GRADIVA

Volume 64 | Issue 07 | July 2025
DOI: 10.5281/zenodo.16627486

Pattern And Determinants of Agro-Processing SMEs Location in Nsukka LGA, Enugu State, Nigeria

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Abstract

The study examined the pattern of distribution and location determinants of agro-processing Small and Medium scale Enterprises location in Nsukka Local Government Area. Agro-processing SMEs are important for job creation, achieving food security, agricultural sustainability and value chain in developing economies. To achieve the aim of this study, data were collected from field observation, questionnaire and documentary materials. Data collected were analyzed using Frequencies, percentages Nearest Neighbour Analysis (NNA), Principal Component Analysis (PCA) and Relative Importance Index (RII). NNA revealed that the agro processing SMEs were clustered in their distribution. PCA revealed that the likelihood for clustering and development of agro processing SMEs in the different communities are influenced by five components which include cost and accessibility to production infrastructure, Machine and raw material inputs, Environmental factors, economic factors and personal factors. The Relative Importance Index revealed that proximity to markets with RII of 0.885(88.5%) and closeness to residential areas with RII of 0.873(87.3%) were the influential determinants in the location and distribution pattern of agro-processing SMEs in Nsukka LGA. Appropriate recommendation based on the findings was made namely Development of cluster programs- Government through Public-Private partnership arrangement should provide land in close proximity to residential areas, markets and farm lands for location of agro processing SMEs.

Keywords: *Spatial Distribution, Location Factors, Agro-Processing, Small and Medium Scale Enterprises, Nsukka LGA, Enugu State, Nigeria.*

INTRODUCTION

Agro processing industries accounts for more than 50% of total manufacturing value added in the Least Industrialized countries, declining to 36% and 32% for LMICs and UMICs respectively (Wilkinson and Rocha, 2008). An agro industry is one which specializes in the processing of agricultural products (Ogunleye, Ojedokun and Adebisi, 2018). Agro-based industries may be classified into two categories namely food processing industries and nonfood processing industries. Food processing industries mainly deal with the preservation of perishable products while nonfood processing industries involves products that are not edible such as timber, leathet etc. Also, the agro-processing sector may be classified into domestic processing and factory processing (Quartey and Darkwah 2015).

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Agro-processors are important to economies of developing countries as they help create jobs, alleviate poverty, reduce unemployment, inequality and can significantly contribute to the overall development of the economy by efficiently utilizing the local raw materials improve food security Chinakidzwa and Phiri, 2020; Paramasivan and Pasupathi, 2016). Agro-processing plants are important for lowering the cost of transportation and storage (Khoza, Senyolo, Mmbengwa and Soundy, 2019).

Agro-allied SMEs drive local innovation in the economy through effective and efficient utilization of agricultural raw materials (Durotimi, Unekwu and Olumoyegu, 2021). The development of the agro-processing industry may also promote diversification of rural economies, reduction in post-harvest losses, increase nutritional value and also increase food security, (Owoo and Lambon-Quayefio, 2018).

According to Abdullahi, Badau, Shuaib and Bako, (2021), promoting agro-processing will offer solutions to many Nigerian social and economic problems; will reduce postharvest losses and make more foods available, reduce poverty by increasing employment, reduce rural-urban migration, improve utilization of local raw materials, increase government revenue, improve local technology, diversify the economy and preserve foreign reserve by reducing imports

For these significant of agro processing firm to be achieved maximally especially in a developing country like Nigeria, they must be well situated and located. Where to locate, relocate an agro processing plant or any firm, is one of the most demanding, intricate questions and a critical decision (Jovanovic 2003; Sule, Basak and Bahattin, 2007 and Ramaul and Ramaul, 2016). Infact, the decision on where to locate a business determines the availability and utilization of input materials, and also determines the accessibility of raw material, labor, market, transportation etc (Nwokocha, 2022).

Notably, locations of agricultural processing/packing firms are critical to the determinants of the efficiency of farm-product assembly and the competitiveness of farm-product (Graubner and Sexton, 2023) Location will also affect agro processing firms' performance, early exit and closure (Nwosu, Madu and Nwokocha, 2019). Again, their proper location will determine their accessibility, efficiency and growth, development and proper harnessing of their advantages and importance.

Hence, this study therefore is geared towards the study of location factors of agro-processing firms in Nsukka. The outcome of the research will help in pinpointing the specific location factors that affects distribution of agro processing SMEs. Again, it will help determine the spatial distribution of the agro-processing SMEs in the local government for proper monitoring of their specific location needs and its development.

The study of this nature is important as most of these agro-processing SMEs are located in rural communities therefore their location will serve as a boost to the sustainable development and diversities of rural economies.

The aim of this work therefore is to measure the spatial distribution and the location factors of agro processing MSMEs in Nsukka L.G.A, Enugu state. The outcome of the research will strengthen and contribute to research on local area spatial data about the spatial distribution and location of agro processing SME. Also, Nsukka LGA is mainly an agrarian locality hence studies on agro processors are need for improve value chain of agric product, reduce spoilage of products and generate more money for the farmers.

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The follow objectives were used to achieve the aim 1. To describe the general features of agro processing SMEs in Nsukka LGA. 2 To examine the spatial distribution of agro-processors in the study area. 3. To determine the factors influencing the location of agro processing MSMEs.

LITERATURE REVIEW

Detection of location and geographic distribution of economic activities at different spatial scales has been of interest to researchers from spatial economics, regional science and economic geography (Zhang, X., Yao, J., Sila-Nowicka, K et al 2021.) The analysis and having good understanding of the spatial distribution of industries is important to planning, creating policy, economic development, linking regional policy development, strategic decision making, business site management, and fostering a country's economic growth (Noori and Mohammadi, 2019; Hassan, Alenezi and Good, 2020; Sun, 2021).

The outcome of the study on spatial distribution of industries in Ethopia and China led to a better policy for industrial development (Fenta, 2014; Dong, Liang,Gao,Luo and Ren, 2016). For example, Albert, Marta, Casanova and Orts (2012) studied spatial location patterns of Spanish Manufacturing firms, using distance-based method, Ripley's K function method and result show that dispersion occurred in some section and concentration in some area. Similarly, Zhang, Zheng, Ye, Zhang and Lin, (2023) investigated the spatial distribution characteristics and influencing factors of various industries in China. Result show variation in the spatial distribution and location factors of the different sectors.

Hence spatial distribution helps to reveal the variations and concentrations in the spatial distribution of industries and subsequent formulating of location specific policies targeted to the different areas to reduce inequality in industrial development. The issue of spatial distribution and location is therefore imperative for policy formulation, industrial development planning based on the specific needs of each sector and site.

The decision to locate a firm or plant in a particular place is an imperative one Rarkumar (2013) and it requires considering of location factors, scale of operation, combination of factors and market conditions (Nwokocha, 2022). Similarly, several factors influence the decision to locate a firm, such as goals, industry, strategy, environment and size of business (Al-Salamin and Albaqshi, 2015). To choose between the multiple factors, they proposed ranking the factors using AHP analysis. Also different sectors require different location factors and distribution pattern. Supporting this claim, Hassan, Alenezi and Good, (2020) used the geostatistical approaches kernel density, multi-distance Reply's-K, and spatial autocorrelation, both global Moran's-I and local Moran's-I, to assess the degree of distribution of manufacturing firms in region of Dhaka, Bangladesh. It was revealed that industries such as garment manufacturing, metal, and brickmaking have a strong presence in Keranignaj and highly associated with proximity to a river, while food processing, rubber and plastics manufacturing industries were clustered in relation to road proximity.

Additionally, a study in Wuhuan, China, revealed that technology intensive industries paid more attention to government policy, urban environment, innovation, entrprenurial environment while labour intensive industries were attracted by labour cost. For Capital intensive industries, it was affected by traffic location and urban prosperity and resource – intensive enterprises attached great importance to industrial parks, higher urban environment conveniences and prosperity.

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This signifies that different industrial types have different location determinants and needs. Hence, we conclude that agro processing industries will have their own peculiarities in terms of spatial distribution and location factors. Sule, Basal and Bahattin, (2007) examined the determinants of location choices of food processing plants, and found that plant location choices are mainly driven by market, raw material and infrastructural facilities. Hesam, Aghaiezadeh and Zadeh, (2020) investigated the distribution of agro processing industries in rural areas of Guilan province India, Site favourable condition are proximity to cities, populations centers and markets, access to infrastructure, proximity to political and decision making centers, access to major roads, access to raw material and cheaper agro processing industries.

The pattern was found to be clustered and not evenly distributed. Fukase and Martin (2018) emphasized the changing pattern in location and development of processing of agricultural commodities. He opined that lower transport cost and communication have made it possible for flexibility in the location of industrial activites. Guo, Lin,Wang and Hunag, 2023 studied the spatial distribution pattern, evolution and influencing mechanism of ecological farms in China. Findings show that the distribution of ecological farms in various provinces of China is uneven and spatially clustered.

Romelic,(1997) studied agro industries in Vojvodina, Yugoslavia and found that most of the industries are heavily concentrated in urban settlements with more than 20,000 inhabitants because presence of infrastructure and concentrated market. Khoza, Senyolo, Mmbenwga and Soundy, (2018), looked at the socio-economic factors that affect the participation of small holder farmer in processing. The result revealed that factors such as educational level, land tenure, agro- processing training and information have positive influence on decision to participate. Also, distance to market and off-farm income negatively influences the decision to participate. Subodh, Goyal and Rakesh (2021) studied the growth and performance of agro processing industries in India. He pointed out the location close to raw material to solve the problem of marketing and unemployment.

Chebokchinova and Kapsargina, (2020) proposed the use of cluster principle in the development of agro industrial complexes in Russia. He proposed this, because clusters have shown to aid industrial growth and regional development. Najib, Kiminani and Yagi, (2011) compared the competitiveness between clustered and dispersed SMEs in Indonesian food processing industry.

The main findings were that there is no significant difference between clustered and non clustered SMEs in their market orientation innovation and business performance. Seluhinga and Damas, (2021) assessed the performance of small agro food processing firms by comparing the performance of 31 geographically concentrated firms and 31 dispersed firms in Tanzania. The paper showed that the clustered firms performed better than dispersed ones. The location characteristics and evolution of spatial agglomeration in China’s forest product manufacturing industry from 1988-2018 and found that the industry, showed a core-periphery structure (Chen, Zhu, Zhao,Zhao and Zhang, 2021).

They further discovered that initially the industry runs from Northeast China- South east coastal provinces but over time, it shrunk to the Southeast coastal provinces of China. In terms of Rural-Urban differentials in location of agri business, Nto and Mbanasor, (2011) found that 75% of agribusiness is locatied in urban areas while 25% are found in rural areas.

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Studies on the spatial distribution and location of agro processing MSMEs is still scanty especially in developing economics like Nigeria, most of the work on agro processing focused on general topics such as Problems and challenges (Nwajiuba,Amazu,Nwosu and Onyneke, (2013), productivity and growth(Dada, Alogwuja and Olumuyegun,2021) and not specifically on location creating a gap in literature which we intend to fill by the findings of this present study.

The only related work is by Oyegbami, Omotayo, Apantaku, Adubi, Fabusoro, (2020) which focused on the spatial distribution of agro-input centers and their accessibility to farmers in Oyo state, Nigeria and cannot be used to make developmental policy for proper location of agro-processing SMEs. An array of literature reviewed show that local/micro level spatial studies on the spatial distribution and location of agro processing MSMEs are inadequate. This paper therefore seeks to examine the location and spatial distribution of agro-processing SMEs in Nsukka, Enugu State, Nigeria.

Hypothesis The hypothesis guiding this work is as follows: Null Hypothesis

Ho: There is no significant difference in the distribution agro-processing SMEs in Nsukka LGA and a random pattern.

H1: There is a significant difference in the distribution of agro processing SMEs in Nsukka LGA and a random pattern.

Study Area

Nsukka Local Government Area (L.G.A), one of the seventeen Local Government Areas in Enugu State of Nigeria. It is comprised of 18 communities namely: Edem, Umuabor, Opi, Opi-Agu, Eziani, Okutu, Okpuje, Obukpa, Ibagwa-Ani, Ehandiagu, Obiomo, Lejja, Ibagwa-Agu, Anuka, Eha-Alumona, Ede-Oballa, Alor-Uno, and Nsukka. It has an area of about 1,810 km² and lies between latitudes $6^{0}44^{1}$ North and $7°12^{1}$North, and longitudes $7^{0}12^{1}$East and $7^{0}35^{1}$East of the Greenwich Meridian (Figure 1).

Nsukka shares boundaries with Igbo-Etiti L.G.A on the south, Uzo-Uwani L.G.A on the west, Udenu L.G.A on the east and Igbo-Eze-North L.G.A on the north, all in Enugu State. Nsukka has a population of 309,633 (NPC, 2009). The rugged relief is part of Udi-Nsukka plateau of the Nsukka-Okigwe cuesta, where remnants of the 'African' planation surfaces are represented by summits of residual hills which characterize the plateau (Ofomata, 2002).

The area is made up of moderately rolling plains and group of hills. It lies within the derived savannah vegetation zone, characterized by incomplete canopy cover which affects soil moisture (Ozor et al., 2015). The soils fall within the broad category of ferrallitic soils, textually characterized as loam, ferruginized subsoil, sand stone and clay soils (Onokala and Phil-Eze. 2001). The soils are mainly reddish brown, pale clay and gravel. The climatic conditions are characterized with high temperature ranges from 270C- 280C There are two seasons, the wet and dry seasons.

The wet season extends from April – October, while the dry season extends from November – March. The annual rainfall range is 1600mm and 2080mm (Anyadike, 2002). Farming constitutes their economic activities, although, some of them engage in petty trading especially those in the urban areas. Some domesticate animals such as poultry, goats, sheep, pigs, cows, etc. However, crop production is the main source of their livelihood. The University of Nigeria Nsukka Community is also a part of the Local Government Area.

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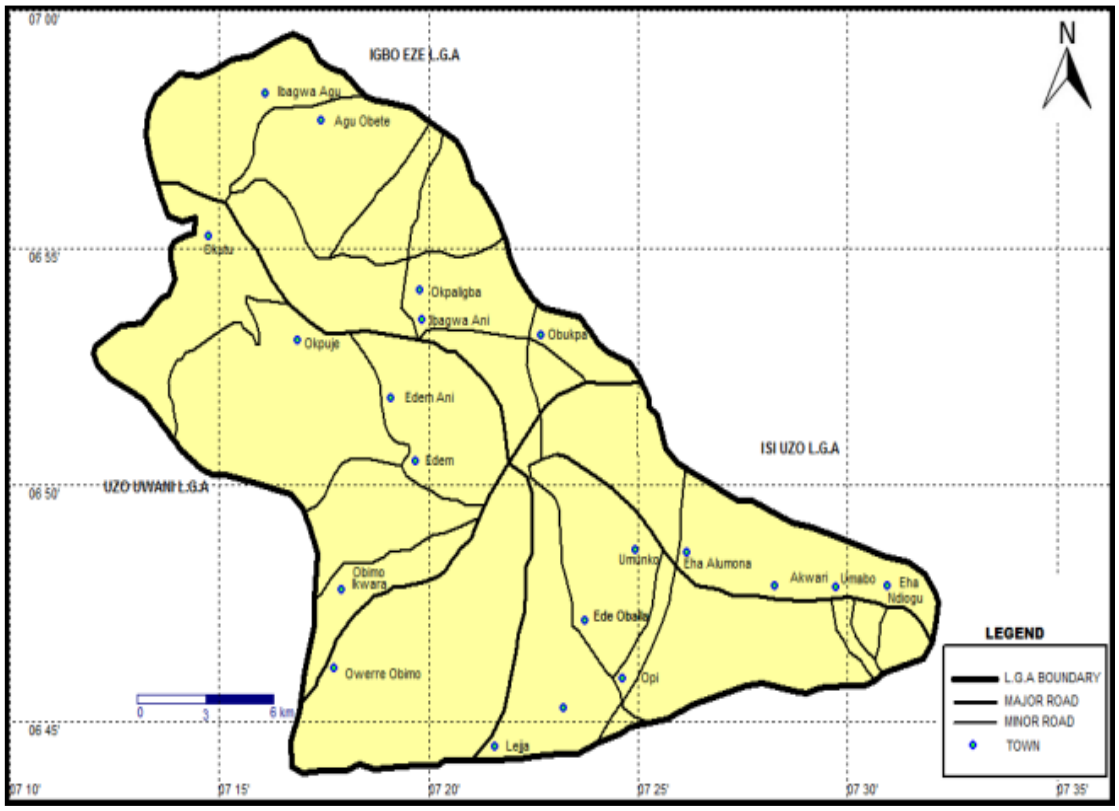

Figure 1: Map of Nsukka Local Government Area showing the Communities

Source: Nsukka LGA Town planning office

METHODOLOGY

Sample selection and Size: In conducting this study, we used the survey research design. We employed purposive sampling to selected 11 communities from the 18 communities made up of Nsukka LGA. We used purposive sampling because the communities are the major agricultural communities located in Nsukka L.G.A. Within the communities, we selected every agro processor plant indentified during our reconnaissance's survey. From the survey, we identified 129 agro-processors thus our sample size is 129. Table 1 shows the distribution of the agro processors in the 12 communities.

Table 1: Number of respondents across communities

S/N	Communities	Number
1	Ede-oballa	11
2	Opi	21
3	Alor uno	15
4	Edem ani	18
5	Obimo	12
6	Ibagwa-ani	14
7	Obukpa	16
8	Lejja	6
9	Okpuje	6
10	Eha-alumona	10
	Total	129

Source Fieldwork, 2023

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Data collection- For data collection, we used field observation, questionnaire and Global Positioning System (GPS). These methods were used to collect primary data on agro-processing MSMEs. Field observation was employed to get the general and descriptive data of the nature of location site of the agro-processor plant, nature of their environment etc. We used structured questionnaire to gather information on the location factors that influence the location individual processor plant. The GPS was used to get their Geo-reference information used in mapping their spatial distribution. The questionnaire is a structured one comprising of two sections A and B. Section A contain questions on socio-economic variables while section two is on location factors. The location factors were measured using nominal scale of 4 Likert scale of 1= Not Influential, 2=Lowly influential, 3= moderately influential and 4=extremely influential. The location factors contain 20 variables.

Data Analysis:

In analyzing our data we used statistical method such as frequencies, percentages, the Relative Index Importance and Principal Component Analysis (PCA). Frequencies and percentages were used the quantify data collected on socio-economic variables of the respondents. The relative Importance Index was used to examine the factors that determines the location of agro processing SMEs in Nsukka LGA. This was calculated using the following formula:

Relative importance index (RII) = Sum of weights (W1+ W2+W3+….+Wn)/AxN… (i)

Where W = weights given to each factors and was ranged from 1-4. A= highest weight (i.e 4 in this case), and N= total number of respondents. The RII of the factors were ranked and later converted into percentages. Response on perceived determinants of the location of agro-processing SMEs was collected on 4 point Likert scale ranging from Extremely Important(4), Moderately Important (3), Not Important (2) and Extremely not important (1)

The principal component analysis was used to ascertain the underlying dimension influencing the location of agro-processing plants in the area. Geography Information System (GIS) was used to analyze the spatial distribution agro-processing firms in the area. Finally, the Nearest Neigbour Analysis was performed to ascertain the pattern of distribution of agro processing SMEs. Nearesr Neighbour Analysis. Nearest Neighbour Analysis was used to test our hypothesis 1 whether the distribution of agro processing SMEs is significantly significant from a random distribution. Thus, the nearest neighbor index is given as:

$$R_N = \frac{d_0}{d_E} \quad \text{..... (ii)}$$

Where R_N is the nearest neighbour index, do is the observed mean nearest neighbour distance and d_E is the expected mean nearest neighbour distance.

Data presentation – Data analyzed was presented with tables and Maps.

RESULTS

Result of the socio-economic attributes of operators of agro processing plants which are our respondents show that majority of the agro processor have age range of 31-40 years(62.5%), followed by 41-50 (19%) while the least represented is above 60 year(1.5%). For Educational qualification, majority had primary and secondary education meaning the

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majority are literate. For marital status, majority are married (69.5%) while 28.1% were never married that those still single. For monthly income, the majority earns less than 50,000 but more than 30,000 which is the minimum wage presently in Nigeria. Most of the operators were found to be males.

Table 2: Socio-economic characteristics of the respondents

Variable	Category	Frequency	Percentage (%)
Age	15-30	17	13.2
	31-40	80	62.5
	41-50	25	19.5
	51-60	4	3.3
	60&above	2	1.5
Marital Status	Never married	36	28.1
	Married	89	69.5
	Divorced	1	0.7
	Separated	2	1.5
	Widow/widower	0	0
Educ. Background	No formal Education	10	7.8
	Primary/Secondary	76	59.3
	Tertiary	42	32.8
Monthly income	Less than 50,000	58	45.3
	51000-100,000	46	35.9
	101,000-150,000	17	13.2
	151,000-200,000	3	2.3
	Above 200,000	4	3.1
Gender	Male	72	55.2
	Female	56	43.7

Sources: Field work, 2023

Table 3 showed the structural attributes of the agro-processing MSMEs. From the table, it could be deduced that source of income for setting up the agro-processing SMEs is mainly from personal savings (46.0) and family members (41.4). The amount used for initial startup is between 500- 2 mil while the least is above 2 million. This shows that to set up all these agro-processing MSMEs require a lot of capital. Again, most of the agro-processors have been in business within 1-5 years (61.7%), 6-10 years (33.5%) while the least is those that are above 10year in operation (33.5%).

Table 3: Structural attributes of the agro- processing SMEs

Variable	Category	Frequency	Percentage (%)
Source of capital	Personal Saving	59	46.0
	Family members	53	41.4
	lender/co-op	11	8.5
	Banks	5	3.9
	Govt Intervention	-	-
	Ngo	-	-
Initial startup amt (in Mil Naira)	Below.5	58	45.3
	5.1-2m	54	42.1
	2.1 & above	16	12.5
Duration of firm operation (Years)	1-5	79	61.7
	6-10	43	33.5
	Above 10	6	4.6
Have Employees	Yes	44	34.3
	No	84	65.6

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Have Apprentice	Yes No	34 94	26.5 73.4
Full time pro.	Yes No	89 39	69.5 30.4
Other Occupation	Farming Civil servant Trading/Business	8 3 17	28.5 10.7 60.7

Source: Field work, 2023

The table showed further that majority do not have employee but operated the machines on their own and most of the operators also have no apprentice. This will affect the continuity in the job because that skilled in the operating of these machines will be inadequate. On the issue of operating the plant as a full-time job, majority of the respondents are into full time operation of the agro-processing plants. This shows that operating an agro processing MSMEs is a sustainable livelihood venture in Nsukka LGA. Lastly, the table revealed that those that are not into agro processing are combining it with trading and farming.

Table 4 show the general description of the agro processors in the study area. From the table, it could deduce that the major agricultural raw materials are that related to grains, palm fruit, tubers and wood.

Table 4: General description of agro-processing SMEs in Nsukka LGA

Agro raw material	Location	Products	Summary
Grain (Maize, Beans, soya, tiger nut, Bambara nut	Along road, in the market and residential quarters	Bambara nut powder, tiger nut drink, soya powder and milk	Uses diesel, petrol or gas for power, mainly family owned buy water and customers' provide their own water. Weekly patronage is highest during the Weekends
Palm Fruits	Close to residential, community square and roads	Palm oil, palm kernel	Monthly patronage seasonal with peak between April and march
Palm kernel	Residential area and mobile plants	Vegetable oil, kernel cakes	Waste creates linkage with poultry and livestock farmers. Operated by men and women
Tubers(cassava)	Proximity to roads and residential areas	Garri, FuFu	Cassava operated by men and women
Wood	Along the road	Woods of all shapes and sizes	Mainly managed by men. Waste are sold to poultry farmers

Source: Field work, 2023

The location based on field observation and interviews by the operators revealed that they are mainly located along the road, residential areas, community square and markets. Also their product varies and they create waste linkage with other MSMEs and households.

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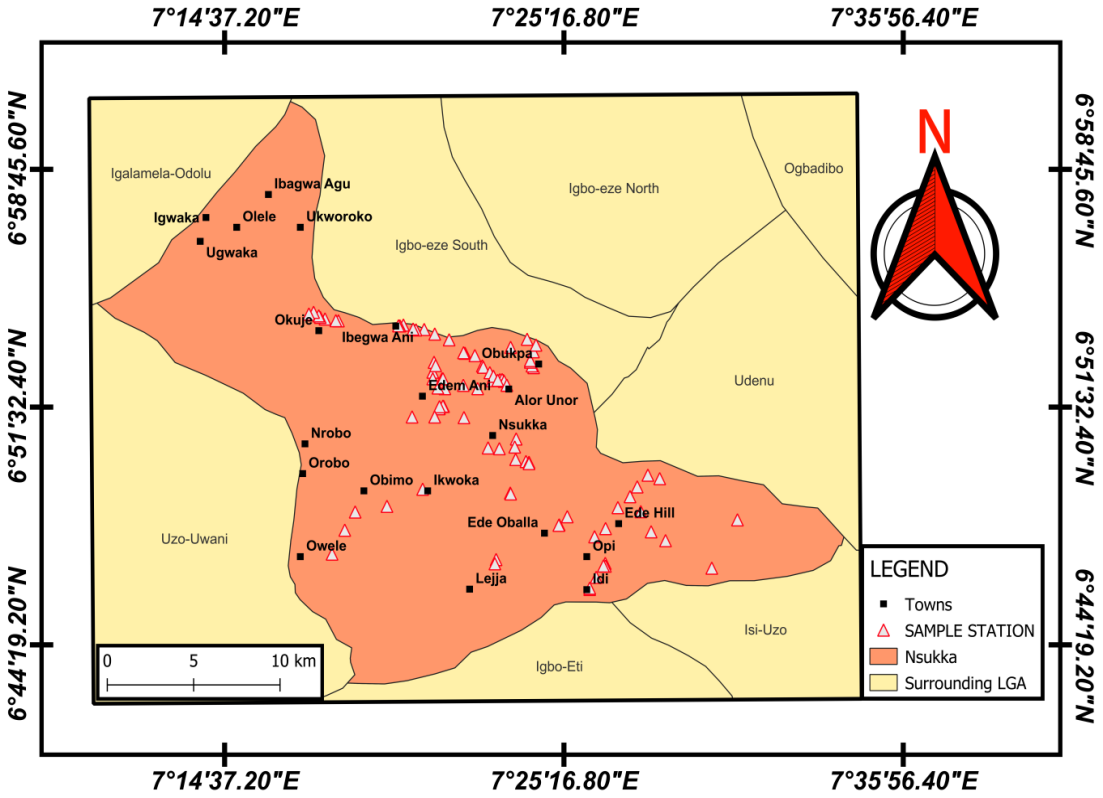

Fig 2: Spatial distribution of agro-processing MSMEs

Source: Field work, 2023

The average distance between is 0.472915652 which suggests a clustered pattern. The spatial distribution of the agro-processing SMEs shows that they have clustered pattern. From the result, we reject our Ho and accept H1 meaning that there is significant difference between the location of the agro processing SMEs and a random pattern.

Result in table 5, showed that proximity to market and location within residential area are highly considered in the location of agro processing SMEs.

Table 5: Location factors of Agro processing SMEs in Nsukka LGA

Factor	RII	%RII	Rank
Proximity to market	0.885	88.5	1
Close to residential area	0.873	87.3	2
Availability/access to loan and credit	0.867	86.7	3
Availability of appropriate agricultural raw material	0.865	86.5	4
Proximity or access to roads	0.846	84.6	5
Cost of land is not expensive	0.822	82.2	6
Availability of land	0.807	80.7	7
Cost of renting shop is cheap	0.805	80.5	8
Close to other processing facilities	0.752	75.2	9
Owners' location/place of origin	0.730	73.0	10
Availability of an existing processing facilities	0.721	72.1	11
Existence of waste management facilities	0.645	64.5	12
Influence of government	0.514	51.4	13
Proximity or access to power supply	0.506	50.6	14

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Availability of labour	0.453	45.3	15
Availability of water	0.445	44.5	16
Proximity to machine part sellers	0.436	43.6	17
Good relationship from environmental regulators	0.428	42.8	18
Suitable terrain	0.424	42.4	19
Climate	0.369	36.9	20

Furthermore, the table indicated that terrain and climate with RII of 42.2% and 36.9% were least considered in the location of agro processing SMEs in the study area. The portrays the inadequate consideration of environmental issues in the sitting of agro processing SMEs, it might be because most of the operators and owners are not professionals and do not consult professional location experts in considering locations for their SMEs.

Table 6: Varimax Rotated Principal Components Matrix for Location factors of Agro-processing firms

Variables	Components				
	I	II	III	IV	V
Cheap or no cost for land	**.609**	.163	.167	.486	-.303
Low rent of shops	**.804**	.042	.019	-.071	-.330
Closeness to other processing MSMEs	**.637**	.391	-.029	.265	-.109
Availability of existing processing firms	.216	**.654**	.104	.198	-.079
Access to machine parts seller and repairers	.406	**.630**	.193	.050	-.237
Availability of agricultural raw material	.266	**.679**	.429	-.372	.562
Easiness in waste management	.119	.135	**.759**	.123	.179
Suitable terrain	-.001	.412	**.701**	.081	.154
Access to market	.124	.182	.080	**.685**	-.349
Capital availability	.427	.107	-.090	**.793**	-.175
Birthplace/place of residents	-.308	.164	-.049	.115	**.685**
Personal likeness	-.306	.163	.199	.357	**.765**
Proximity or access to power supply	.574	-.226	.286	.484	.112
Good relationship from Environmental regulators	-.107	.313	.192	.022	-.110
Influence of government	.122	.122	.596	.114	-.400
Availability of water	.495	.127	.414	-.046	-.012
Availability of labour	.495	.127	.414	-.046	-.012
Availability of land	.243	.089	.580	-.033	.044
Closeness to residential area19	-.053	.039	-.053	-.193	.559
Proximity or access to road	**.716**	.241	-.040	.070	.068
Eigen Value	3.282	2.593	2.470	2.156	1.847
% of explained variance	16.408	12.963	12.349	10.782	9.236
Cumulative variance	16,408	29.371	41.721	52.503	61.739

Source: Field work (2023) ***Significant loadings =/- 0.60**

From table 6, component I has an Eigen value of 3.288%, a percentage of variance of 16.408% and a cumulative percentage of 16.408%. The component load significantly on and positively on four variables. They are cheap cost of land (0.69), low rent cost of shops (0.804), closeness to roads (0.719) and closeness to other processing firms (0.637). From the variables, it indicates that Cost and accessibility to production infrastructure are important and significant to location of agro-processing in Enugu state. Hence we named the component the effect of **cost and accessibility to production infrastructure.**

Component II has an Eigen value of 2.593%, a percentage of variance of 12.963% and a cumulative percentage of 29.371%. The component load significantly on and positively on three variables. They are Availability of existing processing facilities (0.654), access to

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machine parts seller (0.719) and Availability of agric raw material(0.679) From the variables, it indicates that machine inputs are important and significant to location of agro-processing in Enugu state. Hence we named the component the effect of **Machine and raw material inputs**

Component III has an Eigen value of 2.470%, a percentage of variance of 12.349% and a cumulative percentage of 41.721%. The component load significantly on and positively on two variables. They are Easiness in waste management (0.759) and Suitable terrain (0.701). From the variables, it indicates that Environmental issues are important and significant to location of agro-processing in Enugu state. Hence we named the component the effect of **the Environment**

Component IV has an Eigen value of 3.288%, a percentage of variance of 16.408% and a cumulative percentage of 16.408%. The component load significantly on and positively on two variables. They are access to market (0.685) and capital availability (0.793). From the variables, it indicates that Economic factors are important and significant to location of agro-processing in Enugu state. Hence we named the component the effect of **Economic Factors.**

Component V has an Eigen value of 3.288%, a percentage of variance of 16.408% and a cumulative percentage of 16.408%. The component load significantly on and positively on two variables namely birth place/ Place of residents (0.685) and personal likeness (0.765). From the variables, it indicates that place of origin and familiarity of people in the place of residence will increase their livelihood to locate their agro processing plants. Hence we named the component the effect of **Personal factors.**

DISCUSSION

Evidence from the age of most of the operators as shown in this work is that they are mainly within the working class age of 31-59 years. This is evident that agro processing SMEs is a gainfully and sustainable ventures which are capable of providing gainful employment for the teeming youths that are unemployed. Also these agro processors are mostly operated by males, this is partly because most of the engines used for processing agricultural raw material are manually operated and hence strenuous in operation and powering therefore, women find it difficult to operate.

The women represented are mainly those that operate small grain grinding engines in their compound while the men mostly operate the palm oil production machines, cassava grinding machines and wood processing plants. Our finding on socio economic characteristics of the operators is in agreement with findings of (Oyegbami et al 2020, Mkura, Nalaila and Isaga, 2020, Ramchndra, 2014, Mgbakor, and Ekerete and Ekanem, 2015). They discovered that majority of agro processors are married, literate and of middle age.

The finding is important because as opined by (Mthombani, Aniti and Odu, 2022,) age, farming experience, municipalities and educational level are important to agro processors access to training, productivity and performance. Again, source of funding for setting up these agro processing SMEs are from personal savings and family members.

This shows the entrepreneurship spirit (“ike otu onye” in Igbo language) of people of South East geopolitical zone of Nigeria. Also, the issue of family member support show the extended family system practiced in Igbo communities mainly referred in our native language as “igwe bu ike”. These two factors individuality and family support mostly drive the entrepreneurial drive and economic growth and development of the people of south-eastern origin in Nigeria.

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Our finding on source of income collaborates positively with the findings of (Chilembo, 2021; Ramachandran and Yahmadi, 2019) they discovered that most SMEs in developing countries fund their business using personal savings. Furthermore, Years of operation show that most of the agro processing SMEs have operated less than 10 years. This varies with finding of Nto and Mbanasor, (2011 and Shauibu et al 2018) they found that agribusiness in Abia state and Kano state of Nigeria operated above 15 and 20 years respectively. This indicates that the sustainability of these agro processing SMEs in Nsukka is debatable. Trend in their establishment showed that most of the agro processing SMEs were established between 2019 -2022.

For the spatial distribution of the agro processing SMEs, it was found that they are found in close proximity to each other. The result corroborates with findings of (Aghaiezadaeh and Mohammadzadeh, 2020; Rahama and Kabir,2019) they discovered that agro processing SMEs are always found in clusters. The agro processors are always in clusters so as to share knowledge, information, sharing equipment, customers and other mutual benefits. In fact, the clustered nature of SMEs gives room for economies of scale, ideally it is expected to facilitate synergy, specialization, cost reduction via the use of infrastrucutural facilities available and supply chain (Lee, park, Yoon and Park, 2017). Factors of location of agro processing SMEs show that they mostly influenced by market and demand. This is because agro processing SMEs are mainly service providers thus they need to be located close to their customers so this explains their preferred location close to residential areas which houses the population and market required for them to be in business. Also the result indicates the significant of market because locating within residential areas means that operators of agro processing SMEs wants to be close to their households who are the bulk of their customers. Generally for any area to attract these agro-processing SMEs, these five factors are required infrastructure, raw material, physical environment, economic factors and personal interest. This in agreement with Nwokocha, (2022), who found that economic factors, infrastructure and personal interest are among the factors considered for the location of women owned SMEs in Nigeria. For these agro-processing SME to be sustainable in provision of means of livelihood, add value to agricultural raw material and enhance food security, they need to be properly situated in the right location. Actually, location of SMEs plays a crucial role in determining their survival (Banwo, Du and Onokala, 2017).

CONCLUSION AND RECOMMENDATIONS

Agro processing MSMEs is important for agricultural sustainability and product value chain development. It creates a good linkage between agriculture and industries and also indispensible in rural economies. This form of SMEs is significant for creating employment, livelihood sustainability, attaining food security, reducing waste, need for storage facilities and improving the income of farmers. This is because processed agricultural raw material will have more shelf life, increase in utility and value thus will fetch more money and income for farmers and food vendors. So for these profitable agricultural ventures to be sustainable in providing its numerous advantages, their location needs to be studied adequately. This study revealed that most of the agro processors are clustered in their location. This is important because SMEs found in cluster are bound to perform better because of the mutual benefits amongst them which are better tapped when located in close proximity to each other. The mutual benefits includes knowledge and information sharing, bulk buying of machines and raw material, customers spillovers, linkages, sharing infrastructures etc. Therefore policy to develop them should be of high priority in economic development planning of developing economics especially for rural

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industrialization, development and economic empowerment. Based on our findings, we recommend the following

1. Development of cluster programs- Government through Public-Private partnership arrangement should provide land in close proximity to residential areas and farm lands for location of agro processing SMEs. This location should have availability of infrastructure such as road, pipe borne water and machine repairers which will aid in the operation of the agro processors
2. Government should sponsor research on automated machineries- Research on automated machines that process cassava into flour, Garri, Palm oil should be heavily invested in to narrow the gender gap in operation of these machines. It will also allow more work and money on the processors.
3. Youth empowerment through setting up Agro-processing plants- Having seen from the study that most of the agro processors are making enough money that sustains them, it is advised that loan and capital be provided to employ youths to enable them set up agro processing firms. This will help in creating unemployment, rural-urban migration, combat crime and hunger.
4. Government provision of agro processing machine to different localities as an empowerment program, the provision of components parts through Private Partnership.
5. More Funds should be made available for research and development for research base on agro Processing SMEs.

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