

The Socio-Economic and Public Health Implications of Artisanal Crude Oil Refining in South-South States of Nigeria

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DOI: <https://dx.doi.org/10.47772/IJRISS.2024.808091>

Received: 07 August 2024; Revised: 19 August 2024; Accepted: 23 August 2024; Published: 31 August 2024

ABSTRACT

The federal, state, and local governments in Nigeria rely on oil revenues for about 90% of their annual export earnings. Despite the abundance of oil in Nigeria dating back to 1956, the country still struggles to meet the fuel needs of its citizens. Currently, the country's refineries are not producing anything, leading to the emergence of artisanal refineries in oil-producing states and communities to fill the gap in petroleum products. This situation presents various socio-economic and public health challenges. The study was conducted to evaluate the socio-economic and public health effects of artisanal crude oil refining activities in South-South Nigeria. Questionnaires were used to gather data from the communities and locals involved in artisanal refining activities and the questionnaire was distributed and retrieved from April, 2023 to November, 2023. A total of 1200 questionnaire were administered on community dwellers across the three states of Rivers, Bayelsa and Delta States in South-South Nigeria, however, 1140 of the questionnaires administered on community dwellers were returned. This implies that 95% of the copies of questionnaire administered were returned. The study results indicated that setting up an artisanal refinery typically takes one to two weeks, and the expenses for establishing one range from N201000 to N400000. Furthermore, the research highlighted that the economic benefits encompassed community development and sustenance of families, the study also reveals that there are several adverse environmental and health impact of artisanal refining of crude oil in the study area, study however recommends that there is need for a robust approach to crude oil refining locally.

Keywords: Socio-Economic, Public Health, Artisanal, Crude Oil, South-South, Refining

INTRODUCTION

Fossil fuel has been crucial to the world's economic well-being as it's consumption and wide usage has over the years become widespread, it's usage are not just for the production of energy but also for industries such as manufacturing, transport, agriculture, and even in the building construction. International firms and other related services providers has nonetheless recorded appreciable growth as a result of the enormous potential of the exploration and exploitation of fossil fuel and its related derivatives (Majekodunmi, 2013). It is estimated that about two hundred (200) firms operates globally within the oil and gas field and there are increasing number of subsidiaries and smaller oil servicing businesses (Elenwo, and Urho, 2017). Shell, Exxon Mobil, Total, and Chevron, among others are considered as the major players in the oil and gas industry. These multinational oil companies are now well-known brands in the global oil economy (Babatunde, 2012). The exploration and exploitation of the fossil fuel by these big multinational companies has significantly impacted the world's economy with their activities resulting to climate change and environmental degradation from oil pollution and emissions of Green House Gases.

Following the discovery of commercial deposit of crude oil in Nigeria in 1956 at Olobiri, present day Bayelsa State in South-south, the commercial exportation of crude commenced three years after (Agoha, 2019; Akpan-Idio, Ibrahim, Udo, 2012), subsequently, Nigeria joined the big crude oil producers in Africa becoming one of the biggest producers of crude in Africa (Albert, Amaratunga, Haigh, 2018; Olujobi & Ousola-Olujobi, 2020) and having one of the largest reserve of natural gas in Africa (Gungah et al., 2019), and in 1971 Nigeria joined

the Organisation of Petroleum Exporting Countries (OPEC) as its 11th member (Itsekor, 2020) with an average daily production capacity of about 2.5 million barrels (Babatunde, 2020) making Nigeria's economy to majorly depend on foreign exchange from the trade of crude oil (Olalekan and Adebisi, 2020). Bodo & Gimah (2020) claimed that approximately 90% of Nigeria's foreign earning comes from crude oil sales.

Ironically, despite the fact that Nigerian economy depends largely on crude oil export, it has not been a remarkable development and regional prosperity in the South-South region of Nigeria where almost all the exploration and exploitation activities are carried out, according to Gundlach et al. (2021). Therefore, this study assessed the socio-economic and public health implications of artisanal crude oil refining in south-south states of Nigeria.

Crude Oil Refining in Nigeria

For the purpose of crude oil refining in Nigeria four refineries are owned by the national National Petroleum Company Limited, with an estimated total refining capacity of 445,000 barrels per day (Kadafa 2012; NNPC 2016; Majekodumi 2013). The Port Harcourt Refining company is has two refineries; the first, commissioned in 1965, was built with an on-stream capacity of 60,000 barrels of light crude per day, and the second refinery, which was commissioned in 1989, was built with a refining capacity of 150,000 barrels of crude oil per day (Olalekan and Adebisi, 2020; NNPC 2016; Kadafa 2012), Warri refining company and Kaduna refining company have one refinery each with installed capacities of 110,000 barrels, and 125, 000 barrels of crude oil per day (NNPC 2016), however, these refineries are said to be in a moribund state (Adegbite 2013).

Artisanal Refining of Crude Oil in Nigeria

Artisanal refining of crude oil is the basic refining of crude oil into gasoline, kerosene, and diesel in relatively small amounts for use in local markets (Nwajiaku-Dahou 2012 and Networks 2013). The process of artisanal refining uses crude oil as its feedstock, thus, unconventional refineries are built close host communities where crude oil flow stations and those with crude oil pipelines are running through in the South-South region of Nigeria, and the products such as diesel and kerosene from the artisanal refineries are sold in towns and villages (Ogbuefi 2014). Networks (2013) reports that artisanal refining camps along riverbanks store crude oil in drums made locally or in large holes dug in the ground covered in plastic and other synthetic materials to prevent leaks. Similarly, the EIA (2016) reported that artisanal refineries in the South-South swampy bushes refine crude oil and that the by-products of the refinement, like gasoline, kerosene, and diesel, are sold domestically and regionally at a lower price than government-recognized retail establishments. Figure 1 shows a typical artisanal crude oil refining site in a community in the South-South region



Fig 1: A typical example of an artisanal refinery in Delta State (Onyekakeyah, 2017)

The process of refining begins when the “black is heated in an oven, burning crude oil to start the distillation process, with most of the process kept cool through cold-water pumps and storage tanks” (Networks 2013). The product of each refining process depends on the refining method, with variations in the quality of products obtained, and to correct these variations the refiners sometimes mix kerosene with diesel to reach the product standard of large refineries (Networks 2013).

MATERIALS AND METHOD

This study adopted the survey research method and the data for the study were purposively obtained from primary and secondary sources. The primary source of data was obtained through structured and unstructured questionnaires, oral interview and inspection/personal observation, while the secondary data for this research work was collected from already existing body of literatures.

Population of the study

Total of 1184757 household in Rivers State, 674424 households in Delta State and 439172 households in Bayelsa State (Nigerian population commission (2006). To determine the household for each state, the household size as determined by the Nigerian population commission (2006) was used. This means that the total population of each of the affected local government was divided by 5 (representing the national household size).

The target population comprised of household with artisanal refinery sites and host communities across the various states of the study area (Rivers, Delta and Bayelsa States). The number of household that constitute the target population from which the appropriate samples were selected. To get the household size, the total population of the local government area was divided by 5 (the household size as determined by NPC, 2006).

The Taro Yamane formula was used to determine the sample sizes for each state. Hence, each state had a sample size of 400 each. The research instrument was administered on 400 heads of households in each study state within the study area.

Yamane formula as follows:

$$n = \frac{N}{1 + N(e)^2} = n = \frac{2298353}{1 + 2298353 (0.05)^2} = 400 \dots\dots\dots\text{equ (1)}$$

Where: n = sample size

N = Population size

1 = Constant

e = error limit or margin of error or level of significance (accepted error set at 5% i.e. 0.05)

Table 1 Sample Size Distribution across the affected Local Government Areas

STATES	LOCAL GOVERNMENT	2006 POPULATION	2020 POPULATION PROJECTED	HOUSEHOLD SIZE	SAMPLE SIZE
BAYELSA					
	Yenagoa	352285	475969	95194	87
	Southern Ijaw	321808	434792	86958	79
	Brass	184127	248772	49754	45
	Nembe	130966	176947	35389	32

	Ogbia	269588	364238	72848	66
	Ekeremor	179606	242664	48533	44
	Sagbama	186869	252477	50495	46
Total		1625249	2195859	439172	400
DELTA					
	Ughelli	166029	224320	44864	27
	Warri South West	116538	157453	31491	19
	Warri North	136149	183949	36790	22
	Burutu	207977	280996	56199	33
	Ughelli	302687	408957	81791	49
	Ndokwa	150024	202696	40539	24
	Warri South	311970	421500	84300	50
	Sapele	174273	235458	47092	28
	Isoko South	235147	317705	63541	38
	Ethiope West	202712	273882	54776	32
	Ughelli South	212638	287293	57459	34
	Warri North	136149	183949	36790	22
	Isoko North	143559	193961	38792	23
Total		2495852	3372119	674424	400
RIVERS					
	Degema	249467	337052	67410	23
	Ogba/Egba/Ndoni	283294	382756	76551	26
	Akuku Toru	161103	217664	43533	15
	Eleme	190194	256969	51394	17
	Gokana	233813	315902	63180	21
	Ahoda East	249232	336735	67347	23
	Tai	120308	162547	32509	11
	Bonny	214983	290461	58092	20
	Ahoda West	249232	336735	67347	23
	Oyigbo	125331	169333	33867	11
	Abua/Odual	282410	381561	76312	26
	Ikwerre	188930	255261	51052	17
	Etche	249939	337690	67538	23
	Obio/Akpor	462350	624677	124935	42
	Andoni	217924	294435	58887	20

	Emuoha	201057	271646	54329	18
	Port Harcourt	538558	727641	145528	49
	Ahoada East	166324	224718	44944	15
Total		4384449	5923783	1184757	400

Researcher’s Computations, 2024

RESULTS

Socio-Demographic Characteristics of Respondent

This chapter of the study presented and discussed the data generated from the field. The data used in this study included information generated via the questionnaire administration. On the other hand, a total of 1200 questionnaire were administered on community dwellers, however, 1140 of the questionnaires administered on community dwellers were returned. This implies that 95% of the copies of questionnaire administered were returned. The reasons for the non-return copies include poorly answered questions, defacement of the questionnaire by respondents. However, Soonk (2019) adduced that 95% of questionnaire return for a properly sampled population is adequate.

Table 2 shows the relevant demographic information of the respondents. As for the community dwellers, 53% were males while 47% were female. The age distribution for community dwellers showed that majority of the respondents fell between 25 and 44 years. This age category jointly represented 70% of the respondents at the community level. The community respondents that where single accounted for 42%, those married accounted for 38%, the divorced and widowed jointly accounted for 20%.

Table 2 Socio-demographic characteristics of Respondents

Categories	Affected community dwellers			
	Frequency	%		
Sex				
Male	604	53		
Female	536	47		
Total	1140	100		
Age Bracket (yrs)				
18-24	128	11		
25-29	164	14		
30-34	199	18		
35-39	182	16		
40-44	182	16		
45-49	173	16		
>50	112	10		
Total	1140	100		
Marital Status				
Single	481	42		
Married	425	38		
Divorced	119	10		

Widowed	115	10		
Total	1140	100		
Level of Education				
No Formal Education	343	30		
Primary Education	418	37		
Secondary Education	198	17		
Tertiary Education	181	16		
Total	1140	100		
Occupation				
Fisherman/Fisherwomen	167	14		
Trader	187	17		
Farmer	152	13		
Student	244	21		
Business	300	27		
Government Employee	90	8		
Total	1140	100		

Source: Researchers computation, 2024.

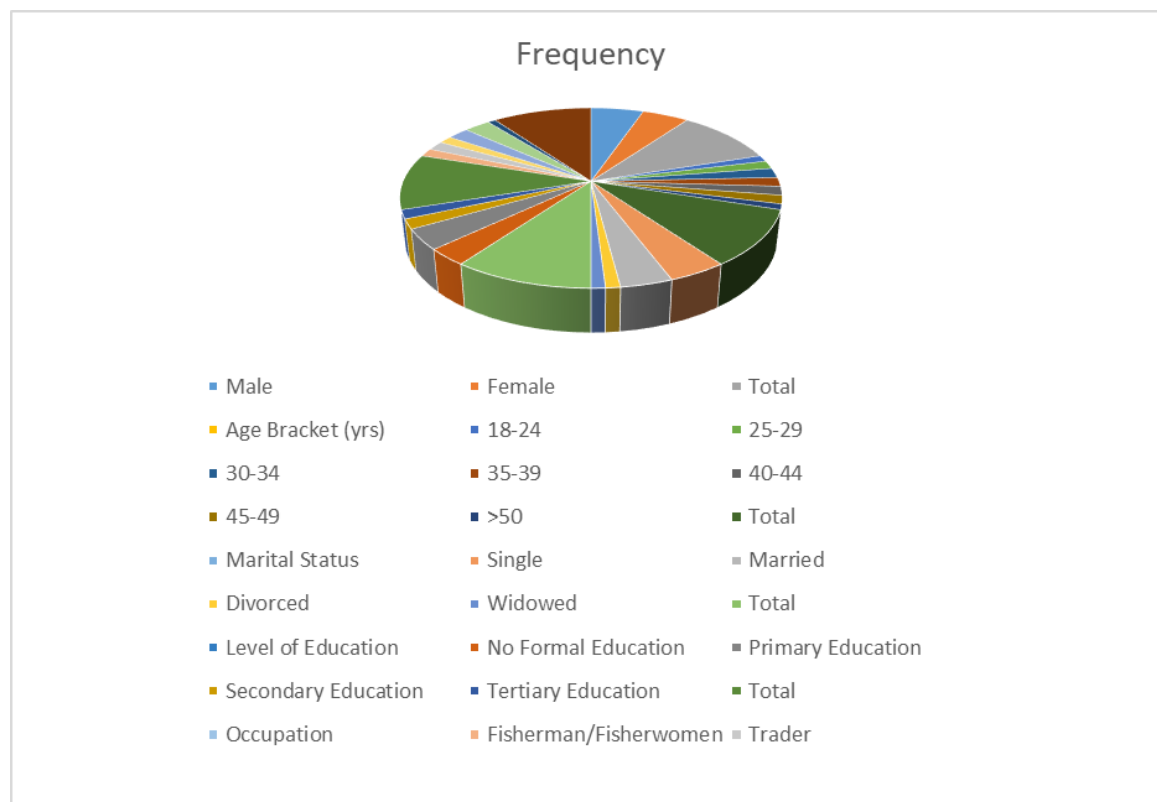


Fig 2: Showing Chart of Socio-demographic characteristics of Respondents

A close look as the data showed that education is a problem in the area. For the community dwellers, only 16% have any form of tertiary education. Contrariwise, 30% of the respondents do not even have any form of formal education at all. This shows the level of negligence of the affected areas when it comes to provision of adequate formal education. Sadly, this accounts partly for the rate of pipeline vandalism in the area (Yabrade

& Tanee, 2016). The occupation of the locals was revealed to include Fishing, trading, farming, business and government employs. Those who engage in business (27%) and those who are students (21%), shows that there possibly is a serious environmental problem. In a supposed rural environment, this is a dangerous development. The rural resources should be engaged, and agriculture and fishing should represent the activity that engages people more if the environments were favorable.

The effects of artisanal refinery on the environment, public health and the social-economic development of communities in the South-South Region.

The effect of artisanal refineries on the environment of the study area is presented in table 3. Conspicuous in the table is that all aspects of the environment have been affected by the activities of artisanal refineries. Most respondents (84%) agreed that artisanal refineries have reduced the farm lands in the area, 15% disagree that artisanal refinery has reduced farm lands and reduced harvest, while 1% is undecided. This finding agrees with that of Ogala (2013). Also, 73% of the respondents agreed that the activities of artisanal refineries have reduced the number of persons involved in fishing and farming in the area, while 21% of the respondents disagreed and 1% of them is undecided. Although 83% of the respondents agree that activities of the local refiners have improved the standard of living in the communities. Most of the respondents (78%) agreed that the activities of artisanal refineries have reduced the number of crop and trees in the area, 21% disagreed, while 1% were undecided. Yabrade and Tanee, (2016), averred that, not only does the spills from the crude methods of artisanal refineries affect land productivity and render crops unproductive, but also the process of artisanal refining include deforestation, thus reduces species of plants in the forests.

Most respondents (78%) agree that major source of water supply is polluted by crude oil waste from local refineries, 19% of the respondents disagree and 2% were undecided. The activities of local refining have also been identified to affect the air quality in the study area. Most respondents (83%) suggested that the air quality in the study area is affected always by the activities of the artisanal refiners in the area, 14% disagreed while 3% is undecided. Obviously, the locals are suffering from incidences of air pollution in the area. It is also lucid that air pollution from the activities of the artisanal refineries affects the quality of air they breathe there (72%). The species of fishes have also reduced. This assertion is agreed to by 72% of the locals. This partly explains the few numbers of respondents engaged in fishing in Table 3. In a supposed river dominated area there should be more persons involved in fishing as occupation.

Table 3 Effects of Artisanal Refining on the Environment

Effect of Local Crude Refining on the Environment	SA	A	D	SD	UND	Total	WA	Decision
Local refining activities have affected my community farm lands in reduced harvest	494	472	125	40	9	1140	4.22	Agree
	43%	41%	11%	4%	1%	100		
Activities of the local refiners have reduced the number of persons involved in fishing and farming	532	294	195	52	67	1140	4.02	Agree
	47%	26%	17%	4%	6%	100		
Activities of the local refiners have improved the standard of living in my community	478	463	113	56	30	1140	4.14	Agree
	42%	41%	10%	4%	3%	100		
The activities of the Local refiners have led to reduction in the number of crops and trees	438	455	165	75	7	1140	4.08	Agree
	38%	40%	14%	7%	1%	100		
The major source of water supply is usually	466	441	181	30	22	1140	4.13	Agree

polluted by crude oil waste from local refineries								
	41%	38%	16%	3%	2%	100		
Local Refining of Crude oil increases air pollution	518	438	114	41	29	1140	3.75	Agree
	45%	38%	10%	4%	3%	100		
People no longer farm or fish because of oil refining	414	411	243	58	14	1140	4.01	Agree
	36%	36%	21%	5%	1%	100		
Fish catch has also reduced drastically	424	410	280	14	12	1140	4.07	Agree
	37%	36%	25%	1%	1%	100		
The activities of local refining has affected the quality of air we breathe	412	411	291	17	9	1140	4.05	Agree
	36%	36%	26%	1%	1%	100		
The activities of local refining has negatively affected security situation of the environment	480	418	458	61	23	1440	4.9	Agree
	35%	31%	26%	7%	1%	100		
The Community drinking water source is polluted	466	441	181	30	22	1140	4.13	Agree
	41%	39%	16%	3%	1%	100		
The activities of local refiners have affected the mangrove resources of the community	467	513	93	53	20	1146	4.2	Agree
	41%	45%	8%	5%	1%	100		

Source: Researchers Computation, 2024.

N:B: SA-strongly agree; A-agree, SD-strongly disagree; D-disagree; UND-undecided; WA-weighted average.

Table 4 evaluated the effect of artisanal refineries on economy/ socio-economy development of the study area. 86% of the respondents agree that, artisanal refineries could be a source of revenue to the government, 12% of the respondents disagreed and 2% of the respondents were undecided. Many of the respondents (83%) agreed that money generated from artisanal refining has aided the development of the communities' economies, while 16% of the respondents disagreed. Majority of the respondents (88%) also agree that artisanal refineries sustain families in the study area, while 11% disagree. The weighted average of 4.3 affirms that most of the respondents do agree that the financial proceeds off artisanal refineries, sustains families in the study area. The respondents also agreed (79%) that there is need to allow the growth of artisanal refineries in the area. 20% of the respondents disagreed. The respondents that disagreed probably disagreed because of the current environmental consequences that are visible in the area (Obenade & Amangabara, 2014). The respondents disagree (weighted mean of 3.4%) that the activities of artisanal refiners are healthy to the people and their economy. 63% of the respondents agree that drilled operation has positive impact on the communities and 34% of the respondents disagreed. The indication is that the respondents did not entirely agree as a weighted mean of 3.4 was realized.

Furthermore, 84% of the respondents agreed that there is a difference between conventionally refined PMS and those from the artisanal refiners, and 13% disagreed. This means that the techniques of production are still primitive, and this makes the products produced substandard. The locals also affirmed that, kerosene derived from artisanal refineries have been responsible for wild fires and domestic fire incidences in the study area. This is hinged on the fact that 86% of the respondents agreed to the perception, that kerosene derived from artisanal refineries sometimes causes domestic fire accident. The information provided in table 3 points to the

fact that, there are aspects of artisanal refineries that benefits the locals, since it provides financial empowerment and security to those who participate in it. However, the effect of it on the economy is malicious since the products therefrom are sub-standard. This could affect engines of those who patronize them. Similarly, the locals' affirmation those, the kerosene got from artisanal refineries are sometimes substandard and responsible for fatal fire accidents, points to the fact that serious economic loss accrue from artisanal refineries too. So that, the primitive methods of crude refining in the study area needs a holistic review, for realization of sustainable economic advancement.

Table 4 Effects of Artisanal Refineries on the Economy/Socio-economic development

Perceptions	SA	A	D	SD	UND	Total	WA	Decision
Artisanal refining can be set as a means of generating revenue to the government	559	429	86	44	22	1140	4.27	Agreed
	49%	37%	8%	4%	2%	100		
The money generated from artisanal refining has aided the development of the communities' economy	453	486	128	57	16	1140	4.14	Agreed
	40%	43%	11%	5%	1%	100		
Artisanal refining is sustaining families financially	530	475	95	29	11	1140	4.3	Agreed
	46%	42%	8%	3%	1%	100		
There is need to allow the growth of artisanal refining in the region as modular refineries	439	459	144	84	14	1140	4.07	Agreed
	39%	40%	13%	7%	1%	100		
The activities of artisanal refiners is healthy to the people and their economy	285	437	290	102	26	1140	3.49	Disagree
	25%	38%	25%	9%	2%	100		
The drilled operation has a positive impact on the community	285	437	290	102	26	1140	3.42	Disagree
	25%	38%	25%	9%	2%	100		
The drilled operation has a Negative impact on the community	388	417	193	121	21	1140	3.9	Agreed
	34%	37%	17%	11%	1%	100		
There is a difference between conventionally refined PMS and those from the artisanal refiners	548	415	119	39	19	1140	4.25	Agreed
	48%	36%	10%	3%	2%	100		
Local refineries should be legalized and allowed to operate.	499	483	62	77	19	1140	4.19	Agreed
	44%	42%	5%	7%	2%	100		
Locally made Kerosene results in fire outbreak with fatal results.	482	504	70	66	18	1140	4.19	Agreed
	42%	44%	6%	6%	2%	100		

There is need to lobby the state/ national assembly members to legalize artisanal oil refining.	499	483	62	77	19	1140	4.19	Agreed
	44%	42%	5%	7%	2%	100		
Negative impact of oil refining can be mitigated by government ownership of artisanal refining.	459	493	129	36	23	1140	4.16	Agreed
	40%	43%	11%	3%	2%	100		
Private ownership of artisanal refining and regulation will moderate artisanal oil refining in the Niger Delta.	494	469	82	57	38	1140	4.16	Agreed
	43%	41%	7%	5%	3%	100		

Source: Researcher’s Computation, 2024.

N:B: SA-strongly agree; A-agree, SD-strongly disagree; D-disagree; UND-undecided; WA-weighted average.

Table 5 presented the public health implication of artisanal refineries in the study area. 82% of the respondents agreed that the illegal activities of local refiners affect the health of the people adversely and 11% disagree. 6% of the respondents were undecided. Overall, the weighted average of 4.06 affirms that the respondents agree. Similarly, the majority of the respondents (74%) agreed that the rate of cancer has increased in the area. In the same vein the majority of the respondents (75%) agree that respiratory disease cases have increase within the communities.

Most respondents (71%), agreed that water pollution from artisanal refineries is a source of sickness in the area, while 25% of the respondents disagreed. The respondents disagreed that soil pollution is the cause of the increase in sicknesses in the study area. This is because the weighted mean of 3.02 was realized. 79% of the respondents agreed that consumption of fishes caught from the artisanal refinery polluted steams in the study area is responsible for rise in the number of the sick persons in the study area, while 19% disagreed.

The information derived from table 5 is that, the processing of crude by the artisanal refineries have affected the area’s public health. The contamination of the lands, water and air, has a play back effect on the people there. Generally, when water is polluted with heavy metals, fishes in such rivers become sources of heavy metal poisoning. The same can be said of the plants and other edible resources got from the environment. In similar fashion, air pollution has a pervasive effect. It does not only cause new cases of respiratory diseases but can also trigger or worsen existing respiratory conditions. In all, the effects of artisanal refineries on the locals cannot be overlooked. It therefore implies that there is urgent need for the modification of approach of the production processes of artisanal refineries.

Table 5 Public Health Implication of Artisanal Refining

Perceptions	SA	A	D	SD	UND	Total	WA	Decision
The illegal activities of local refiners affects the health of the people adversely	504	430	82	50	74	1140	4.06	Agree
	44%	38%	7%	4%	6%	100		
The rate of those suffering from cancer has increased in my community	422	426	207	76	9	1140	4.08	Agree
	37%	37%	18%	7%	1%	100		
The rate of those suffering from respiratory diseases have increased in my community	521	332	171	102	14	1140	4.1	Agree

	46%	29%	15%	9%	1%	100		
The sickness common in my area is asthma	284	357	157	109	233	1140	3.1	Disagree
	15%	31%	14%	10%	20%	100		
Polluted water used is the major sources of sickness in the area.	429	379	196	90	46	1140	3.9	Agree
	38%	33%	17%	8%	4%	100		
Polluted soil is major source of sickness	229	379	196	200	136	1140	3.02	Disagree
	20%	33%	17%	18%	12%	100		
Breathing polluted air is the major source of sickness	229	379	196	200	136	1140	3.21	Disagree
	20%	33%	17%	18%	12%	100		
Crop produce from polluted farm cause sickness	441	200	150	98	51	1140	3.21	Disagree
	19%	22%	26%	9%	4%	100		
Fishes from polluted Rivers causes sickness when consumed	539	365	213	12	11	1140	4.23	Agree
	47%	32%	18%	1%	1%	100		
The people of the communities are more sick today than in the era before artisanal refining	300	230	181	240	189	1140	3.04	Disagree
	26%	20%	16%	21%	17%	100		

Source: Researchers Computation, 2024.

N:B: SA-strongly agree; A-agree, SD-strongly disagree; D-disagree; UND-undecided; WA-weighted average.

DISCUSSIONS

Respondents claimed that artisanal refineries have reduced the farm lands in the area, through spills and soil pollution. This finding agreed with that of Ogala (2013). This in turn accounts for the reduced number of persons involved in fishing and farming in the area. Also, a good number of crop and trees in the area were affected by artisanal refineries. Yabrade and Tanee, (2016), averred that, not only does the spills from the crude methods of artisanal refineries affect land productivity and render crops unproductive, but also the process of artisanal refining include deforestation, thus reduces species of plants in the forests. Furthermore, source of water supply are polluted by crude oil waste from local refineries. The activities of local refining were also identified to affect the air quality in the study area. Obviously, the locals are suffering from incidences of air pollution in the area. It is also lucid that air pollution from the activities of the artisanal refineries affect the quality of air they breathe there. These findings are in tandem with those of Asimiea and Omokhua (2013); Obenade and Amangabara (2014) who averred that the consequences of producing fuel from crude primitively, is pervasive on the environment as it affects the soil, water and atmosphere on one hand, and on the other hand the consumables of man are polluted and consumed by man, thus leading to proliferation in cases of terminal diseases.

The effect of artisanal refineries on economy/ socio-economy development of the study area revealed that, artisanal refineries could be a source of revenue to the government if properly harnessed. The money generated from artisanal refining is thought to aid the development of the communities' economies (host communities), while sustaining families. Thus, many respondents agreed that, there is need for a robust approach to refining locally. However a few respondents disagreed due to the current environmental consequences that is visible in

the area (Obenade & Amangabara, 2014). This is because both those that engage in artisanal refining and persons that reside close to production suite are unwell, despite the economic gains.

However, there is a difference between conventionally refined PMS and those from the artisanal refiners. This means that the techniques of production are still primitive, and this makes the products produced substandard. The locals also affirmed that, kerosene derived from artisanal refineries have been responsible for wild fires and domestic fire incidences in the study area. This is not good for both economy and safety of humans. The information provided points to the fact that, there are aspects of artisanal refineries that benefits the locals, since it provides financial empowerment and security to those who participate in it. However, the effects of it on the economy is malicious since the products therefrom are sub-standard, affects soil and water thus inhibiting agriculture. Also, engines of those who patronize them is constantly under repairs thus putting the vehicle owners at severe economic risks (Howard et al, 2021). Similarly, the locals' affirmation that, the kerosene got from artisanal refineries is sometimes substandard and responsible for fatal fire accidents, points to the fact that serious economic loss accrue from artisanal refineries too. So that, the primitive methods of crude refining in the study area needs a holistic review, for realization of sustainable economic advancement.

Also identified herein is that local refining affects the health of the people adversely causing or triggering respiratory disease cases within the communities. Again, artisanal refineries was identified to be a leading cause of source of sickness in the area. The contamination of the lands, water and air, has a play back effect on the people there. Generally, when water is polluted with heavy metals, fishes in such rivers become sources of heavy metal poisoning. The same can be said of the plants and other edible resources got from the environment. In similar fashion, air pollution has a pervasive effect. It does not only cause new cases of respiratory diseases but can also trigger or exacerbate existing respiratory conditions. In all, the effects of artisanal refineries on the locals cannot be overlooked. It therefore implies that there is urgent need for the modification of approach of the production processes of artisanal refineries (Al-Turki, 2010).

RECOMMENDATION

Oil companies operating in the region in collaboration with government should increase their corporate social responsibility through the encouragement and support the development and expansion of the local economy for rural inhabitants in the state such as provision of social and welfare amenities, companies (to engage youths).

There is need to improve on the soil and water quality of the area, through remediation. This should be done by both government and oil companies that have installation in the area.

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