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Awareness and Perception of Undergraduate Students in Osun State About Gas Flaring and its Impact in Nigeria

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Abstract: ***Flaring of gases associated with petroleum exploration and production in Nigeria's Niger Delta has continued to generate complex consequences in terms of energy, human health, natural environment, socio-economic environment and sustainable development. Gas flaring has been criticized strongly in different countries around the world, yet it is still practiced in Nigeria. Since these practices affect the nation's economy, everybody irrespective of region is considered to be a stakeholder and therefore should be aware of the consequences and implications of these practices. The study focused on the awareness and perception of undergraduate students in Osun state about gas flaring and its impact on the environment and economy of the nation. Questionnaires were distributed to 500 undergraduates of two Universities in the south-western part of the Country. Data gathered were analyzed and presented using tables and percentages. Result of analysis shows that though about 63% of respondents are aware of gas flaring and its impact on the environment, about 53% of them believe that it is not a major issue and that it has been reduced if not totally stopped. The study concludes by recommending that undergraduates should be educated on current updates of environmental issues and its impact on the Nation at large.***

Keywords: Gas flaring, crude oil, natural gas, associate gases.

1. Introduction

Gas flaring is the burning of natural gas that is associated with crude oil when it is pumped up from the ground. In petroleum-producing areas where insufficient investment was made in infrastructure to utilize natural gas, flaring is employed to dispose of this associated gas while releasing emissions into the atmosphere. According to [1], Chemical factories, oil wells, refineries, rigs and landfills are sites of gaseous waste products and non-gaseous waste products which are also passed vertically through a chimney and burnt at its tip. Waste gases are flared because they are not useful or are difficult to store or because there are no standard infrastructure for storage of such gases, and non waste gases are burnt off to protect equipment. Poor efficiency of flare systems in the petroleum industry often result in incomplete combustion which produces a variety of volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs) and inorganic contaminants.

The flaring of petroleum associated gas has been dramatically curbed in developed countries around the world, For example, Norway has adopted flaring reduction measures and introduced a carbon tax, which penalizes companies for flaring or venting gas. However, Nigeria's penalty for gas flaring seems too low to either influence the practice or curb emissions. Gas flaring practices has been the preferred means of disposing associated or waste gas by various petroleum exploration and production companies operating in Nigeria's Niger Delta for the past five decades. However, re–injection of associated natural gas into the ground for potential future harvesting and liquefaction of natural gas for energy supply could [2], serve as an alternative means of disposal.

There have been series of government policy and regulations melted out to regulate gas flaring in Nigeria; this can be dated back to 1979, such as the 1979 Associated Gas Re-injection Act. In this Act, no oil company was permitted to flare gas after January 1984 without ministerial authorization. However, these flaring policy and regulations were not properly enforced, and Nigeria flares over 75 % of the associated gas it produces and this represents a pollution equivalent to 45million tons of CO_2 per day. Currently, there are over 123 flaring sites in the Niger Delta region and Nigeria has been regarded as one of the highest emitter of greenhouse gases in Africa [3].

Nigeria as a nation is reputed as a major oil producer. In addition, the nation's hydrocarbon reserve features more gas than crude oil. Estimated at 185 trillion cubic feet, Nigeria's natural gas reserves are rated as the seventh in the world and the largest in Africa [4], Nigeria flares 17.2 billion m3 of natural gas per year in conjunction with the exploration of crude oil in the Niger Delta [5]. The nation's gas reserve is distributed between associated gases and non-associated gas. Flaring of this associated gas contributes to emissions of carbon monoxide, Nitrogen (II) oxide and methane which are estimated between 1 to 4%, of the total emissions from all sources of noise, unwanted heat and light, affecting nearby communities and surroundings flora and fauna.

The environmental and human health of the people in the Niger Delta region has frequently been a tertiary consideration for the oil companies. Neither the Federal Environmental Protection Agency (FEPA) now nor the Department of Petroleum Resources (DPR) has implemented anti flaring policies for excess associated gases nor have they monitored the emissions to ensure compliance with standards since 1988[5].

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[6] reported that 56.6 million m^3 of associated gas is flared daily in Nigeria. The effects of gas flaring in the Niger-Delta region is very clear in terms of its negative effect on the region. Gas flaring which has been in practice for over the last four decades has not only impacted disastrously on the socio- physical environment of the Niger-Delta oil bearing communities but also on the socio-economic status of the nation at large.

The need to protect our environment is pertinent. There is need for environmental education as a weapon that could be used by the nation to arouse people's consciousness. The public therefore, has the right to access environmental information held by public authority [7]. Information about the environment should be made part of the courses taught in both science and non science fields in the universities.

[8], they pointed out that there is need for environmental campaign across- the –board; he also noted that, environmental education will enlighten not only those in the grassroots but all other citizenry, government agency, industries and so on. In addition to this, environmental awareness programme is at dismally low level among Nigerians. Recognizing the enormity of this threat to the society, the researcher deemed it fit to carry out this study which cardinally sought to finding out the extent of the awareness knowledge of undergraduate students of the south-western part of the country on gas flaring and its impact in Nigeria.

2. Materials and Methods

The study adopted a questionnaire survey research design. The questionnaire was designed by the researcher and subjected to validation for both internal and external consistency. The reliability coefficient of 0.67 was obtained when the instrument was administered to initial respondents of 50 undergraduates not included in the main study. The questionnaire consisted of two sections; section 1 depicted information about the respondent's gender, field of study, academic qualifications, department and name of institution. Section 2 consisted of questions on awareness (1, 2, 4, 5,7 and 14) and knowledge (3,6,8-15). The main data for the study was collected by distributing questionnaires randomly among undergraduates from two universities in Osun state in the South-western part of Nigeria. Questionnaires of 500 respondents comprising of male and female, science oriented and non science oriented undergraduates were collected for analysis. The data were analyzed using simple percentage and chi square to answer the research questions generated in the study.

3. Results and Discussion

In terms of respondents according to sex, out of 500 respondents, 265(53.0%) males and 235(48.8%) females participated in the research exercise. According to Fields of study, 384(69.6%) of the respondents were Science related fields, while 152(31.4%) were non-Science related fields.

Research Question 1: What is the level of awareness of gas flaring among undergraduates in osun state?
Research Question 2: What is the knowledge and perception level of undergraduates in Osun state on gas flaring and its impact in Nigeria?
Research Question 3: Does the level of awareness and knowledge of science undergraduates differ significantly from that of their non-science counterparts?

Table 1: The level of awareness on gas flaring among undergraduates in Osun state

	Questions	*Yes*		*No*		*Total*	
		F	%	F	%	F	%
1	I'm aware of what gas flaring is all about	315	63.0	185	37.0	500	100
2	Gas flaring is practiced mainly in the south-south region of the country	208	41.6	292	58.4	500	100
3	Gas flaring is the burning and release of associate gaseous waste product into the atmosphere	419	83.8	81	16.2	500	100
4	Gas flaring is the burning of gas to cook	182	36.4	318	63.6	500	100
5	Gas flaring only features in petroleum industries	209	41.8	291	58.2	500	100
6	Gas flares contain mostly Carbon monoxide and gaseous hydrocarbons	451	84.2	79	15.8	500	

Source: Field survey 2014

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Table 2: The knowledge and perception level of undergraduate on gas flaring and its impact in Nigeria

	Questions	*4* **Yes**		*3* **No**		*Total*	
		F	%	F	%	F	%
3	Gas flaring is not a major issue in Nigeria	267	53.4	233	46.6	500	100
6	There are no risk associated with gas flaring	92	18.4	408	81.6	500	100
8	Gas flaring is of no significant impact on the environment	161	32.2	338	67.6	500	100
9	There is no way of controlling gas flaring	141	28.2	359	71.8	500	100
10	Gas flaring can be contained if laws of restrictions are enforced	412	82.4	88	17.6	500	100
11	Gas flaring is a significant source of air pollution	421	84.2	79	15.8	500	100
12	Flaring of associated gas emits greenhouse gases into the atmosphere	319	63.8	181	36.2	500	100
13	Gas flaring has been stopped or reduced in Nigerian oil and gas industries	202	40.2	298	59.6	500	100
14	The issue of gas flaring has no socio-economic impact in Nigeria	212	42.4	288	57.6	500	100
15	Gas flares have impacts on plants, human and animals	359	71.8	141	28.2	500	100

Source: Field survey 2014

Table 3 shows that Sig t (.002) <α(0.05), the knowledge level of science undergraduates differ significantly from those of their non-science counterparts.

Table 3: Test Statistics to show the variance in knowledge and perception level of science undergraduates and their non-science counterparts

	The knowledge level of science undergraduate differ significantly from those of their non-science counterpart	
p-val	Degree of freedom	Sig. level at ≤ 0.05
156.3.	369.881	.002

Level of Significance = 0.05

The result on the level of awareness of undergraduates on gas flaring shows that majority (63%) of the respondents are aware of what gas flaring is all about. Also, most of the undergraduates (84%) are aware of the components of the gases being flared. However, close to half of the respondents (41.4%) are not aware that majority of the gas flaring activities occur in the south-south region of the country.

Furthermore, a thing of concern is the result that revealed that although about 67.6% of respondents believe that gas flaring is of significant impact to the environment and about 81.6% attest to the fact that there are health risks associated with gas flaring, about 53.4% of the respondents believe that gas flaring is not a major issue in Nigeria. Moreover, majority of the respondents believe that gas flaring can be contained and controlled, an alarming 40.2% believe that gas flaring has been stopped or reduced to minimum in Nigerian oil and gas industries. Also, about 42.4% believe that gas flaring has no socio-economic impact in Nigeria. This believe also contradicts the findings of Ubani and Onyejekwe (2013) that gas flaing is still much in practice with Nigeria having about 123 flaring sites in Niger delta region. In general, undergraduate students of Osun state in the south-western part of Nigeria are moderately aware of gas flaring activities in Nigeria. However, their knowledge and perception about the impact of gas flaring on the host community and on the socio-economic status of the country is quite low. Moreover, the awareness and perception of science undergraduates differ significantly from their non-science undergraduate counterparts on environmental issues of gas flaring and its impact in Nigeria. Hence, it is recommended that updates on environmental issues should be made part of the curriculum packages for undergraduates all over the country irrespective of their field of study.

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