Evaluation of Effects of Environmental Pollution by Small Scale Gari Processors in Anambra State of Nigeria

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Abstract; **Effect of gari processing to the environment in Anambra State of Nigeria was studied. One hundred processors were purposively selected from three out of five agricultural zones of the state. A well-structured questionnaire was used to collect information needed for the study. The objectives of the study were addressed using percentages, multiple regression, gross margin analysis and factor analysis. The results show that most gari processors were aged, fairly educated, well experienced, high number of household size and membership of organization. The effect of gari processing to the environments were littering of the processing surroundings with cassava peels, effluents, noise, fibrous waste and cyanide vapour and ash. The determinant of processors' socio economic characteristics to the rate of environmental pollution were years of processing experience, membership of organization, level of education and access to extension services. Gari processing is profitable in the study area with net profit of N65, 050 and Benefit cost ratio of 1; 2;8.The constraints to gari processing in the study area were shortage of raw materials, high cost of labour, high cost of processing and storage equipment and high cost of energy. There is need to ensure farmers' access to educational programs, credit and extension services.**

Keywords; **Gari, Processing, Environment, Anambra State, Nigeria.**

I. INTRODUCTION

Cassava is a staple food for not only millions of people in the tropics and sub- tropics, as well a cash crop for international market (Nweke, 1996, Anozie, *et al;* 2014). It is the second most important staple crop after maize in terms of calories consumed with Nigeria being the highest producer in the world with annual production of 38.179 million metric tons (Nweke, *et al*, 2001, Okoronkwo, *et al*; 2016). Cassava root is perishable and contains 70 % moisture by weight and cyanogenic glycosides which breakdown to form hydrocyanic acid (HCN), a toxic compound (Ume, et al; 2016; Onunka, *et al*; 2017). The root is usually utilized in processed forms in order to reduce its moisture content and weight, improve product storage ability, enhance flavour and reduce the HCN potential (Nweke, 1996 , Nnadozie, *et al*; 2015). Also, processing has the capability of reducing the bulkiness of the crop, reduction in transportation costs, extends shelf life as well as adding value to the products (Nweke, *et al*; 2001).

In among the staples derived from cassava root processing, gari is the most popular and could be white or yellow in colour depending on cassava variety used or oil added during toasting (Ume, *et al*; 2016). Statistics of gari consumption in Nigeria is staggering depending on the zones and localities. Nevertheless, according to Nweke, (1998) and International Institute Tropical Agriculture,(IITA),(2006), about 28.41 million people representing 31% consume gari once, twice and thrice daily respectively. The high acceptability of gari as asserted by Okafor, *et al*; (1998) may possibly be attributed to the fact that it is ready to eat, ease of storable and could be processed to conform to the preference of the consumers.

Gari processing techniques and procedures differ with countries and localities within a country but as function of food cultures, environmental factors (such as availability of water and fuel wood), the cassava varieties used, types of processing equipment and technologies available (Onabowale, 2008). Gari processing could be through traditional (small scale methods using graters, millers and pressers) or and modern processing methods. Nevertheless, the village gari processing involves peeling – size reduction – fermentation - drying - roasting (garification) (Nweke,1998; Ume, *et al*; 2016). Studies (Gomez, *et al; 1984;*, 2016, Akorda, 2008, Adewoye and Sawyear; 2016) inferred that traditional method is often very tedious and time consuming. Furthermore, gari processing at village level is beset with problems bothering on climatic factors, inadequate raw materials, high cost of labour, firewood problems, especially during rainy season, high energy costs, poor access to credit, high cost of machine spare parts and competition among processors (Nweke and Enete, 1999; Akorda, 2008). However, with the development and use of improved processing technology by Rural Agro-Industrial Development Scheme (RAIDS), Product Development Agency (PRODA), Federal Institute of Industrial Research (FIIRO), National Root Crop Research Institute (NRCRI) and

International Institute for Tropical Africa (IITA) in the country (IITA, 2007), there is general reduction in the gari processing time, labor saving, reduced drudgery, higher processing efficiency and more production (Nweke, *et al*, 2001; Ariyomo, 2017).

Processing of gari has numerous environmental consequences, include affects the quantity and quality of water supply through its waste products such as pulp, solid and water waste if not properly managed (Nweke and Enete, 1999). In addition, the water waste "squeeze water" from gari processing has very high biological oxygen demand (BOD), hydrogen cyanide (HCN), chemical oxygen demand (COD) and suspended solids which if not sufficiently treated before discharging into the water bodies might be a serious threat to aquatic life (Ariyomo, 2017). Also, the slurry from the processing unit is capable of emitting odour to the immediate environs and breeding ground for mosquitoes and house flies, if it(slurry) deposits in gutters and in stagnant ditches (Ehiagbonare, *et al*; 2009; Omotiona, *et al*; 2013). As well, noise from the processing plant could be source of annoyance as it (noise) is capable of causing hard hearing and cardio - vascular disease to the victims (Onabowale, 2008).

In Nigeria, Federal Environmental Protection Agency (FEPA) is an agency responsible for protecting her environs from pollution, with affiliates in all the States of the country. Furthermore, in pursuant to its goal, the agency enacted these acts; National Environmental Impact Assessment Acts of 1992(EIA), Harmful Wastes (Special Criminal Provisions).Act of 1992 and National Environmental Protection (Effluent Limitation) (Environment Protection Agency (EPA) (Ume, et al; 2018). The success of the agencies in different States of the Federation has been with mixed feelings. As few states celebrate near success, while moribund in many others, hence leaving significant parts of the states in squalors(Uhegbu, 2012). The most common factors often cited to the above scenario are corruption and inadequate logistics (Onabowale, 1998). However, because of lax in implementation of the environmental laws, many gari processors especially in rural areas capitalize on that to filth the environs by releasing their untreated wastes to the gutter and streams outside their processing domain (Mogaji, 2015).Therefore, it becomes imperative to examine the effect of gari processors' socioeconomic characteristics in stemming out the mess, as this could guide policy planner, environmentalists and extensions in formulating policies designed at preserving our environment for today and future generations gains. The specific objectives of the study are to describe the socio economic characteristics of the processors; identify the effect of cassava processing to the environmental; determine the relationship between the processors' socio economic characteristics and rate of environmental pollution and identify the constraints to cassava processing in the study area.

II. MATERIALS AND METHODS

The Study Area

Anambra State of Nigeria and is located between latitude 5038 'N and $6^0$47 'E of Equator and longitude $6^0$36 'N and 7021 'E of Greenwich Meridian. Anambra State has population figure of 4.184 million people(National Population Commission, (NPC), 2006). The state has annual rainfall range of 1600 mm – 1700 mm, which is distributed from February to December. The state has mean temperature of 27 ^{oC} all through the year, but highest from February to April (NRCRI, 2006). The inhabitants are producers and processors of major food crop such as cassava, yam, cocoyam, maize, rice, sweet potato, vegetables and fruits.

Sampling Procedure and Sample Size

A multi-stage random sampling technique was used to select one hundred and twenty processors for the study. A structured questionnaire and oral interview were used to elicit information for the study. Percentage responses, multiple regression and factor analysis models were used to capture the objectives.

Method of Data Collection

The information for the study was derived from primary and secondary sources. The primary data were obtained through the use of structured questionnaire and informal or oral interview of respondents. The secondary sources was derived from review of related literatures, text books, conferences papers, seminar, journals, published and unpublished thesis, workshop, the internets, and government publications.

Model Specification

Multiple Regression Analysis

Four functional forms (Linear, Double log, Semi log and Exponential functions) of production function were tried and explicitly represented as

Linear function:

$$Y = b_0 + b_1 x_1 b_2 x_2 + b_3 x_3 + b_4 x_4 + b_5 x_5 + ei \quad (1)$$

Double log function (Cobb Douglas):

$$\ln(y) = \ln b_0 + b_1 \ln x_1 + b_2 \ln x_2 + b_3 \ln x_3 + b_4 \ln x_4 + b_5 \ln x_5 + ei \quad (2)$$

Semi double log function:

$$Y = \ln b_0 + b_1 \ln x_1 + b_2 \ln x_2 + b_3 \ln x_3 + b_4 \ln x_4 + b_5 \ln x_5 + ei \quad (3)$$

Exponential function:

$$\ln Y = b_0 + b_1 x_1 + b_2 x_2 + b_3 X_3 + b_4 x_4 + b_5 x_5 + ei \quad (4)$$

The choice of the best functional form was based on the magnitude of the R^2 value, the high number of significance, size and signs of the regression coefficients as they conform to *a priori expectation.*

Multiple regression can be presented as $Y = X_1 + X_2 + X_3 + X_4 + X_5 + X_6 + - - - - Xn + e$ ……………………(5)

Where Y =Rate of pollution

X_1 = Gender (Dummy), X_2 = Ageof processor (Years),

X_3 =Level of education (Yrs),

X_4=Credit access(Access,1;otherwise,0),

X_5=Farming experience(Yrs),

X_6=Extension services(Access1, otherwise,0),

X_7 =Membership of organization (Member, 1; otherwise, 0),

e = error term *actor analysis Model*

Factor analysis model was employed to identify the constraints to gari processing. The principal component factor analysis with varimax –rotation and factor loading of 0.3 was used. The constraints observed by processors were grouped into four factors using varimax rotation and factor loading of 0.30.The principal component factor analysis model is stated thus;

$Q_1=M_{11}K_1+M_{12}K_2+M_1nKn$………………(6)

$Q_2=M_{21}K_2+M_{22}K_2+ M_2nKn$…………………(7)

$Q_3=M_{31}K_3+M_{32}K_2+ M_3nKn$…………………(8)

$Qn=Mn1K_3+Mn_2K_2+-MnnKn$………………….(9)

Where; Q_1 = cn= observed variable /constraints to gari processingpdts.

M_1=Mn = factor loading or correlating coefficients.

K_1=Kn =unobserved underlying challenging factors facing gari processing.

IV. RESULTS AND DISCUSSION

Table I shows that most (75%) of the gari processors were females, whereas only 25 % were males.

Table 1: Distribution of Respondents According to their Socioeconomic Characteristics

Variable	Frequency	Percentage	Mean	Standard deviation
Age				
18 – 28	30	25		
29 – 39	40	33.3	6.4	2.53
40 – 50	35	29.2		
51- 61	10	8.4		
Above 62	5	4.4		
GENDER				
Males	30	25		
Females	90	75		
Marital Status				
Married	100	83.3		
Single	15	12.5		
Widowed	5	4.2		
Organization				
Yes	80	66.7		
No	40	33.3		
Educational Level				
0	40	33.3		
1 -6	25	20.8	7.2	3.32
7 -11	35	29.2		
12 and above	20	16.7		
Processing Experience				
1 – 5	10	8.3		
6 – 10	30	25		
11 – 15	20	16.7	8.4	4.12
16 – 20	35	29.2		
Above 21	25	20.8		
Extension Services				
Yes	80	66.7		
No	40	33.3		

Source; Field Survey,; 2018

This implies that females dominated gari processing in the study area. Therefore, there is every likelihood that these women could use their children to accomplish certain activities in gari processing, included cassava root peeling, sieving and fetching of fire wood to be used for toasting (Akorda, 2008). Furthermore, 55.3% of the respondents were less than 40 years of age, while 44.7% were above 40 years.The implication is that most of the processors are able –bodied individuals that could withstand the strain and stress involved in gari processing.. The finding of (Onabowale, 2008), posited that young people is innovative and more dynamic in adoption of innovations that may perhaps reduce environmental pollution.

Besides, most of the respondents (83.3%) were married and only 12.5% and 4.2% were single and widowed respectively. Married individual usually have responsibility, hence might be willing to adopt innovations that will less expose them to health hazards, which could tantamount to huge medical bills to the family(Omotiona, *et al*; 2013)willing to adopt innovations that could less expose them to health hazards, which could tantamount to huge medical bills to the family(Omotiona, *et al*; 2013). As well, 66.7% of the processors were members of different organizations, while 33.3% were not. Cooperative enables members to have access to information on improved innovations in processing that is capable of preserving the environment and as well maximize their output (Ume, *et al*; 2018). More so, 86 % of the sampled respondents had formal education with average educational level of 7.2 and standard deviation of 3.32. Educational status of the processors aids in comprehending on the need to preserve the environs by using appropriate technologies to that effect. Furthermore, educated processors could be able to read and comprehend environmental pollution guides and manuals/ written messages, and the precautionary measures to abate them (Nweke, *et al*; 2001). Nevertheless, only 14% of the sampled processors had no formal education. Moreover, 66.7% of the respondents had been in gari processing for more than 10 years, implying that the processors were highly experienced in the job, thus could surmount inherent problems associated with the business. The finding of Akorda, (2008) harmonized with the asserted claim. He posited that processors with long years of processing experience could easily set realistic target of their processing output without compromising to environmental degradation. Indeed, only 33.3% of the respondents had processing experience less than 10 years, average of years of processing experience of 8.4 and standard deviation of 4.12. The Table as well, indicated that 66.7% of the respondents had poor extension outreach. This entails that there is a very high probability of the respondents compromising to degradation of the environments in the course of their attainment of processing objectives. This could probable because the processors had no access to innovations on environmental conservation and technical assistant as disseminated by the change agent (Onabowale, 2008).

Table 2 shows that 62 % of the respondents complained about noise from processing generator plant.

Table 2 Identify the effect of cassava processing to the environmental

Variable	Frequency	Percentage
Cassava peels	90	75
Affluent	75	62.5
Noise	62	51.7
Cynaide Vapour and ash	58	48.5
Fibrous waste	78	65
Starch residue water	66	55
Human relation	62	51.7

*Multiple Response Source; Field Survey; 2018

Studies (Nweke and Enete, 1998, Akorda, 2008) revealed that such noise is capable of causing noise – induced hearing loss, and cardiovascular effects to the victims. More so, 58% of the respondents reported of problem of cyanide vapour and ash. This issue is very serious especially where the processing is done in a closed enclosed (Ehaiagbonare, *et al*; 2009). The cyanide in gari could be reduced during cassava processing through heating, fermentation and addition of palm oil during gari toasting (Omotiona, *et al*; 2013). In addition, problem of fibrous waste through sieving of squeezed cassava root mash was opined by 78% of the sampled processors. Seepage from fibrous waste exposed to rainfall could contaminate the ground water, leading to death of aquatic fish, as reported by Ariyomo, (2017). Besides, 66% of the respondents complained about problem of starch residue. The waste water from the starch residue, if discharged into water bodies without treatment, might cause foul odour to the water, high BOD and COD, and eutrophication (Eisler, 1991). Additionally, 62% of the respondents reported about poor human relation as result of environmental pollution. Studies (Ehaiagbonare, *et al*; 2009; Omotiona, *et al*; 2013,;Ume, *et al*; 2014) shows negative correlation between human relation and environmental pollution. Poor human relation often leads to unhealthy annoyance and discourage capital investment leading to slow growth in such community outside cassava processing (Ariyomo, 2017)Also, 90% of the sampled processors reported the problem of cassava peels littering around processing houses. These peels are often rich in fibre and cyanide content, which is capable of generating foul odour and could pollute ground water, especially during rainy season (Adewoye and Sawyeear, 2016). Odour pollution may prompt distasteful sensation which could have undesirable physiological reactions and olfactory functions (Uhegbu, 2012). Pollution due to odour has resultant features of difficulty in breathing and sleeping, coughing, stomach and loss of appetite, eye, nose and throat irritation, disturbance from external environment and annoyance Ariyomo, 2017).Furthermore, cassava peels are often abandoned on the ground along road side and when it ferments, the road becomes impassable ((Ariyomo, 2017). Furthermore, effluent (75%) resulting from squeezing of mashed cassava roots has high content of cyanide and organic matter , which could predispose the environment to pollution , resulting in dissipation in waterways, kill plants, eutrophication and foul odour ((Ehaiagbonare, *et al*; 2009). .Also effluents from cassava processing could result in acidification of the environments due to the hydrolysis of cassava cyanogenic glycoside, linamarin and lotaustralin (methyl linamarin) resulting in production of hydrogen cyanide, which could be hazardous to animals, fisheries and other organisms (Onabowale, 1998). Injection of food contaminated with cyanide can predispose individuals to nutritional neuropathies such as tropical ataxic neuropathy and epidemic spastic paraparesis diseases which is capable of affecting the spinal cord. Also, long term effects of exposure of cyanide toxicity food could lead to neurological health issues, hyperventilation, headache, collapse and coma, nausea and vomiting, generalized weakness, perhaps with convulsion and then respiratory depression (Omotiona, *et al*; 2013).

Table 3 shows that Cobb Douglas production function was chosen as lead equation based on the statistical and econometric criteria.

Table 3Multiple Regression Result

Variables	Cob Douglas	Exponential	Linear	Semi Log
Constant	5.590(13.496)***	6.509(16.801)***	5.250(7.302)***	6.090(8.902)***
Gender	-1.091(-0.396)	2.901(4.502)***	0.318(1.971)*	0.527(-2.508)
Age	-1.237(2.890)**	3.720(-0.128)	-0.198(0.173)	1.764(-0.821)
Education	4.501(4.006)***	0.500(0.118)	0.338(0.304)	2.188(2.721)**
Credit	-0.41(-0.291)	0.133(2.145)**	0.121(2.821)*	-0.327(-3.447)
Experience	3.055(2.654)**	0.229(0.502)	0.736(1.389)*	-9.507(-0.245)
Extension	3.620(1.890)*	0.267(3.400)***	0.925(1.069)*	6.207(3.608)***
Organization	2.073(2.186)**	4.509(0.108)	0.378(0.606)	7.908(1.218)*
R2	0.877	0.731	0.669	0.760
F-value	7.801***	5.456***	3.900***	4.761***

Source: Field Survey, (2018)

*, ** and *** implies significance at 10%, 5% and 1% respectively

It has coefficient of determination (R^2) of 0.877, implying that 87.7% of the variation in the output of the gari processors were accounted by various factors included in the model, while the remaining 12.3% were due to error term. The coefficient of the age of processors was negatively signed and significant at 5% risk level. The sign identity of the coefficient could be linked to conservative nature to the adoption of new gari processing environmental technologies for fear of failure. In contrary, Ume, *et al* (2016)found age of the processors to have positive correlation with the dependent variable, since youths are often innovative and motivational to employ new improved processing technology could not only enhance their welfare but less propensity to harm their environment (Kolawole, 2014). The coefficient of the extension services was positive and significant at 10% probability level. According to Adewoye and Sawyear, (2016), the frequency of extension agents visits to the processors is capable of causing positive behaviourial changes after careful ruminating on the potential gains of improved processing environmental friendly technology. However, studies (Ehiagbonairre, *et al*, 2009;Uhegu, 2012; Omotiona, *et al*; 2013) found negative relationship between the two variables. This they correlated to the negative attitude of the change agents to their duties as result of poor salary, inadequate incentives and inadequate training on the subject area

In line to *a priori* expectation, the coefficient of years of processing experience had direct relationship to the dependent variable at 95% confidence level. The number of years a processor had spent in the processing business according to Ume, et al, (2016) may give an indication of the practical knowledge he/she had benefited in subverting processing predicaments. In the same vein, Nweke, (1998) remarked that experience enables processors to lay down practical goal bearing in mind environmental sustainability. The consequences of wealth of processing experience as acquired by the processor as noted by Ehiagbonairre, *et al*, (2009) is to enhance he /she capacity of maximizing his/ her output and profit at minimum cost, without the actualization of these objectives being an annoyance to the ecology. As expected, the coefficient of educational attainment had the desired positive relation to the dependent variable and significant at 1% risk level. The level of educational attainment by the processors could not only increase his processing productivity but as well enhance his ability to comprehend and evaluate new processing technologies that are aimed at achieving high environmental sustainability (Onabowale, 2008). The educational status of the processor as reported by Omotiona, *et al*; (2013)could impact directly on the quality and quantity of processors' output and their attitude towards ecosystem preservation. The coefficient of cooperative had a positive sign identity which is synonymous with *apriori* expectation and significant at 5% alpha level. Studies (Nweke, *et al*; 2001, Nnadozie, *et al*; 2015; Ume, *et al*; 2016) show that cooperative could be source of material inputs of the technology (cassava roots, processing machines, fryers and sieves), credit for hiring of labour, capacity building and training of members on environmental friendly processing innovation.

Table 4 shows estimated costs and return in gari processing for 1000kg of cassava roots.

Table 4: Profitability of Gari Processing

Iterm	Unit	Output	Unit price	Value	Percentage
Revenue(TR)	Kg	350	300	100, 500	
Variable Costs					
Cassava roots	Kg	100o	20	20000	56.4
Peeling/ Washing	Manday	800	1	800	2.2
Grating/dewatering	Bag	100	5	500	1.4
Pulverizing/sifting	Manady	500	1	500	1.4
Toasting	Manday	1000	1	1000	2.8
Sieving and Packaging	Manday	100	1	100	0.2

Firewood/fuel Bundle	Bundle	100	4	400	1.1
Transportation				200	0.5
Opportunity of capital (25%)				5,750	
Total Variable cost 29, 250				29,250	
Total Fixed Cost				6,200	
Gross Margin				50,085	
Total Cost(TC)				35,450	
Profit				65,050	
Benefit Cost Ratio (BCR)TR/TC				2.8	

Source, Field Survey, 201 *Naira(N) (Nigeria local currency) has US Dolla of N366 per a Dollar

The results revealed that 350kg of gari was obtained from 1000kg of cassava roots. The total variable costs incurred was N29,250, which is 66% of the total cost of processing, with the cost of cassava roots (56.4%)constituting the highest, while the lowest, cost of fire wood (1.1%). The high cost of cassava tubers could be ascribed to the season of harvest and number of competitors (Mogaji, 2015).The least cost of firewood could be related to ease of availability and low cost especially in the study area (Akorda, 2007). The gross margin of N50,085 was realized, which is in line with Ume, *et al*; (2016) in their study of economics of gari processing in Ivo Local Government Area of Ebonyi State, Nigeria . The total fixed cost incurred was N6, 200 with net profit of N65,050 realized. Table 5 revealed that three factors were extracted based on the response of the respondents,

The benefit cost ratio of 1; 2;8 was realized, implying that in every 1.00 spent, N2.8 is realize

Table 5: Varimax-Rotated Factors Against Constraints to Gari Processing in the Study Area.

Variable	Factor 1	Factor 2	Factor 3
High labour cost	0.026	0.123	0.409
Shortage of material input (Tuber)	0.196	0.432	0.016
High cost of transportation	0.299	0.368	0.09
Processing and storage equipment	0.125	(0.450)	0.129
poor access to credit	0.386	0.118	0.006
High energy cost	0.391	0.221	0.223
Low patronage	0.422	0.310	0.431
Theft	0.336	0.348	0.234

Source; Computed from SAS 2018.

Factor 1= economic/institutional factor, Factor 2 = infrastructural factor and Factor 3 = socio-financial factor (Adewanyi, 2003, Amusa, 2015). Only variable with factor loading of 0.30 and above at 10% overlapping variance were used in naming the factors.This is line with the finding Ume, et al; 2014 who are of the opinion that varibles with factor loading of less than 0.30 were not limiting factors to gari processing. The variables that loaded more than one factor were discarded. Variables that loaded more than one factor like low patronage and theft were discovered. In naming the factors Enete and Amusa, 2010) stated that each factor is given a denomination based on the set of variables or characteristics it is madeof..Li mitations under the economic /institutional factor include poor access to credit (0.386), high energy cost (0.391). The dearth to credit access by the processor could be linked to ignorance of credit facility by the banks, short term repayment , citing of banks in urban areas and high interest rates as charged by lending agencies (Kolawole, 2014). The poor access to credit has made processors to remain in small scale, as credit serves in payment of hired labour, procurement of material inputs and procurement of processing equipment and its accessories (Okonkwo; *et al;*2016). Also, in many subs – Saharan Africa, small scale gari processing equipment prevails and the major source of energy is through use of wood. This resource is often very scarce during the rainy season compare to the dry season as well because of being in competition with other household uses and bakery industries, leading to high cost of the resource (Ehiagbonairre, *et al* 2009). Variables that loaded under factor 2 (infrastructural factor) included; Shortage of material input (cassava roots)(0.432), high cost of transportation (0.368) and high cost of processing and storage equipment (0.450). The Shortage of material input (cassava root) for processors is more pronounced during dry season when the soil is too hard for harvesting of the roots, resulting in few roots harvests with high starch content and high cost of the resource. This compares to the rainy season, where harvests are plenty as the soil is very soft but with roots being more of high water and low starch contents (IITA, 2007). More so, the poor road network, high fuel and pump price could be responsible for high cost of transportation in the study area (Onunka, *et al*; 2017). Furthermore, on high cost of processing and storage equipment, the high Dollar – Naira exchange rate and economic meltdown in the country may be attributed to that (Ume, *et al;* 2014).

The socio/infrastructural factors (Factor 3) was high labour cost (0.409). Gari processor usually employ women and children especially in the area of peeling, sieving and toasting activities, who charges high in order to meet up with family responsibilities especially with economic meltdown the country is witnessing leading to low profitability by the processors (Okoronkwo, *et al*;2016). In addition, the unavailability of labour, could be explained by fact that women who may prefer engaging themselves in other farm activities that command high wages than in processing job that attract meager pay since child labour cannot be used as their close substitute (Kolawole, 2014). This means that any factor with variable loading of 0.3 and above are the important factor to be considered as serious factor militating against gari production in the study area.

V. CONCLUSION AND RECOMMENDATION

The results show that most gari processors were aged, fairly educated, well experienced, had high number of household size and membership of organization. In addition, the effect of cassava processing to the environments were littering of cassava peels, effluents, noise, fibrous waste and cyanide vapour and ash. Additionally, the determinant of processors' socio economic characteristics to the rate of environmental pollution were years of processing experience, membership of organization, level of education and access to extension services. Besides, gari processing is profitable in the study area with net profit of N65,050 and Benefit cost ratio of 1; 2;8. Furthermore, the constraints to gari processing in the study area were shortage of raw materials, high cost of labour, high cost of processing and storage equipment and high cost of energy.

Based on the results, the following recommendations were proffered;

1. There is need to ensure farmers' access to raw materials at cheap price through government support for cassava out growers through subsidizing their production with aim of supply these to the processors at cheap price.;
2. There is need to subsidizing the costs of processing and storage equipment for the processors by appropriate government agency concern.
3. There is need to enhance processors' access to credit from banks at collateral free condition in order to procure essential machineries and labour in accomplishment of their business without compromising to the environment.
4. Government must make positive steps in helping to construct good network road between intra rural and inter urban areas for ease of in and out flow of processing inputs and outputs,
5. There need to enhance processors access to education on free environmental processing technologies through workshops, conferences and adult education.(vi)Processors are advised to join cooperatives for training on capacity building of free environmental processing technologies and access to credit at reduced cost.
6. Extension agents should be adequately motivated to discharge efficiently their duties

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