Environmental quality perception and management in industries in Ondo state, Nigeria

Afolabi Francis FATUSIN

Adekunle Ajasin University, Nigeria

Abstract: There is a direct correlation between the state of environment and environmental quality perception of individuals residing in the geographical entity. This study, working on the assumption that the more the awareness of quality environment the more the tendency to improve it examined the perception of entrepreneurs of industries and residents on the state of environmental management among 200 industries in Ondo state and 172 residents living within 100 meter radius to the sampled industries who were interviewed with different sets of questionnaire. Data collected were analysed using tables and charts. The mean weighted value (MWV) of each category of responses was compared with the group mean weighted value (GMWV) to isolate the most important responses. The study discovered that majority of proprietors, being lowly educated disposed wastes using crude means like burning (57%), burying (23%), disposing in the bush. (12%) and in drainages (11%). Out of the 200 residents sampled majority 87.2% (191) believed they were injuriously affected by the operation of adjoining factories. Moreover there existed a discrepancy of opinion among proprietors and people living nearby on the assessment of environmental management technique adopted in managing wastes. The paper posited that poor judgment by proprietors, inertia by government supervisory agencies, dirty attitudes of people and poor education among proprietors were the most important responses of people on reasons for poor state of waste management. The paper concluded that right perception of the problem through improved environmental education is essential for sustainable solution to wastes management in industries.

Keywords: Environmental Management, Wastes, Industries, Proprietors, Perception, Environmental quality
JEL code: Y

1. Introduction

The issue of sustainable environment has always occupied the minds of environmentalists in the world over. The Rio earth conference of 1991 along with previous agreements and protocols provided the world with environmental standards with which to operate in any developmental

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project. Indeed the renewed emphasis on Environmental Impact Assessment before development can be approved and the willingness of many Non-Governmental Organizations to provide resources especially to developing countries to fund environment based projects is a pointer to the fact that the issue of environment has been brought to the front burner of world attention

In Nigeria as in many developing countries the attitudes of the governments have been weak, pro inertia and vague when it comes to the issue of environment. Pallen (2006). That is why there was no provision for environmental protection in the First and Second National Development Plans. Indeed there was a careless assumption that large scale industries, because of their massive inputs and outputs have more potential to degrade the environment than small scale industries which according to Akinbinu (2001) accounted for 80% of industries in Nigeria. However recent studies such as Scott (2006), Mcintouch (2010) have pointed otherwise.

Perhaps, one of the major flaws in Nigeria industrialization drive was the over emphasis on temporal growth of industries to the detriment of environmental consequences. Even when a particular industry was known to pollute the environment more than the acceptable limit by the Federal and states Ministries of Environment, governments and agencies at all levels were reluctant to enforce compliance, perhaps out of fear that stringent enforcement many stiffen the already weak industrial sector, and might lead to collapse of firms thereby endangering economic growth which according to Adeboye (2003) was the priority of government

However the Federal government of Nigeria promulgated the Federal Environmental Protection Act in 1975 which made provision for environmental protection of flora and fauna resources and specifically made preparation of Environmental Impact Assessment a precondition for any development especially manufacturing enterprises. The FEPA Act was however repealed and its functions transferred to Federal Ministry of Environment in 2008.

Nevertheless, though previous studies such as Al Hassan (2004) have established Nigeria's parlous state of waste and environmental management especially among manufacturing industries in spite of the various laws and conventions in which Nigeria is a signatory, attempts at investigating the problem of ineffective wastes management have concentrated on the impacts with little studies on the causes which may be related to the perceptions proprietors of industries and residents of the areas where plants are located. This has provoked an examination of the quality of environmental perception in Nigeria since human factor is absolutely important for the success of any programme. In this wise the question is that, is the parlous state of environmental

management among proprietors of manufacturing enterprises, fallout of low appreciation of the value of quality environment? How then can we improve environmental perception index among proprietors so as to improve the parlous state of the environment especially wastes management.

2. Literature review

Environmental quality perception is a growing field of research among geographers, planners, sociologists, psychologists and other scholars who are interested in environmental management. Perception in Psychology refers to a particular belief, assumption proven or unproven which may be based on experience or not. Perception according to Cherry (2014) is human sensory experience of the world around and involves both the recognition of environmental stimuli and actions in response to these stimuli. Through the perceptual process, we gain information about properties and elements of the environment that are critical to our survival. Perception not only creates our experience of the world around us; it allows us to act within our environment. Perception can also be defined as our recognition and interpretation of sensory information. Perception also includes how we respond to the information. We can think of perception as a process where we take in sensory information from our environment and use that information in order to interact with our environment. Perception allows us to take the sensory information in and make it into something meaningful. (William 2012)

According to Bechtel (1976) there is an increasing interest on perception as it relates to environmental quality. Prior to this movement, perception and perceptual studies focused on elements general to all environments, such as depth, color, texture, mobility, and other universal features. According to him, the new emphasis seeks to focus on specific aspects of the environment that are related to man's welfare. If these specific aspects are rated high, we say the environmental quality is, therefore, high; if rated low, then the environmental quality is low. It is on this basis that this study examines how the stakeholders in industries perceive their actions in term of environmental quality management in their plants relative to human ideals of welfare.

The literature on need for quality environment is centered on Sustainable Development. Sustainable development is based on the principles of self-reliance (Clayton 2001), fulfillment of basic needs and an emphasis on the quality of life. The concept of sustainable development gives an affirmation of the concern for the World's poor and "the integrity, and stability of ecosystem
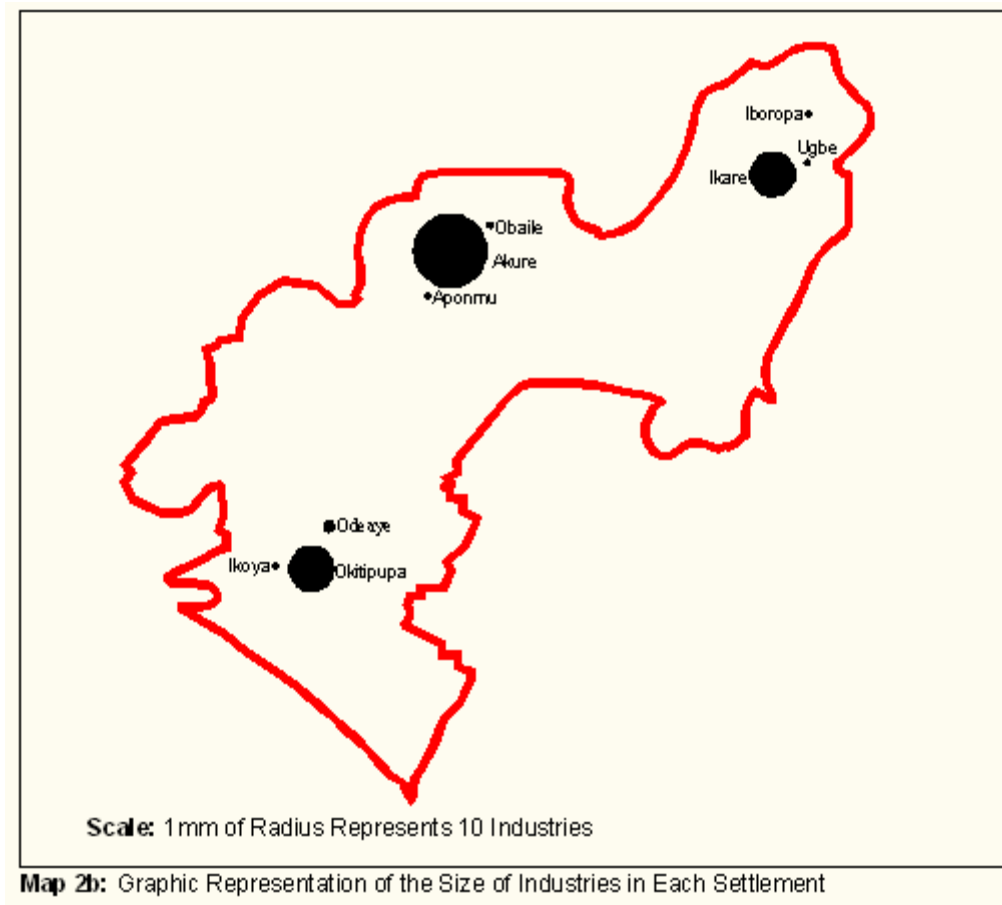
and the imperatives of social justice" (UNIDO, 1991). It further recognizes that poverty, environmental degradation and population growth are inextricably related and that none of these fundamental problems can be addressed in isolation" (Johnston 2007). In effects sustainable development emphasizes development strategies that are geared towards the proper management of natural and human resources as well as physical assets for "increasing long term health and well-being", rejects policies and practices that support current living standards depleting the productive base, including natural resources and then leave future generation with poorer prospects and greater risks than our own. Small scale industries are well fitted into this lofty objective. Manufacturing enterprises are required to promote this concept in the process of wastes management which according to Ajibefun and Daramola (2003) is poor in Nigerian industries.

3. Materials and method

Ondo state lies between latitudes 5"45' and 7°52'N and longitudes 4°20' and 6° 05'E. Its land area is about 15,500 square kilometres. The State is bounded on the east by Edo and Delta states, on the west by Ogun and Osun States, on the north by Ekiti and Kogi States and to the south by the Bight of Benin and the Atlantic Ocean. The apex of the administrative structure is the state headquarters, Akure. Prior to the carving out of Ekiti State from Ondo State there were twenty-six Local Government Areas (LGAs). Fourteen of these remained in Ondo State, and from these, additional four LGAs were created. Currently, there are eighteen LGAs in Ondo State. An important aspect of the administrative set-up of Ondo State is the recognition of four subordinate area authorities. These are areas having some recognised autonomy within their LGAs. Besides, Ondo State is carved into 18 Local Government Areas and three Senatorial Districts or regions. Ondo state boasts of agriculture based economy, but small scale industries, especially informal industrial enterprises have grown lately

The study covered all the three senatorial regions of the state – Ondo North, Ondo Central and Ondo South. The sample frame covered all the industries in the nine settlements (as shown in Map1) selected in the study area.

Figure 1. Sampled Settlements and their size of Industries in Ondo State

Scale: 1mm of Radius Represents 10 Industries

Map 2b: Graphic Representation of the Size of Industries in Each Settlement

Source: Field work 2015

A sample of 200 industries were taken for investigation.Two different types of questionnaires were administered on proprietors of industries and people living within100m radius of selected industries in each town which were first identified and numbered during reconnaissance survey. Data were analyzed by using simple tables, Bar graphs and mean weighted values. The mean weighted value (MWV) of each category of response was compared with the Group mean weighted value (GMWV) to isolate the most important responses of those interviewed. Any category of response whose Mean weighted value is higher than Group mean weighted value is taken as being significant and accepted and vice versa.

4. Findings

Environmental Management Approaches Adopted By Factories Owners

The environmental management techniques adopted by factories owners are related to their perception of the problem which also has a lot to do with the level of their awareness or education. Majority of factories owners dispose of their wastes through crude methods by burning (57%), followed by burying (23%), disposing in the bush (12%) and drainages(11%) yet countries like USA and Britain over 23% of wastes are recycled for further uses. These methods are not environment friendly (Akeredolu, 2004, Fatusin et al 2006, Fatusin 2012)) and are related to their low level of education. An examination of the level of education among the proprietors show that some 32% of them have just primary education 34% with secondary education and only 12% had tertiary education. They therefore did not see these methods as being unhealthy.

Pattern of Discomfort Caused by Industries

Before evaluating the perception of relevant stakeholders it was necessary to investigate the state of environmental management in the study area. One hundred and eighty three (183) proprietors of industries out of the 200 sampled who believed they were being injuriously affected by their operations were asked to identify the pattern of discomfort/wastes caused by their industries in the neighbourhood. The results as shown in table 2 revealed that majority of the enterprises 31% (61) of the 183 firms constituting 11% (24) in Ondo North, 31% (29) in Ondo Central and 39% (21) in Ondo South picked solid wastes like garbage and thrash. Other significant responses included 27.7% (53) made up of 22% (10) in Ondo North, 25% (23) in Ondo Central and 37% (20) in Ondo South who picked vibration of machines in industries as the most nauseating problem. Smokes constituted 22.5%, while liquid wastes and noise were the most nauseating pollution problems accounting for 13% each. The pattern of responses and the regional variation is shown in table 1.

Table 1. The Structure of Wastes Generated

Effects	Frq	%	Ondo North	%	Ondo Central	%	Ondo South	%
Vibration	53	27.75	10	22.22	23	25	20	37.04
Solid W	61	31.94	11	24.44	29	31.52	21	38.89
Liq. W	13	6.81	3	6.67	6	6.52	4	7.407
Smoke	43	22.52	16	35.56	21	22.82	6	11.11
Noise	13	6.81	2	4.44	9	9.78	2	3.704
	183	95.81	42	93.33	88	95.65	53	98.15

Source: Fieldwork, 2015.

Environmental Quality Perception of Small Scale Industries by Residents and Proprietors

Environmental impact of industries was investigated on residents of places where industries were located. There was indeed the general perception among residents who lived close to small scale industries that the operation of the enterprises did cause them some discomfort. Out of the 200 residents sampled 87.2% (191) believed they were injuriously affected. Only 12.7% (28) believed the operation of the enterprises were not causing them any discomfort (see fig. 2).

Figure 2. Regional Perception of Residents on Possibility of Being Affected by the Operation Industries
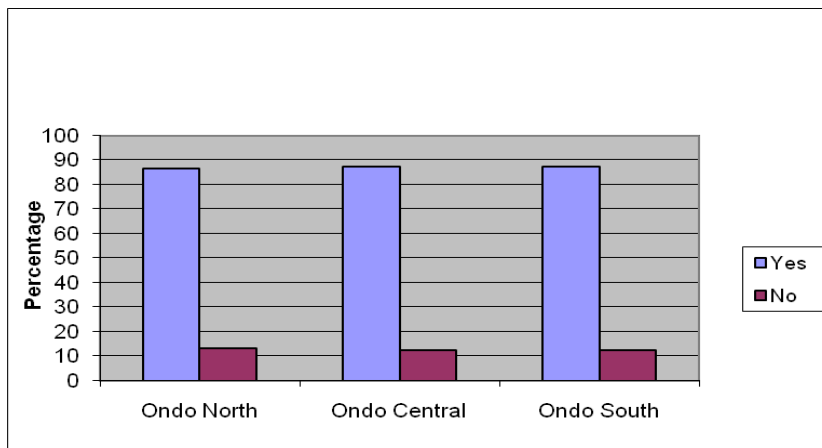
Source: Fieldwork, 2015.

However, there was a noticeable difference in the responses of residents living near the two broad classes of industries. For example out of the191 respondents who believed the operations of the

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adjoining industries were causing them some discomfort, 91% (174) lived close to informal/ small scale enterprises comprising of, 51(29.3%) in Ondo North, 68(39.1%) in Ondo Central and 55(31.6%) in Ondo South. Only 8.9% (12) of the respondents lived close to large scale industries mainly in Ondo Central with 11 of such respondents representing 64.5% of the total, increasing further in Ondo North and Ondo South with 23.5% and 11.7% of the respondents (See fig.1). This is not surprising considering the fact that small firms never really did subject themselves to controls and so many did not adopt stringent environmentally friendly practices which a formally registered firm might be forced to adopt. In fact, many informal enterprises were located right inside the residential areas (28%) where their impacts were felt most by residents in such buildings and beyond.

An assessment of the perception of proprietors and residents on effectiveness of environmental management techniques adopted by them was done. The results show that there were divergent views between the two groups.

Table 2. Perception of Residents on Effectiveness of Proprietors Waste Management Approaches

	SA	A	DA		SD	Total		MWV	
Excellent	80	46	42		32	200	574	2.87	Rej.
V Good	53	81	26		40	200	547	2.735	Rej.
Good	117	48	25	10		200	672	3.16	Rej.
Average	135	40	12		13	200	697	3.485	Sig.
Poor	155	35	4		6	200	739	3.695	Sig.
Total	540	250	109		101	1000	3229	3.229	

Source: Fieldwork 2015

The result as shown in Table 2, revealed that in the perception of residents, proprietors waste management efforts were poor to average with the most significant response being poor (Mean weighted values higher than the Group mean weighted value).

Table 3. Proprietor's self-assessment on environmental management

	SA	A	DA	SD	Total		MWV	
Excellent	158	30	5	7	200	739	3.695	Sig.
V Good	123	42	27	8	200	680	3.4	Sig.
Good	135	29	19	17	200	682	3.41	Sig.
Average	93	32	39	36	200	582	2.91	Rej.
Poor	58	86	18	38	200	564	2.82	Rej.
	567	219	108	106	1000	3247	3.247	

Source: Fieldwork 2015

Having understood the perception of people living close to industries on environmental management by proprietors, it was also important to investigate the perception of proprietors themselves and so they were asked what constituted their own definition of an ideal environment. Responses varied from pollution free environment (31%), Noiseless environment (25%), Industrial accident free environment (21%), and smokes/odour/dust free environment (14%). Others had no opinion.

Proprietors were asked to assess themselves on management of their environment. The result shows there is discrepancy in the responses of the two categories of stakeholders. Most proprietors scored themselves high in the management of their wastes and in eliminating discomforts caused by their industries as shown in table 3. Proprietors scored themselves excellent, very good and good (Mean weighted values higher than the Group weighted value) However when the proprietors were asked of their efforts at controlling the wastes generated in their factories, only 22.2% have a formalized waste management policy and 3.2% waste management department. Reasons given which may not be cogent enough considering the enormity of the challenges are summarized in table 4.

Table 4. Some Proprietors Reasons for Poor Wastes Management Technique

S/N	Responses	No.	%
1.	Mine is a small scale industry	66	35.6
2.	Lack of support from government	54	29.1
3.	Nowhere to dispose the waste	31	16.8
4.	I do not generate wastes	34	19
	Total	185	100

Source: Fieldwork 2015

Table 5 indicates that over 35% of proprietors believed that theirs being small scale industries they don't need any wastes management effort. 29% gave lack of support from Government while 34% indicated they don't generate wastes which may be practically impossible.

The study proceeded to investigate the reasons attributable to poor state of environmental management among 172 residents among the 200 sampled who believed the operation of adjoining industries have caused them some discomfort. The Mean Weight Values (MWV) for the responses and the General Mean Weight Value (GMWV) or for this grouped responses were calculated. In so doing, only four factors out of the five listed factors were accepted as significant.

Table 5. Reasons given by Residents for Poor Wastes Management in Industries

	SA	A	DA	SD	Total		MWV	
Poor judgment by Proprietors	104	28	22	18	172	716	4.162791	Sig.
Poor funding of waste management Authority	81	38	30	23	172	670	3.895349	Rej
Inertia by government supervisory agencies	106	36	13	17	172	730	4.244186	Sig.
Dirty attitudes of People	105	37	15	15	172	733	4.261628	Sig.
Poor education among Proprietors	100	38	19	15	172	724	4.209302	Sig.
	496	177	99	88	860	3573	4.154651	

Source; Fieldwork, 2015.

From table 5 above, causes such as poor judgment by proprietors, inertia by governments supervising bodies, dirty attitudes by people and poor education of proprietors were accepted because their respective Mean Weight Values of 3.40, 3.73 and 3.61 are greater than the Grand Mean Weight Value 3.28. Out of these major causes explained above it is necessary to emphasize that the most significant response was dirty attitude among residents which also included the proprietors workers and even those living nearby. Proprietors poor education is supported by table 1 which shows that over 71% of them possess only primary to secondary education with little knowledge of waste management systems which affects their perception of the problem.

The residents were further asked to state their perceived solution to the problem of poor waste management which has impacted on them. The responses given are shown in table 6.

Table 6. Perceived Solution to the Problem of Waste Management

	SA	A	DA	SD	Total		MWV	
Recruitment of more staff by waste management authority	34	54	66	18	172	602	3.5	Rej
Recycling of wastes	45	38	55	34	172	576	3.348837	Rej
More enforcement	49	35	66	22	172	605	3.517442	Rej
More enlightenment of proprietors	105	37	15	15	172	733	4.261628	Sig.
Improved city governance and planning	100	38	19	15	172	724	4.209302	Sig.
	333	202	221	104	860	3240	3.767442	

Source: Fieldwork 2015

It is very important to state that while all of these causative factors have contributed one way or the other to environmental management crises in Nigeria plants today, three factors out of the five listed factors whose MWVs are greater than the GMWV were accepted as significant perceived solutions. These are more enlightenment of proprietors on importance of effective and efficient waste management, and improved city governance and town planning to improve supervision and enforcement of acceptable standards in waste management.

5. Summary and conclusion

This study has been concerned with investigating the perception of two stakeholders - plant owners and residents of the areas where factories are located on factory derived waste management problems in Ondo state. Efforts were made to investigate the state of waste generation and management which the study confirms is appalling in the state. The study set out to investigate how these stakeholders perceived this problem on the premise that the more awareness these stakeholders have of this problem the more efforts will be made to solving it. The study discovered that wastes mostly generated were solid wastes (31%) and were disposed of using crude methods such as burning (57%), burying (23%), disposing in the bush. (12%), and drainages (11%). Out of the 200 residents sampled, gross majority 87.2% (191) believed they

were injuriously affected by the operation of adjoining industry. Moreover there existed a discrepancy of opinions among proprietors and people living nearby on the assessment of environmental management technique adopted in managing wastes. While the proprietors themselves saw these methods as being good the residents believe the methods were not working. The study also sought to investigate reasons for the poor waste management in these industries, and significant perceived reasons included: Poor judgment by Proprietors Inertia by government supervisory agencies and Poor education among Proprietors. Yet the perceived solution included more education and enlightenment of proprietors and improved city governance and planning.

The study posits that right perception of Industrial wastes management among the stakeholders such as the proprietors themselves and the residents and government forming a synergy is essential for articulation of sustainable solutions to the problems of industrial wastes generation and management in Ondo state. Therefore efforts should be made to improve their perception index through education and training of proprietors.

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Postrzeganie i zarządzanie jakością środowiska w przemyśle w stanie Ondo w Nigerii

Streszczenie

Pomiędzy stanem środowiska a postrzeganą jakością środowiska występuje różna korelacja, w zależności od geograficznego umiejscowienia jednostek. Niniejsze opracowanie omawia wyniki badań, zakładających, że im większa świadomość dotycząca jakości środowiska, tym większa skłonność do jego poprawy, przeprowadzonych pomiędzy przedsiębiorcami pracującymi w przemyśle oraz mieszkańcami. Badaniem stanu zarządzania środowiskiem opartym na różnego rodzaju kwestionariuszach objęto 200 zakładów przemysłowych w stanie Ondo (Nigeria) oraz 172 mieszkańców żyjących w promieniu 100 metrów od wybranych do próby zakładów. Zgromadzone dane zostały przeanalizowane przy wykorzystaniu wykresów i tabel. Wartość średniej ważonej (ang.: mean weighted value (MWV)) dla każdej kategorii odpowiedzi porównano z wartością średniej ważonej dla grupy (ang.: group mean weighted value (GMWV)), aby wyizolować najistotniejsze odpowiedzi. Wyniki ukazały, że większość właścicieli zakładów, z niskim wykształceniem, pozbywa się odpadów w nieodpowiedni sposób, poprzez spalanie (57%), zakopywanie (23%), porzucanie na niezagospodarowanych terenach zielonych (12%) i w systemach kanalizacyjnych (11%). Spośród wszystkich 200 przedsiębiorstw zdecydowana większość (191 – 87,2%) była przekonana, że jest poszkodowana wskutek działalności sąsiednich zakładów. Co więcej, mieszkańcy i przedsiębiorcy różnili się w swoich opiniach co do oceny technik zarządzania środowiskowego przyjętego do gospodarowania odpadami. W opracowaniu stwierdzono, że niski poziom opinii przedsiębiorców, inercja rządowych agencji nadzorczych, niedbałe postawy ludzi oraz słaby poziom edukacji wśród właścicieli to najważniejsze przyczyny nieodpowiedniego gospodarowania odpadami. We wnioskach stwierdzono, iż właściwe postrzeganie problemu dzięki poprawie edukacji ekologicznej są kluczowe dla zrównoważonych rozwiązań w gospodarowaniu odpadami w zakładach przemysłowych.

Afolabi Francis FATUSIN

Słowa kluczowe: zarządzanie środowiskiem, odpady, zakłady przemysłowe, przedsiębiorcy, postrzeganie, jakość środowiska