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EXTERNALITIES FROM AIR POLLUTION AND ITS HEALTH CONSEQUENCES: DOES ENVIRONMENTAL TAX MATTER?

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Abstract

Environmental issues have emerged in recent decades as major aspect of the discourse on the problem of economic growth and sustainable development. Environmental issues associated with industrial activities in the 21stcentury have heightened public concerns about continuous degradation of the ecosystem as a result of industrial pollution and its effects. These environmental concerns are now in the forefront of debates on economic growth. This study aims to examine externalities from air pollution and its health consequences in Nigeria. Data were sourced using questionnaire and analyzed using the cost of illness method (COI) with the help of Microsoft excel version 7.0. Further, descriptive statistics' by means of nonparametric Kruskal Wallis test was also used. The findings reveal that externalities from air pollution have detrimental health effect on the populace. The study recommends that government should formulate plans to design a tax process that might encompass environmental tax policies, so

that the levy of tax be designed placing its burden on those who are responsible for causing a particular environmental externalities, and also make provision for statutory incentives to minimize administrative cost to the government and compliance cost imposed on the taxpayers.

Keywords: Degradation, Environment, Externalities, Pollution, Taxation

INTRODUCTION

The ultimate goal of every country is to achieve a reasonable level of sustainable economic growth and development. In the 21st century, the concept of environmental sustainability has assumed a special attention in sustainable development issues in both developed and developing economies. Environmental pollution has many negative consequences including health damages. It reduces productivity of labour and capital and affects the overall performance of a country.

Environmental problems caused by industrial activities in recent years increase the pressure on government to device ways to ease the damages particularly on health. The major tools that can be used to minimize environmental damages include innovation policies, taxes, regulations, legislations, environmental subsidies among others but, taxes are found to be most efficacious in reducing environmental damages in both developed and developing countries (OECD, 2001).

Externalities related to cement pollution can be environmental or socio-economic. Recently many adverse incidences have been noticed and almost reported on cases of Asthma Diseases. The disease has been on the increase in and around the cement industry, which leads to serious concern by the host community (Gebaran, 2011). In general air pollution can have externalities such as health damage to surrounding communities, additional expenditure on the impact of mitigation, an excess hour spent on treatment of sickness, and reduction of the land value of surrounding land. In principle, we can argue for government regulatory intervention in the case of pollution externalities, based on efficiency alone: resources are not efficiently allocated because much of the goods are produced when externalities remain unresolved (Chayut & Nuttapat, 2017). While the manifestation of environmental abuse has differed depending on the condition of each country, there are generally two kinds of environmental issues (i) those that arise primarily because of poverty and population growth and (ii) those that arise from the increase in industrialization and urbanization leading to pollution of water, air, and land.

These externalities can be categorized in various ways such as direct or indirect, market or non-market costs depending on the criteria used for categorization. However, only a small amount of cost is considered in decision making. For example medical treatment cost of an Asthma attack caused by the dust from the cement quarry may only represent the market cost of the damage. However, other costs such as opportunity cost of time of the caretaker, the cost related to travelling and their willingness to avoid suffering are the non-market costs that need to be accounted for by the damage as well. Thus the externalities need to be estimated and internalized in sensible way (Helen, 2016). The paper analyses the damage cost due to Asthma diseases as a result of cement pollution from Ashaka cement industry and suburb area in Gombe State of Nigeria.

The remaining part of this paper are organized in five sections as follows: section 2 provides theoretical consideration and related review of literature. Respectively, methodology and results and discussions are treated in section 3 and 4 followed by conclusion and policy recommendations in the last section.

LITERATURE REVIEW

Theoretical Underpinning

Many activities done by industries cause so many damages to the environment. For example, the discharge of effluents are rarely taxed, cement pollution, whereas others such as fuel and fossil are either undertaxed or subsidized. There is actually fairness in the argument that: unless we have positive externalities that require market based instruments, a society should absorb part of firm's costs. While economists generally accept the theory of externalities, and all agree that the externalities are very large or important indeed, if external costs are small and insignificant, then little is lost by simply ignoring them a minor side effect by the markets (Anwar, 2015). Corrective taxes on activities or substances with negative externalities (effluents, pollution, noise, congestion and so on) can expand the tax base and at the same time restrict such activities. If the tax succeeds in inducing environmental friendly practices among producers and consumers, it would not generate much revenue but would be efficient in protecting the environment. If however producers and consumers continue to follow environmentally damaging practices, the tax would generate revenue that can be used either to lower other distortionary taxes or to fund cleanup programs or abatement technologies (AfDB, 2014). However, several studies, including the one by Syeds, 2006 and Ditya, 2016 theoretically argue that an environmental tax may have a multitude of possible effects which are sensitive to underline institutional framework.

This approach is likely to make polluting more costly and investing in alternative technologies, practices, and resources more attractive. Nevertheless, keeping in mind the economic effects, the distributional and competitive impacts coupled with the mitigating actions, the tax need to be carefully designed if it is to effectively support environmental policies. Pigou (2002) was concerned with welfare maximization and build up a theory of economy effectiveness suggesting national dividend, and consequently welfare, will be increased to an optimal level if external environmental cost were fully internalized.

The rationale behind this theory was that there is a proper allocation of costs between those who engage in economic activities causing pollution. It also suggests that both polluters and pollutes, would allow equal social benefits and social costs associated with those activities. This is because social welfare is based on the welfare of individuals, it normally implies Pareto efficiency (i) such individual is the best judge of his own welfare; (ii). The welfare of society depends on the individual welfare of its citizens and (iii). If the welfare of one individual increases and the welfare of no one individual decreases the welfare of society increases (Maler, 2006). At this juncture, for the welfare of individual to be attainable in a developing country like Nigeria, polluter needs to be treated with carrot and stick approach through the use of environmental taxes.

This condition would be fulfilled if the costs of marginal uncompensated externalities were imposed through a tax on the agents causing them instead of burdening the society. A logic symmetric to the one developed for the external costs case should be applied when external benefits occur. In such acase, the tax should be replaced by subsidy to the economic agents.

Since the Pigouvian aims at neutralizing the difference between the marginal social net product and the marginal private net product (Pigou, 2002); the tax rate should be at the amount of the marginal external costs per unit of pollution (Cropper & Oates, 1992; Boverberg & Gulder, 1996; Fullerton &Metcalf, 2010; EEA, 2000).

The Pigouvian theories focus on the internalization of external costs. Therefore, according to such theories, the pollution tax rate should be calculated according to external costs rather than to refer to the precise amount of pollution abatement (Pigou, 2002). These theories aim at welfare maximization rather than any specific environmental goal, with environmental improvement being a consequence of such general efficiency gains attained via full costs internalization.

The expected improvement in resource allocation shall occur as results of behavioural changes induced in the economic agents by the reallocation of external costs. Costs of internalization are a first means which start another means behavioral changes. In order to

accomplish a specific objective, that is, welfare maximization (Brice, 2005), environmental results are secondary to the economic goal of increasing economic welfare by correcting market prices via costs allocation (Milne, 2003; Shadow, Price, Kneese, Ange, 1970).

Effects of the Pigouvian tax are dual: an abatement effect and output effect. The first arises because of incentives to reduce emissions as long as marginal abatement costs are lower than the unit tax rate. This output effect is a result of increased production costs due to abatement costs for reduced emissions and tax costs for remaining emissions.

Thus, following the adoption of a Pigouvian tax on emissions, two kinds of effects on resource allocation are expected: a direct improvement on the environment through reduced emissions and indirect improvement through a structural shift in production towards less environmentally damaging goods.

The tax is the endogenous variable in a Pigouvian model. Regulatory intervention is explained by the absence of pollution control in the pre-tax movement and its occurrences in the post-tax movement. Polluters develop their decision-making process taking the amount of tax levied as a reference. A behavioural response is expected in a context where it is cheaper. (Poster, 1992), economic agents to control polluting emissions than to pay for the full costs associated with such emissions (that is, private costs plus external costs internalized by the Pigouvian tax). “Therefore, government should endeavour to promote the internalization of environmental costs and the use of economic instruments, taking into account the approach that the polluter should, in principle, bear the cost of pollution with due regard to public interest.

However, in order to capture externalities to prices, we have to look into environmental damages that lead to costs that have to be covered by society. For example, costs of health care and the repair of buildings due to pollution. This has to be paid from the public and private budgets. If these costs are not covered by the (polluters pays principles), they are externalized; the bill has to be paid by someone other than the polluter. For example pollution from cement industries, power station, contribute to the acid rain that damage soil, vegetation, water and building belonging to people, and countries that do not directly benefits from the power station. And because the price paid by the power previous and consumer do not include those “external costs” they give incorrect market signals encouraging power production beyond the level of optimal economic efficiency for the country as a whole (EEA, 2013).

When externality is not sufficiently included in the prices they create distortions in the market by encouraging activities that are costly to the society as a whole; even if the private benefits such as car driving are substantially estimating the economic value of externalities of economic sectors is not easy and is restricted to that part of the total that is quantifiable. It is usually an indicator of the lower boundary of the cost that is not controversial. Only for transport

and energy estimate available still facing several uncertainties (EEA, 2013). The “ideal” environmental tax includes that external cost in price (the internalization of externalities) so that both social and private costs are brought closer together. The more the prices allow the market (example transport services. electricity). To work with full costing, the more efficiently they help to internalize those costs.

This internalization of externalities costs will lead to a reallocation of resources in the economy according to fair and efficient prices, by redistributing the costs. Thus by so doing environmental taxes help in improving societal welfare. Although the Pigouvian approach was mentioned in some reference reports (see EEA, 2000) but not often followed in institutional practices. For instance, in the 1990s, the Swedish ministry of finance claimed environmental taxes should theoretically be constructed as suggested by Pigou (Budget Bill, 1991) but this calculation method was scarcely used in Swedish practice (SEPA, 1996). And also, the UK landfill tax is viewed as an example of Pigouvian tax (EEA, 1996,Maata, 1997) as its rate were initially supported by externality evaluation using costs benefit analysis (Powel & Craghill, 1997; OECD, 2001).

The theory is preferred because it provides a framework to uncover the prospects and challenges of environmental taxation in Nigeria. Therefore, by focusing on the theory of internalization Environmental tax can be an important tool for facing current and future environmental challenges related to, water scarcity, energy security and general resource limits (i.e. living within the planet’s regeneration capacity). Even a modest tax shift can help to provide positive signs to the economy by putting the right price on resources, making polluters pay, and alleviating pressure on more ‘benign’ goods like labour(Bassi &Brink, 2010).

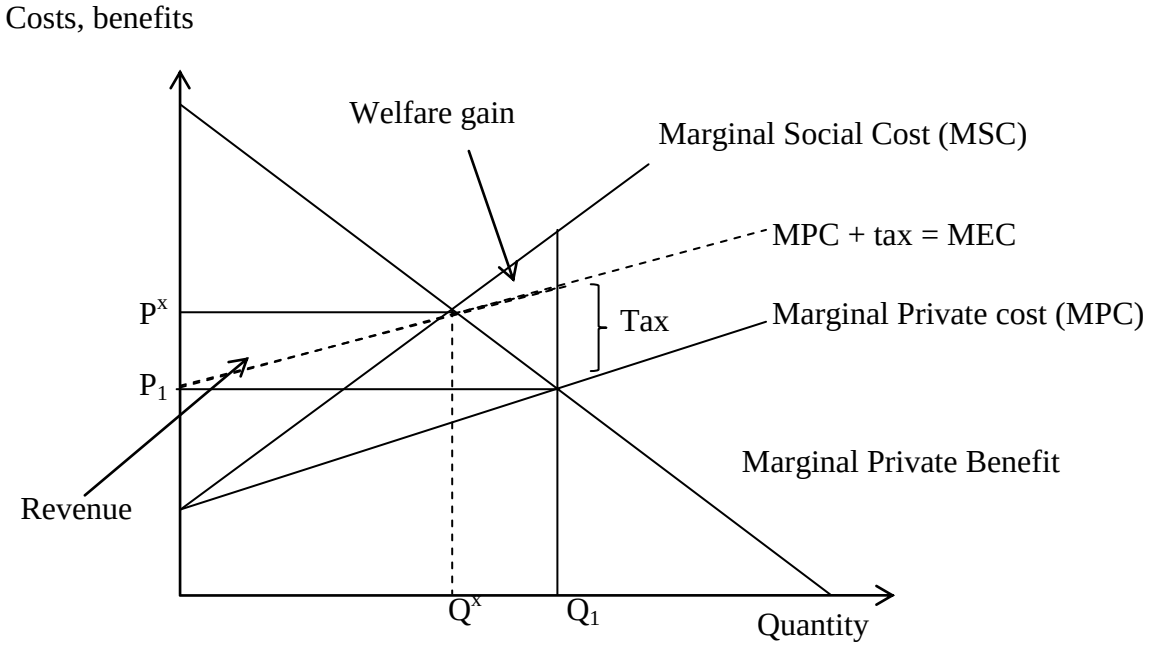
Furthermore, David, Steffen, & Ibon (2013) assert that in an economy with pre-existing taxes Pigouvian taxes are usually more efficient than subsidies as the revenue can be used to reduce other taxes. As shown in Figure 1, individuals and firms who are causing pollution only consider their private marginal costs (MPC) and do not necessarily take into account the environmental damage (or externality) caused by their actions. This results in a higher level of consumption (and hence pollution or environmental damage) than what the socially optimal level should be (that is, Q1). According to Pigou, this problem could be addressed by imposing a tax that is proportional to the environmental damage caused. The tax plus the MPC equals the marginal external cost (MEC), which eliminates the externality and results in a lower and hence socially optimal level of consumption (and pollution). Therefore, an externality is defined as societal costs that is not reflected in a market transaction.

An environmental tax is consistent with the *Polluter-Pays-Principle, PPP* (OECD, 1989). It affects the relative prices of environmental-related products and activities, thereby forcing

firms and individuals to pay for the negative externalities generated by their consumption or production activities.

Ideally, an environmental tax should be levied directly at the externality and equal the MEC of the emissions or production activity. This is referred to as a 'first best' tax. In practice, however, the implementation of an environmental tax tends to deviate from the theoretical optimum for a number of reasons. One of them is that the demand curve for pollution control and the marginal external cost curve are difficult to estimate, due to the fact that market prices do not exist for most environmental goods, such as clean air. Other considerations preventing the implementation of the theoretical optimum include market failures, conflicting political stands, pressure groups, and considerations other than pure economic efficiency concern.

Figure 1. Externality correcting environmental taxes



Source: Adapted from John (2014).

The main aim of an environmental tax is to increase the firm's private marginal cost (MPC) until it equates with marginal social cost curve (MSC). This would result in a socially efficient level of output. In the diagram above this would mean setting a tax equal to the vertical distance q^x and q1, which is equal to the level of environmental damage caused at the optimum level of output. However, according to Ciulevicience (2014), has a contrary view to other researchers he

asserts that environmental taxes may have also had its own negative effects as well. These taxes may reduce competitive ability of national industries. Negative effect of taxes occurs when polluting industrial companies move to the countries that exercise less strict on environmental requirements rather than implementing innovations to reduce the pollution.

Empirical Review

There are plethora of studies that investigate the health consequences of externalities from air pollution across the globe. For instance, Tichavska and Tovar (2017) find that accurate calculation of external costs from vessel emissions and shipping strongly depend on factors such as location, the time of the day and vessel operative. In another study of the role of environmental taxes on flood reduction in Nigeria, Uwalomwa, Ranti and Francis (2015), find that there is a significant positive relationship between imposition of tax on leather industries and reduction of flood. Farzin (1996) finds a threshold interlink between optimal pricing of environmental tax and stock of externalities. Likewise, Naryak and Chowdhury (2018) in their analysis of health damages from air pollution in Odisha district of India show that there is a positive and significant nexus between level of air pollution and occurrence of diseases in the region.

Misra (2012) examines the damages to human health caused by air pollution and the result reveals that a strong positive correlation exists between air pollution and tendencies of prevalence of air bone diseases. Correspondingly, Tichavska and Tovar (2015) find that the estimated external costs associated with the damages that vessel emissions contribute upon human health and the built environment surrounding port of Las Palmas are significant. Again, Wang and Wei (2017) investigate the effect of externality in China and the results show that among others it has significant negative effect on agricultural output and health of the surrounding communities.

Sipes and Mendelsohn (2001) investigate the effectiveness of gasoline taxation in curbing air pollution using data from U.S. and the empirical result reveals that income elasticity is low (0.1 – 0.2) such that the gas tax will fall heavily on the poor people. Thus, this shows that imposing environmental tax will result in only a small improvement in environment as an ability, in another study for the legislation and control of air pollution in China by Feng and Ligo (2016) and the result reveal that air pollution problems in China are directly related to inefficient and imperfect legislation resulting from poor planning and inconsistence in laws and environmental policies. Similarly, Zou, Azam, Islam and Zaman (2016) examine the impact of air pollution on health using dataset for low-countries and the result indicates that air pollution is a measure for low-income countries. The study of Shanmugan and Hertelendy (2011) reveals that the

developed countries contaminate the air by their too much usage of fossil fuel and cord energies in the industrial sector, albeit, they have sound environmental laws and policies compared to development economies.

Again, Pope (2007) reveals that the air we inhale comprises of emissions from several different sources including heating and commercial sources, household, fuel industry, motor vehicles and smoking of tobacco. Samet and Krewski (2007) show that air pollution directly affects respiratory system.

Furthermore, Hana and Oliva (2015) examine the impact of pollution on labour supply in Mexico and the finding shows that pollution has significant negative effect on hours of work in industries. Similar result was found by Zirin and Neidall (2012) that there is a negative association between air pollution and productivity for farm workers in U.S. In another study by Fecher and Matibe (2003) they examine the environmental implications of increasing use of electricity in South Africa and found an adverse negative effect between them. Williams (2003) investigates health effects and optimal environmental taxes using an analytically tractable general equilibrium model. The result shows that interactions with health effects from pollution actually would tend to reduce the optimal environmental tax, which implies that tax-interactions tend to raise the costs of an environmental tax.

METHODOLOGY

The research model presented in the findings of this study; the data was analyzed using Cost of Illness method (COI). To ascertain the health damage cost of diseases perceived by the surrounding communities. The total costs of illness for households in this research were computed for Asthma diseases and the total cost is extrapolated to the population to get total annual cost of illness. Going by the existing literature on health economics the cost of health (COI) is the sum of medical treatment (the direct cost of illness), the value of the productive time lost due to illness (the indirect cost due to illness) and their willingness to avoid sickness.

Cost of illness (COI) = D +K

Where; D is per person per year direct cost of illness, K is per person per year indirect cost of illness. The costs were estimated in terms of Asthma diseases experience by the household in the affected areas which was selected for the survey

The data for the study were collected through primary and secondary sources. The primary source was achieved by administering questionnaire to households at each distance level from the polluting area in addition to that, interview is also granted with all the stakeholders in the area.

RESULTS AND DISCUSSIONS

General Features of the Study Area

The study area comprises of village surrounding the cement factory in Ashaka which includes Wuro Arci, Tongo, Gwangila, Mai anguwa, Jaura saje, Garin Abba. These villages are lying less than 20 km from the cement factory which is located in Funakaye local government area of Gombe state, north eastern Nigeria. Ashaka cement factory is located on latitude 10^0. 8847' and longitude $11^0$5148'. The climate of the area is humid tropical characterized by wet (April – November) and dry season (December to March). The crops grown around the cement areas is mostly Millet, Corns, Maize and to some extent cassava which were produced by the community year in year out long before the establishment of the factory.

The communities under the study are predominantly peasant farmers and are mostly male gender accounting for about 78.5 percent of the population, most of them are married (above 89 % in both areas), and the households size is quite large in both cases ranging from 3-15 persons. The literacy level of the people living in the vicinity of cement area is about 42.7 percent. This may also create a lower awareness of the danger of cement dust air pollution in the targeted area.

There are 371 sickness episodes that were recorded in the sample of 600 households which is selected randomly. 295 cases successfully answered the questionnaires administered to them and 76 questionnaires are not return. Out of these, 120 cases are recorded within first 0-2 km, distance to the industry, quarry 67 cases have been recorded within 2-4 km, wheezing and sneezing are also some of the cases identified from 47 respondents, more cases have been recorded between 4-6 km whereas 38 cases were recorded with 6-8 km and 23 cases were recorded within 8-10 km away from the pollution site

Health Impact Perceived by the Community

A detailed analysis is conducted for one of the major diseases caused by cement pollution that is Asthma by using costs of illness method. The estimation was carried out within 10 km distance from the cement industry. It is widely believed that estimating the cost of an illness is a useful aid to policy decision making to legislatures, administrators, executive arms of government and industries.

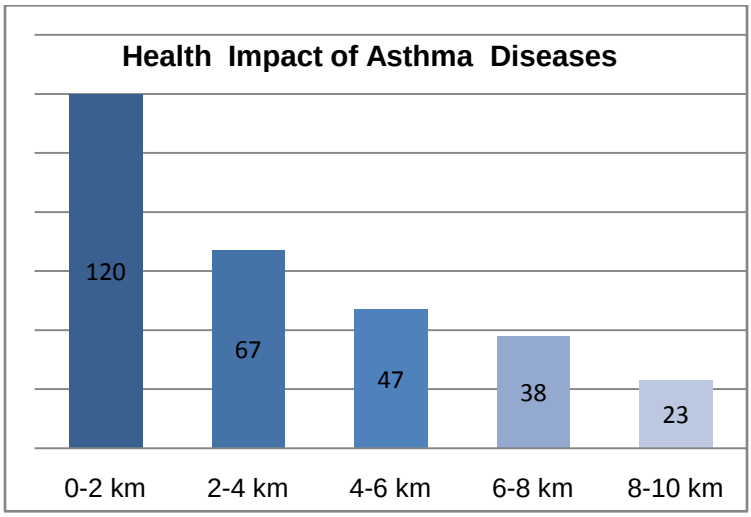
However, measuring the damage cost must take into account this relationship between the action (for example pollution) and the impact of diminished human health and between the impact and economic costs. (For example health's care expenditures. The value of foregone production and the value of assigned to diminished quality of life.

Health Impact of Asthma

Figure 2 shows the normalized value of Asthma cases record for each distance level. The figure shows a decreasing trend of sickness episodes with distance from the cement industry. This implies that there is a strong relationship between illness and the distance. This is as a result of an interview conducted with the people in the affected area, which revealed that Asthma is the predominant disease affecting all the people in the area because of dust coming up from the quarry. Furthermore, it has also shown that exposure for a long period of time to a very high concentration of cement caused asthma**.** This further supported by the fact that people are highly disturbed by the rate of dust situation in the area. Another thing that the researcher notice in those villages is the amount of dust, the closer to the plant, the worse it is. Thus, it is reasonable to argue that these allergies are caused by the presence of the quarry, as a result of the cement industry.

There are 295 sickness episodes recorded in the sample of 600 households. Out of these, 120 cases were recorded within first 0-2 km, distance to the industry quarry, 67 cases have been recorded within 2-4 km, wheezing and sneezing is also complained by 47 respondents more cases have been recorded between 4-6 km whereas 38 cases were recorded with 6-8 km and 23 cases are recorded within 8-10 km away from the pollution site. Based on the results obtained, it is clear that the closer the pollution site the higher the rate of asthma attack. It has been observed that leaving closer to pollution area has a great impact on the health wellbeing and condition of the residents who are mostly peasant farmers. Furthermore, the frequency of sickness episodes is shown in Figure 2 and the method of treatment is equally shown in Figure 3.

Figure 2. Health impact of Asthma Diseases



Mode of treatment of Asthma

The analysis has shown that majority of the people in the communities got their treatment from cottage government hospital while very few got treatment from private clinics and medicine stores. Many people prepared to go to private clinic for quick and fast prescription, unlike government hospitals. This is because most of the government hospitals lack sufficient medical doctors who wouldnot volunteer to stay in a remote area. Figure4.2 shows the percentage of those who go to private and government hospitals. The data showed that 55 percent of the respondents are of the view that they prefer government hospital because it is affordable whereas 40 percent of the respondents go to the private hospital for treatment and only five percent attends both private and government hospitals. Furthermore, a study conducted by Helen, (2016) has shown a direct relationship between the number of hospitalizations for asthma and increase in particulate matters in local air. For example, the centerfor diseases control and Prevention (CDC) has affirmed that there is a strong link between asthma and air pollution, and the environment where mining activities are taking place.

Figure 3. Mode of Asthma Treatment

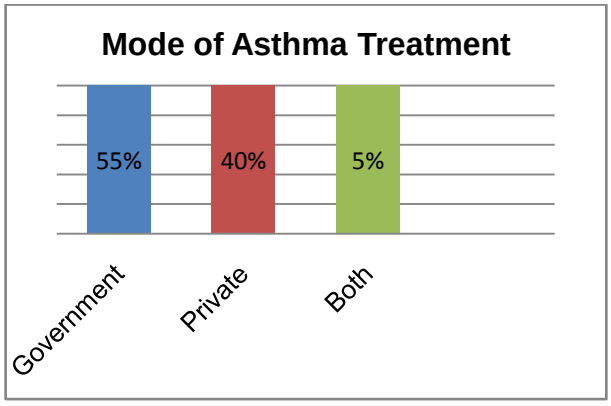


Figure 4. Mode of Transportation for Asthma

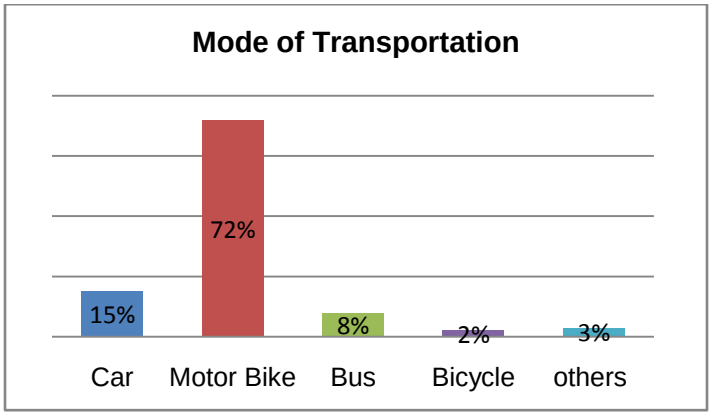


Figure 4 shows different modes of transportation used by the people of the community. The people in the communities used mode of transportation that is predominantly motor bike which accounted to 75 percent as their main mode of transportation and followed by private cars accounting for 15 percent. Bus is found to be 8 percent, bicycles 2 percent and others which includes cow, camel, donkey and some go on foot. This data has extensively shown the low socio-economic status of the people in the community.

Further, the minimum number of visit to the hospital in the case of asthma is one, whereas the maximum number of the visit is four and the average visit per episodes is 1.28 per year. However, on the average, a person spent 1.45 Minutes per visit where it lies within the minimum of one hour and a maximum of three hours.

On the average, a patient does stay at home due to asthma attack for the period of 2 days and 1 day at the hospital due to the sickness. The maximum number of days stayed both at home and at the hospital is 10 days. Whereas the analysis of doctors' fees and test fees has shown that the total amount of N1,282,582 for asthma episodes.

Analysis on the indirect cost of illness which includes (the 'lost contribution' to the economy and to society following from either premature mortality or from illness or disability and the cost of caretaker who did not perform their day to day activities),the cumulative is taken for both work days lost due to illness by the patient and work days forgone by the caretaker while attending the ill person. The indirect cost due to children is not considered in the calculation, this is due to unavailability of data from the side of children for quantification.

Rice (1994) observed that majority of the cost of illness studies assumed that daily productivity is equal to the market wage rate, or fraction of it. However, this is obtainable in a developed country. In a developing country like Nigeria, the absence of properly defined labor markets in the country, whereas the wage rate depends on the profession. The monthly income of an individual is normally used as the basis for calculating the daily wage rate. However, the average value was taken as the wage rate for those who get daily wages. This value then is used to calculate the per hour rate separately for male and female daily workers.

Furthermore, the cost of transport used by individual household differed with distance to the hospital and with the mode of transport. However, individual cost calculation was arrived at using a different mode of transportation.

Table 1. Cost of Illness from Asthma

Direct costs per year (N); Indirect costs per year (N)

	Cost of treatment	Transport Cost	Bed Cost	The lost of productivity time by patient	The lost of productivity time by caretaker	**Costs of illness per year (N)**
Total	**1,282, 582**	**68,745**	**53,700**	**1,087,511**	**24,585.99**	**2,506,374**
Average per case	**10,688.18**	**572.88**	**447.50**	**9062. 59**	**204.88**	**20886.45**

Total estimated cost of 295 Asthma cases per year is estimated to be **N**2,506,374 and the average cost is around N20,886.45.

Table 2. Kruskal-Wallis Test on Diseases and Distance to the Pollution Area

Distance in Kilometer	**N**	**Mean Rank**
0-2 km	40	236.09
2-4 km	71	186.99
4-6km	50	183.00
6-8km	61	182.52
8-10km	151	177.14
Total	**373**	

Generated by the Researcher using SPSS 20.0 from Questionnaire Response, 2016.

Kruskal-Wallis Statistics KW = 3.338; P-value is 0.045

Table 2 shows that distance 0-2 km has the highest Mean rank of 236.09, indicating a common diseases affecting the surrounding communities, while 8-10 km has the lowest Mean rank of 177.14 On the whole, with Kruskal-Wallis test result of 3.338 and P-value of 0.045, the result suggests that, there is quite significant statistical difference between the responses of the respondents as regard the distance and the diseases.

Table 3. Test Statistic[b]

	Total Cost
Chi- Square	9.729
Df	4
Asymp.Sig.	0.45

a. Kruskal Wallis Test

b. Grouping Variable Distance in Kilometer

CONCLUSION AND RECOMMENDATIONS

The study reveals interesting facts on the effect of air pollution on environmental health. Externalities from air pollution in the study area has caused so many cases of diseases especially asthma making life difficult for the people living in the area. The study shows that living closer to pollution area has a great impact on the health wellbeing and condition of the residents who are mostly peasant farmers. Environmental tax is believe to be a strong tool that can be applied by government to reduce the level of pollution by cement industry in the area.

Besides that, environmental taxes have many important advantages, such as environmental effectiveness, economic efficiency, the ability to raise public revenue, and transparency. Also, environmental taxes have been successfully used to address a wide range of issues including waste disposal, water pollution and air emissions. Taxes are among the most important economic instruments available to deal efficiently with pollution and thereby help protect the environment. Environmental taxes have the potential to address both of those issues, providing a source of new tax revenue and a cost-effective way to reduce pollution emissions. This paper examines potential environmental tax policy reforms. It focuses primarily on a carbon tax, which is the largest and most important potential new. The government can use the revenues that arise to reduce the distortionary effects of other taxes.

There is, therefore, an urgent need for government interventions through market based instrument approach environmental tax, in particular, to ensure that all the environmental legislations especially the one that relates to cement dust pollution and air pollution are seriously enforced. The imposition of environmental tax, the cement industries must be made to know that the damage cost emanating from negative externalities as shown in the data analysis supposed to be internalized within their operational cost. This implies that the average environmental damage of N2,506,374 Million. Which out to be input in their operational cost and ceded to the government to ameliorate damages arising in the target cement production areas before consideration of their CSR to the host communities. This, if done would go a long way in the restoration of the cost of illness incurred as a result of ill health caused from cement dust pollution. It is only when these are implemented, we can be said to be going a long way in striking a reasonable balance between benefits derived from a cement production and amelioration of damage cost in the form of negative externalities inflicted on the producing host communities embarked on by cement industries.

Based on the findings of this study, the following recommendations have been outlined which may be useful to the decision making bodies such as legislatures, companies management, communities members, a lobbying group, and the regulatory bodies responsible for setting laws.

In order to reduce business and citizen's opposition to environmental taxes, Federal Government of Nigeria should embark on massive public awareness programs in order to educate the general public about environmental taxation, enlightening them that the tax should be designed in such a way that will place the burden of tax on those responsible for causing a particular environmental problem. This will help to show the clear relationship between what is taxed and what is pollution. By doing this the environmental tax stands a better chance of being perceived as fair by stakeholders.

The study calls for more concerted efforts to be taken on the part of the government to encourage management of these companies on the need to embrace environmentally friendly practices in order to restore and guarantee a conflict-free corporate atmosphere, needed by managers, workers, and the host communities for maximum productivity. Moreover, funds expended in setting disputes could be applied to enhance corporate liquidity while management is able to plan better and make a decision when it is not engaged in disputes.

Further research in this area should move the debate further by assessing not only the effect of externalities on health issues but also the economic and social implication of other related externalities like the effect of land and water pollution on agricultural activities.

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