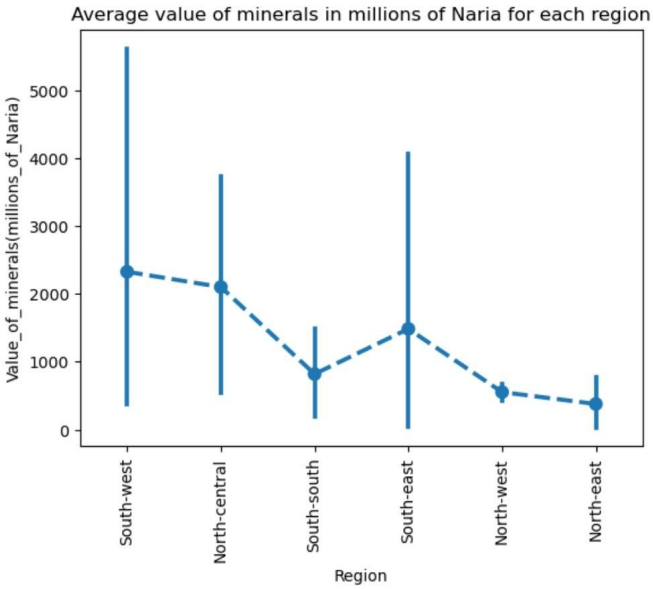
Half the quantity of solid minerals produced in Nigeria are produced in Ogun state and kogi state alone. Benue, Cross river, The FCT, Ebonyi, Edo , Sokoto, Gombe, Ondo and Oyo produces a relatively high quantity of Solid minerals compared to other states.



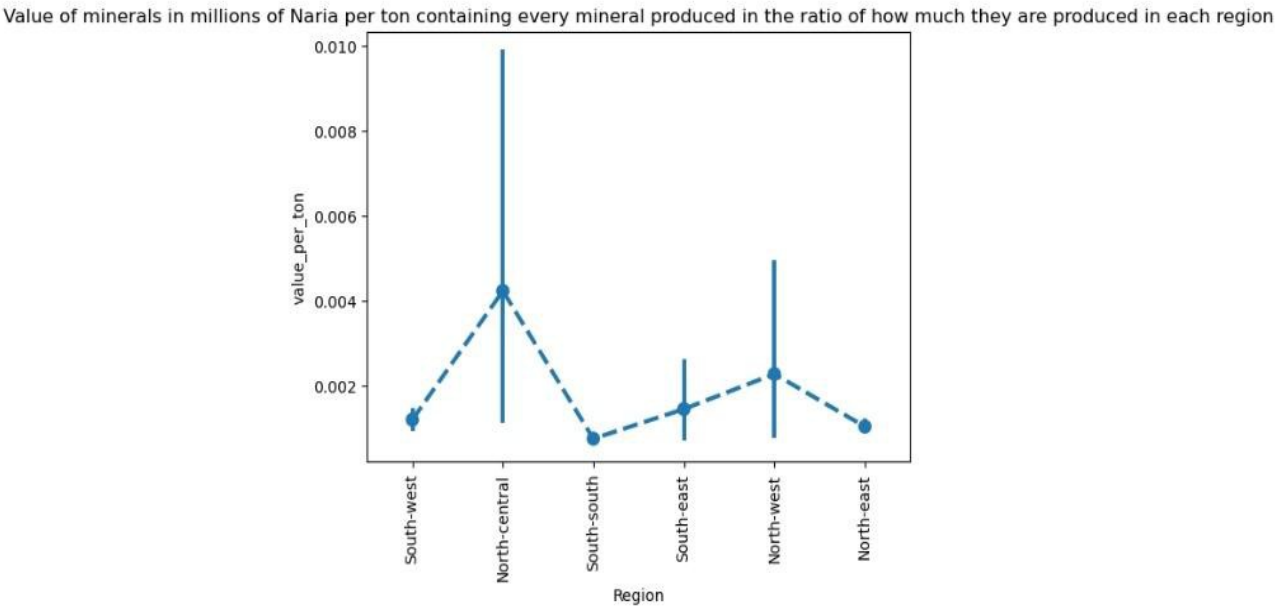


21.24% of the value of solid minerals in Nigeria comes from Ogun state. 13.64 percent from Kogi state and 10.64% from Benue state.

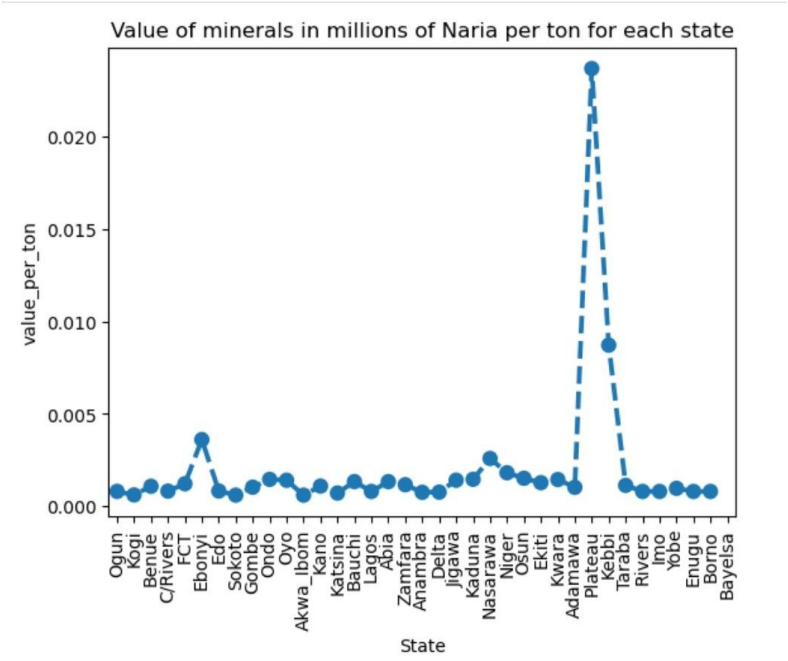
Region	Unnamed: 0	Production(Tons)	Value_of_minerals(millions_of_Naria)	Contribution_to_production
North-central	15.875000	2.254799e+06	2101.926613	4.830000
North-east	24.500000	3.338252e+05	377.419661	0.715000
North-west	16.333333	5.445619e+05	552.402151	1.166667
South-east	21.000000	5.199155e+05	1484.992448	1.116000
South-south	17.666667	1.046548e+06	819.007744	2.240000
South-west	13.833333	2.589937e+06	2326.278500	5.548333



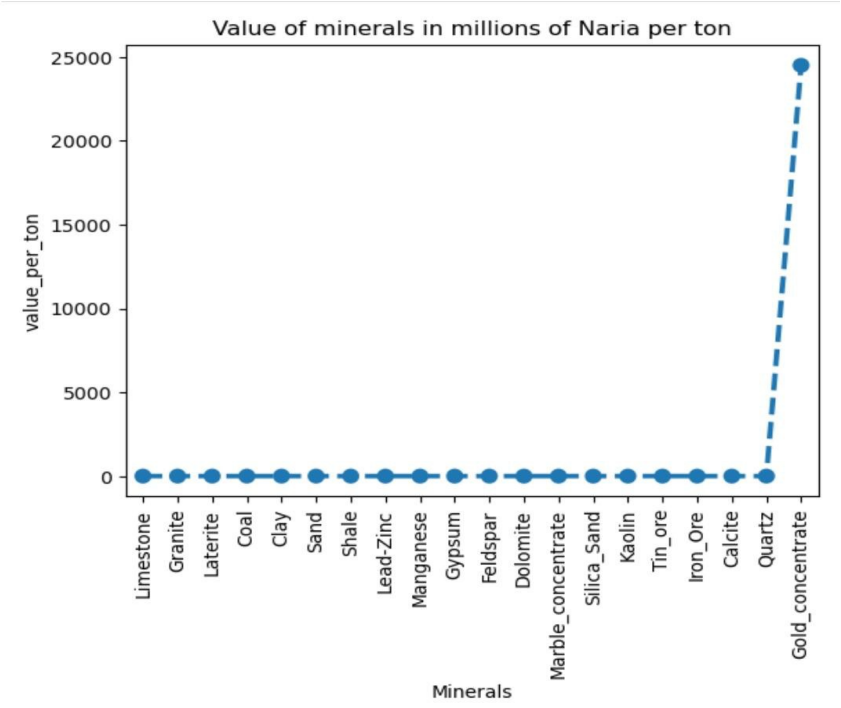
States in the South western region of Nigeria generates the highest value of solid minerals in millions of Naria, while the North east generates the lowest values in millions of Nigeria.

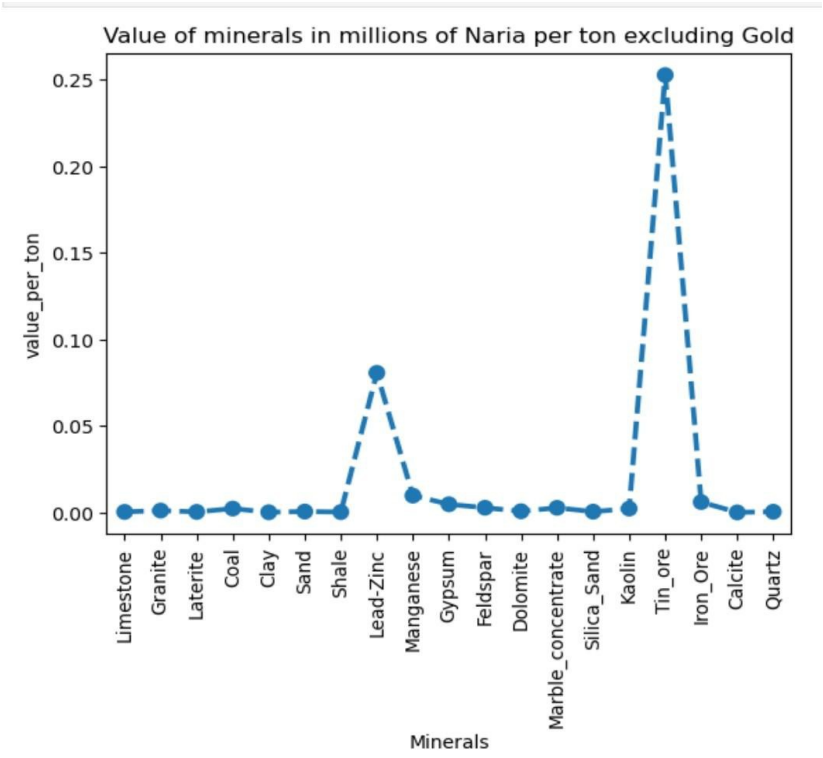


Despite the fact that the South west has the highest value of mineral in total, the value per ton for that region is one of the lowest. The North central with a relatively low value in total, has the highest value per ton. This shows that the south west produces minerals in large quantitties, but most of the minerals produced are of low value. Minerals produced in the south east and the north east are also low values, with the North central states with minerals of very high value.

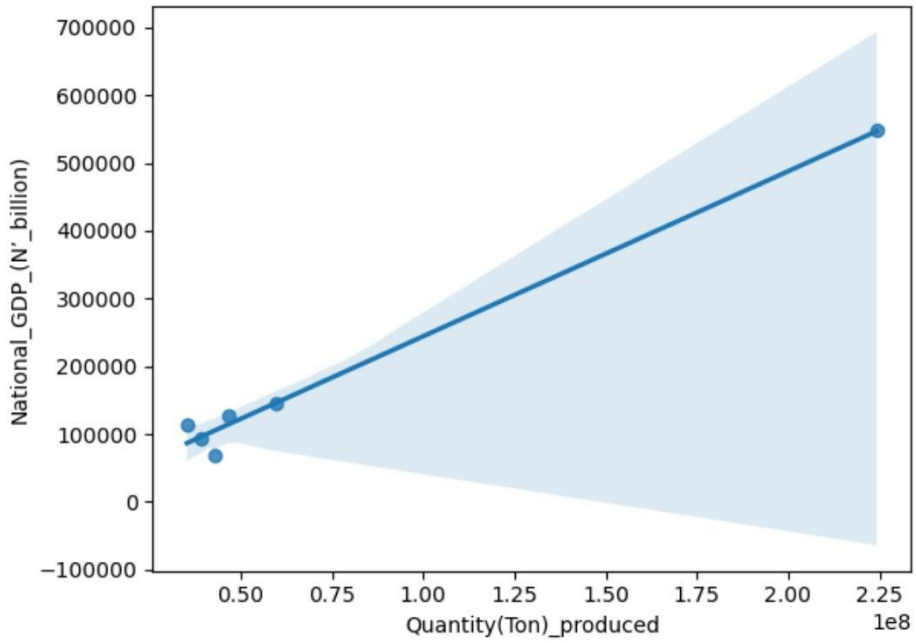


States in the North such as Plateau, Kebbi and Nassarawa has minerals with higher value per ton. This supports the very high value of minerals in the North central part of the Nation.



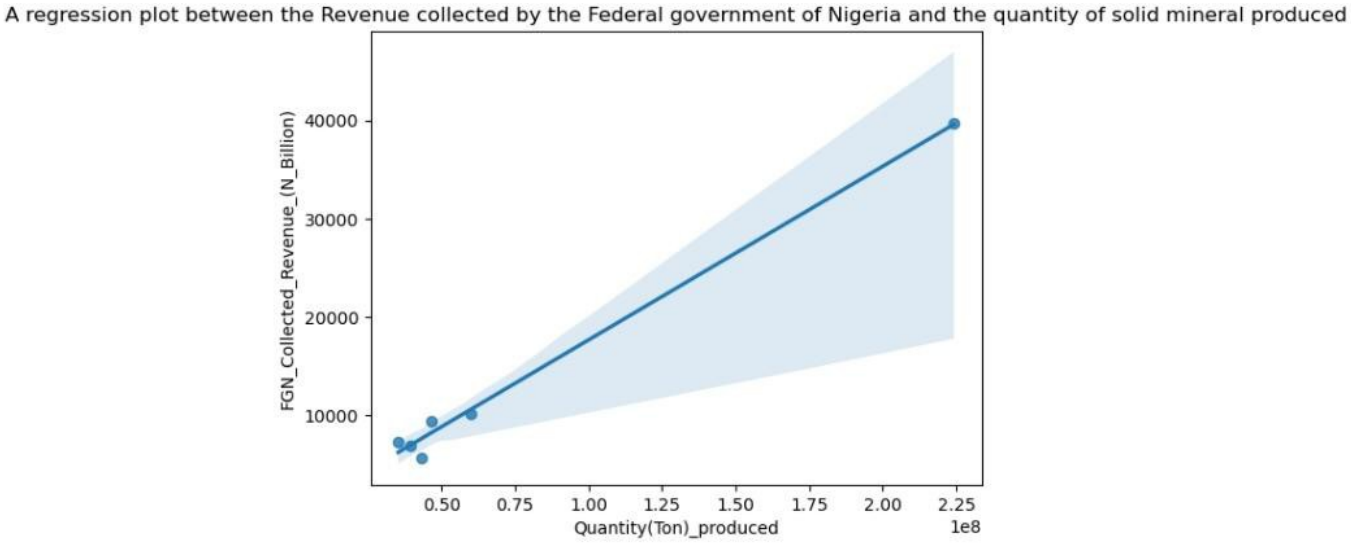


The value of gold concentrate is very high compared to other mineral reources in Nigeria. Tin ore and lead-zinc are also valuable, but are still incomparable in value to gold.



This regression plot indicates that there is a positive correlation between the National GDP of Nigeria in billions of Naira and the quantity of solid mineral produced in Nigeria. This shows that as the quantity of solid minerals extracted from Nigeria increases, there is also an increase in the National GDP of Nigeria in billions of Naira.

The Pearson correlation coefficient between the quantity of solid minerals and the revenue generated by the Federal government is 0.60. This indicates a strong positive correlation between the two variables.



This regression plot indicates that there is a positive correlation between the Revenue collected by the Federal government of Nigeria and the quantity of solid mineral produced in Nigeria. This shows that as the quantity of solid minerals extracted from Nigeria increases, there is also an increase in the Revenue generated by the Federal government. The pearson correlation coefficient between the quantity of solid minerals and the revenue generated by the Federal government is 0.74. This indicates a strong positive correlation between the two variables.

CONCLUSION

According to the report, Nigeria has a rich mineral endowment, with over 30 solid minerals available. The distribution of solid minerals is not even across the 37 states in the country. Ogun state and Kogi state produce over 50% in quantity and 35% in value of the solid minerals in Nigeria.

The Southwest, southeast and the north central region of the country generates the highest value of solid minerals in the country. This can be supported by the fact that Plateau state has the most valuable kinds of minerals in the country.

Furthermore, the group investigates if the abundance of solid minerals is related to total revenue earned in Nigeria.The methodology focuses on the distribution of solid minerals in Nigeria.

The analysis conducted shows that there is a positive relationship between the country's GDP and the amount of minerals produced. Thus, the solid mineral sector contributes positively to the nation's GDP.

Despite the richness of these resources, Nigeria has struggled to fully capitalise on its robust mineral endowment. This can be attributed to a lack of infrastructure and investment in the sector, as well as corruption and mismanagement. However, the government has recently made attempts to restructure the sector and encourage international investment, which could help Nigeria's solid minerals reach their full potential.

REFERENCES

1.**NEITI ANNUAL REPORT RECORDS** for 2015 - 2019

2.NIGERIAN GELOGICAL SURVEY AGENCY