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Pay as you throw; An Exploratory Discourse on Market-Based Approach to the Environmental Problems Caused by Public Littering in Nigeria

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Abstract

This paper provides an overview of environmental policy research focusing on market-based instruments, and their applicability to developing countries, especially Nigeria. It also addresses more general developments in the field of Deposit Refund Systems and explores the practicality of a deposit-refund system (DRS) to litter management in Nigeria. A prominent theme of our discussion is economic instruments, wherein approaches will be explored, to understand the link between compliance, and neglect inherent in environmental issues of a developing country like Nigeria.

Where the objective is to reduce littering, deposit-refund system was considered the choice for the framework of this study after researches detailed its benefits, and relevance to the research problem. Deposit Refund System (DRS) is subsequently discussed as a policy intervention, and the feasibility of introducing the system in Nigeria is evaluated. By understanding the implementation mechanisms, the economic viability, and environmental effectiveness of a deposit refund system, it is concluded that a DRS can support a country's drive to solve some of its pressing issues of environmental concern even with the bare minimum of government administration. The consolidation of information from this research can kick-start the conversation on ways to incorporate this system as part of Nigeria's solid waste management policy.

Keywords: Environmental Management; Command-and-Control; Market Instrument; Deposit Refund System; Litter Management

Introduction

Environmental problems have become the bane of many developing countries due to increased urbanization and industrial activities. As countries develop from low-income to middle and high-income levels, their waste management situations also evolve (World Bank). The intersection between economic development, and improved standard of living has consequences beyond the purchase of goods and services, as Luxton posits that the development of an economy brings about some form of damage and disruption to both the physical and social environment, with its implications imperilling the quality of life of people around the world, particularly in developing countries. It is notable to mention that there is a disagreement to the framing of urbanization as having a net negative effect relative to the links between production and consumption. Some researchers like McGranahan have considerably argued in favour of contextualising urbanization by applying scales at different levels to avoid misleading accounts of the qualities of urban settlements that generate the environmental burdens. Accordingly, McGranahan, Satterthwaite, & Tacoli believes that economic development and urbanization can be net positive through greater technical efficiency which could reduce the waste per unit of output. While there are few oppositions to urbanization being largely contributory to environmental degradation, the consensus establishes that there are immense challenges posed by increased urbanizations without holistic frameworks to cushion against its adverse impact.

Methodology

The research method will primarily be driven by evaluating how developing countries can deal with environmental problems through command-and-control approaches, and how it compares to other environmental policy instruments such as a market-based instrument. Subsequently, literature reviews are used to analyse the key components of deposit refund systems in general and identify the typical material and financial flows in different contexts. Relevant literature reviews are essential to access the impact, both in terms of economy and environment. Using DRS as one of the environmental policy instruments, one can determine its suitability to supplement existing legislation on waste litters or lack thereof.

Environmental management and Economic Goals in Transition Economies

In developing countries with unacceptably low living standards, environmental concerns may be just as much of an economic issue as systemic inadequacies; it is a major threat to environmental protection. Several research works of literature have pointed out the link between poverty, and the lack of environmental concern. Salau maintains that poverty can be recognised as one of the worst culprits affecting ecological degradation. Hence, developmental agencies and environmental

policy researchers have constantly sought to find synergies between the environment and development, to address the issues of poverty, consumption, patterns, demographic pressures, land, freshwater, and forest (World Bank). World Bank further contends that for environmental policy to be more practical – one that recognises the constraints that governments and societies face – and effective, it is imperative more emphasis is placed on reconciling the environment and development. Approaches that should improve environmental performance will benefit from marrying economic policy and development strategy to advance sustainable development while dealing with environmental concerns in discussing the links between rural poverty and the environment in developing countries – focusing on the context of categories of assets and categories of environment change – argues that although poverty is associated with environmental problems, the over-reliance on treating poverty as a single concept detracts from the conditioning variables that affect market development, community wealth, infrastructure, and appropriateness of natural resource conservation technologies.

Threats the environment faces in this region of the world can be summed up to be more economic than informative, in addition, to complete neglect on the harm which they pose on their quality of life due to the actions or inactions of the public. Meanwhile, Ojedokun and Oluyinka & Balogun attributed the failures of various institution's approaches in dealing with littering problems to be less of a regulatory problem, and more of an attitudinal, behavioural, or social problem that requires a psychological solution. This fact is bolstered by Viscusi, Huber, & Bell argument that individual behaviours that benefit the environment are potentially influenced by values of environmental quality, social norms that encourage pro-environmental actions. Reflecting on these assertions, one can opine that people's attitude toward environmental concerns may be waning where there is less of an incentive to be environmentally sensitive; a weak and relatively underdeveloped compliance system only exacerbates the problem. The consequences are dire, but for a country like Nigeria that is characterised by inchoate bureaucracy, weakened governments and, legal systems, compliance will continue to be a major issue. The same goes for the enforcement of laws which is a common challenge in low income countries (World Bank).

There are no clear formulated policies in Nigeria aimed at coordinating and monitoring the relationship between environmental management, and sustainable development. This is despite all the efforts by the federal environmental protection agency. Accordingly, for several decades, there have been agreements with international bodies by the federal government, signalling their pledge to accelerate the implementation of environmental policy blueprints that foster a variety of approaches to integrating environmental management programs and economic growth. Furthermore, there have been concerted campaigns by the federal government to design policies that can educate the local populace on the need for environmental consciousness, but few have recorded significant success of any measure. The same pattern has occurred in both military and civilian regimes in Nigeria. Despite modest progress in oil spillage control in the Niger Delta region Kadafa, many obstacles and challenges to inducing environmental sensibilities amongst the populace persists. However, the public consensus on profound economic development has cast doubts on the success of any environmental measure. This issue is further aggravated by the lack of political capital of successive governments in dealing with this issue thus the incentive to move aggressively on the issue may be blunted by the political calculus of gainers and losers.

The prevalence of environmental degradation is exacerbated by the non-existence of enforceable instruments to curtail the wanton reckless disposal of solid waste. Moreover, regulations governing the environment are only as effective as the scale of responsibility authorities confer on the public. Their prioritization of other areas of governance indicate that various administrations in Nigeria place very little importance on environmental issues, for good reasons, because governments have limited resources, therefore waste management often become a lower priority sector (World Bank, 2018). While strong growth remains a necessity for developed countries facing recession or economic loss, protecting the environment is improbable to be a high priority until it is seen as a relatively efficacious way of avoiding stagnation and reaching macroeconomic stability.

Beyond a Command-and-Control Approach

Early researches concentrated on control and command regulations as one of the ways to reshape incentives. As the word infers, a command-and-control approach refers to a prescriptive regulatory scheme focused on statute and police authority, to induce enforcement by the use of penalties if necessary. It engenders fear in people, inducing them to change their behaviour. Command-and-control approaches were domain in environmental policies until about 15 years ago. While it dominated the field of environmental policy, alternatives are being sought as both the real and relative success of traditional policies diminishes in the face of growing environmental concern. It struggled in the face of scarce enforcement resources and proved to be more costly and complex (World Bank).

Many considerations influence the decision to favour either policy that leans more towards economic incentives (EI) or direct regulation, also known as command-and-control (CAC) administration. The essence of the environmental issue itself, as well as the country's political and regulatory infrastructure, are underlying determinants. Policymakers face a complex decision when deciding on a strategy they can apply to environmental administration. When it comes to the command-and-control approach, one of the important considerations for them is the degree to which its regulatory ability favours efficiency and administrative feasibility, without the recourse to financial resources that could impact the macroeconomic performance of the country.

Meanwhile, environmental management in Nigeria is characterised by a command-and-control approach. This strategy has many drawbacks, including a severe lack of government finances, management experience, and institutional compliance capabilities. Efforts to use command-and-control

approaches in a transition economy like Nigeria would not only be met a with multi-faceted problems in its implementation. Furthermore, as the authorities strive to inculcate environmental discipline in the populace when socio-economic goals are the most pressing needs, any other action done for the 'common good' of the society will be placed on the backburner. When the populace is cognizant of the country's weak environmental institutions, and scare enforcement resources, they will have less reason to comply with environmental policies; fail to contribute to the collective protection of the environment, and proactively respond to pressing environmental issues.

Environmental issues are driven by human interests. These days, the increased enthusiasm for pro-environmental policies may not necessarily be mirrored in government and citizen actions because, while people believe in the values of ecology, they do not believe that conventional economic structures that could jeopardize existing economic progress should be disrupted to help save the environment. Importantly, as Cooter asserts, obeying a norm often imposes a direct cost in money, inconvenience, effort, risk, or lost opportunity. Thus, when environmental issues are posed to the poor in a developing economy like Nigeria, their judgments will largely have economic undertones. Hence, negative and unsustainable exploitative practices would be elevated in the absence of profound economic wellbeing.

That said, command-and-control will continue to be an important instrument in achieving minimum levels of environmental improvements. However, approaches relying on economic incentives can also be pivotal in reducing the conflict between environmental protection and economic development. If it is a strategy that advances the cause of a good environmental policy – through the implementation of a market-based instrument using incentives – then when employed, could induce proper environmental management practices in the minds of the individual.

Towards a Market-Based Approach

The concept of incentives has long been used by both the public and the private sectors to encourage behaviour change among targeted audiences. By realigning economic incentives with individual choice and behaviour rather than relying on mandatory behaviours backed by enforcements, they empower drivers and reduce barriers, increase net benefits by reducing compliance costs and increasing flexibility in achieving environmental goals and facilitate technology innovation. Incentive-based approaches also can address small sources of pollution such as; households that are not easily controlled with traditional forms of regulation, as well as provide a reason for polluters to improve performance vis-a-vis to existing regulatory requirements. As developing countries begin to deal with large-scale environmental problems, the resources at their disposal are severely limited, thus, they have been repeatedly advised to consider and implement incentive-based regulations for managing the environment.

Since the reaction to environmental concern in Nigeria could be an attitudinal problem, and the approach to be followed that favours punishment, fines, and sanctions, may not lead to improved compliance since economic factors predominate the impact social norms have on an individual in a transition country. In furtherance to the discussion above, it is worth considering a system of economic incentive towards reducing the proliferation of the solid waste problems and litter. As much as incentives are not intended to replace traditional command and control regulations, but rather drive environmental performance, it has been pivotal in facilitating compliance where a culture of attention and responsibility for one's environmental sensibility does not currently exist. Although both the command-and-control approach and market-based instruments may function as stand-alone, albeit to varying degrees of effectiveness, their combinations could help achieve the desired results. While developed countries have relatively longer experience using this instrument (Panayotou), and developing countries' experiences more limited, one can tap from the experiences of the developed to assist a developing country like Nigeria to follow more promising routes of experimentation with this scheme.

Deposit Refund Scheme: An Overview

While the world is facing scarcity in natural resources, extinction of species, and several other dilemmas predicated on scarcity, there is an inordinate proliferation of solid waste and litter in Nigeria. Nigeria has an acute municipal waste problem per capita, with its per capita waste on the increase. World Bank predicts that the daily waste is expected to grow to 3.40 billion by 2050, while that of the low-income country will increase by more than three times. It is particularly dire in a country where self-littering of the environment has become a waste disposal habit among many Nigerians. Consumption patterns are changing and moving toward more packaged products and electronics. An increase in imports is also leading to larger amounts of packaging (World Bank). In Nigeria, littering appears to be a recurrent environmental pollution issue. It represents a sizeable contribution to environmental management problems in public spaces in urban high-density areas in Nigeria. It is an aspect of solid waste management that has become almost intractable to local authorities in Nigeria.

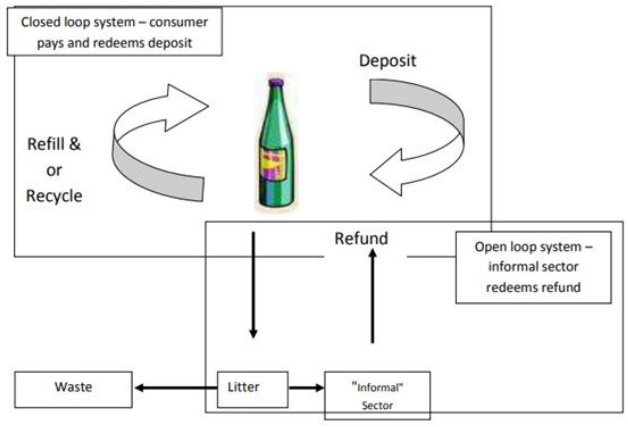
The increasing rate of litters, and waste management problems have become the public's nightmare in developing countries, with these challenges constantly upending their long-term developmental prospects. More particularly, in and around urban centres in the major cities, the eyesore that is created by various origins of litters has given members of the public a cause for concern, wherein Akpoghiran has identified self-littering of the environment as a common environmental practice and habit in Nigeria. As data suggests, the trend towards disposable litter will only increase, as the economy grows, and environmental problems continue to receive less attention from the government, relative to economic and developmental issues.

On this basis, we need appropriate tools and instruments to tackle this menace. When studying the approaches other countries took to successfully tackle litter problems, one prominent system was part of a market-based instrument, and one which has recorded some level of success has come to be known as a deposit-refund sys¬tem; it has been considered to

be an efficient means of increasing recycling rates and reducing litter. This system was initially used to tackle litter problems, but the strategy is now used with much more than just soft drink cans and bottles. A deposit refund system will provide a chance to minimize waste disposal, maximize recycling, and thereby increase the volume of waste that is being diverted from waste disposal and other waste management options. It provides an opportunity for people to return the empty containers while they are "on the move" and then recover the deposit by allowing them to deal responsibly with their waste. The two goals of litter reduction and increased recycling will also be reached.

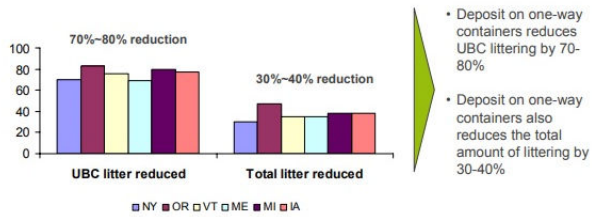
In its simplest form, a deposit-refund system combines a tax on product consumption with a rebate when the product or its packaging is returned for recycling or appropriate disposal. A refundable deposit is added to the cost of an item that has been considered to be a huge waste generator or pollutant. Once the item has been used and is returned to assigned places or locations for disposal or recycling, the consumer gets his deposit back, otherwise, it is forfeited. The refund value of the container provides a monetary incentive for customers to return the container for recycling. This mechanism for waste, litter, and pollution control has been implemented in several developed countries with success. Most notably, the USA, Canada, Australia, Finland, Sweden, Germany, South Korea, as well as developing countries such as India, China, Palau, Tunisia, Taiwan, etc.

Figure1: Illustrates the basic concept of the first beverage container deposit refund system in Oregon, USA



This system was first applied in the passage of the Oregon bottle bill of 1971 in the US, wherein there was a deposit imposed on all beer and soft drink containers which will be refunded upon a return of the container. Consequently, this idea has spread to other states in the US with California having the largest, and among the most comprehensive in the nation (R3 Consulting Group). Deposit-refund systems appear to be most appropriate for discrete, solid commodities such as beverage containers, batteries, and car bodies that would otherwise cause environmental harm through their improper disposal (National Center for Environmental Economics). Their implementation can be applied through two systems; it is either initiated by manufacturers through a voluntary system as can be seen on the deposit on most beer bottles in Canada or can be government-imposed deposits (R3 Consulting Group).

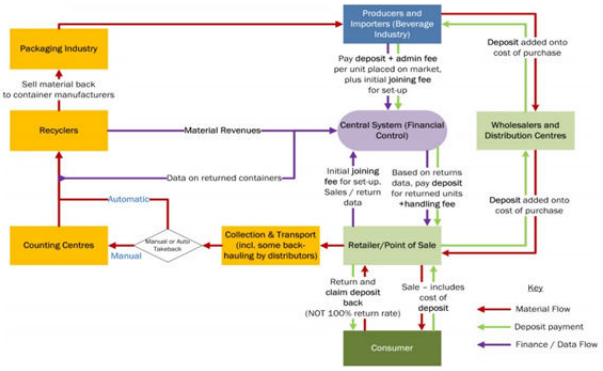
Figure2: showing evidence to suggest that there was a reduction in litters linked to the deposit return system implemented in the US



Several studies have concluded that deposit systems are more cost-effective than other methods of reducing waste disposal, such as traditional forms of regulations, recycling subsidies, or advance disposal fees (ADF) alone (National Center for Environmental Economics, 2001). Although high transaction cost (National Center for Environmental Economics), and relatively high administrative costs of a deposit system could outweigh these cost savings.

Considerations for a Deposit Refund System

figure3: Showing how the deposit refund model



If Nigeria is to set up an effective deposit refund system, it should be based on principles similar to systems existing in Denmark, other Scandinavian countries, and in some provinces in Canada. Since this system primarily involves incentivising people to appropriately dispose of their waste, and encourage recycling in the process, when designing a DRS to be modelled for the country, one needs to first decide on what product, or consumable should the deposit system be applied to. Based on similar trends in other countries, they usually apply this system to beverage containers made of metals, as well as glass beverage containers like beer bottles, wine bottles, soft drink bottles, etc. Most importantly, the modelled system should target non-refillable beverage containers to exploit the potential for increased recycling rates, lead to an increase in the quality of material collected for recycling through the deposit mechanism, and reduce litter levels.

Consequently, key stakeholders involved such as the manufacturers, retailers, collection companies, and consumers need to be incentivised appropriately for the system to be

effective. In addition, a collection point at major retail outlets that sell beverage containers could be encouraged so there are a sufficient number of places that can serve as return points for consumers, as well as remove the inconvenience of consumers having to travel to redemption centres to return containers.

Economic Applicability of Deposit Refund System to Nigeria

Figure 4: Illustrates the general material and financial flows in a deposit refund system

One of the crucial elements in the deposit model is the setting of the deposit itself. To make deposit refund systems effective, the amount of the required deposit is of primary importance because it has a huge impact on the percentages of return. Also, Oakdene Hollins reported that there are two styles of DRS. Those aimed at encouraging bottle refilling may require a large deposit to encourage a high container return rate of 90% or above because based on established studies, bottle refilling requires a return rate of approximately 90% to justify the costs of collection, sorting, washing, and checking. While those which are aimed at increasing recycling and reducing litter could require a smaller deposit and achieve a return rate of 65% to 70%. Meanwhile, incentivising with an amount that is seen as too small could be counter-intuitive and lead to the ineffectiveness of the system. As Environmental Resources Management (2008) argues, if the deposit level is too low, and the consumer is not sufficiently incentivized to return the empty beverage container, the return rate will be low, and the deposit system has in effect failed. Thus, the amount of deposits must be low enough to make refunds and reuse more economical to manufacturers than buying new containers.

The question which then presents itself is, how can one determine the optimum deposit amount to be levied on each beverage container in Nigeria to make them attractive enough to induce compliance, and achieve a high return rate? Although that may be difficult to determine due to several factors, many countries have attempted to use various techniques to arrive at the appropriate amount to be deposited. A study by the University of California at Berkeley (2003) used regression analysis to choose the best value of the deposit; one of the main focuses of their study was on the most efficacious way to maximise the recycling of containers in California. While Eunomia Research and Consulting (2012) when estimating the value of the deposit for Spain based on deposits and return rates from other systems around the world, plotted the return rate as a function of deposits across existing schemes and established that the return rates of 85% to 95% is possible, assuming the principal motive driving returns is an economic one. For Spain, they surmised that the potential financial impacts of applying different deposit values and the resultant return rates are valid, and concluded on the note that in setting a deposit of €0.20 per container, a high return rate can be achieved.

Consequently, it is valid to determine how a refund initiative could affect the disposal decision of Nigerian consumers based on the economic change in the value of products they consume habitually. On this basis, we follow the analysis and model presented by (Bohm): The consumer has two choices at the point of disposal; (1) whether, to dump the product or return it for a refund at the point of product disposal, and (2) whether, at each point in time, to keep the product or dispose of it. We look into the effects resulting from changes in the constraints on the consumer's refund use.

First, he may dump it at an imputed cost of Cd ≥ 0, or he may return it at a refund R(with no ties) and an imputed cost of CR ≥ 0. In principle, the latter decision is influenced by the choice of disposal alternative. It is assumed that:

Cd and CR – R are (made) known and are taken to be constant over time; thus regardless of the exact date when disposal occurs, it is known in advance which disposal alternative will be used, depending on whether Cd exceeds or falls short of CR – R.

The consumer will eventually stop using the product, and dispose of it: formally, we assume that the consumer in period t has a net benefit, v(t) – Cu(t), from using the product, known to be non increasing over time; v(t) is the gross benefit from using the particular item in period t, and Cu(t) are the cost attached to usage or nondisposal, such as storage, of the product in that period. (if v(t) – Cu(t) is constant, it is assumed to be only so for a finite number of periods.

Now, the consumer in the situation presented here will eventually return the product or the refund eligible part of the product if CR – R < Cd that is if the net return costs fall short of costs of dumping. And he will do so today (t) if it does not pay him to keep the product, that is, if the net benefit value or net use-value, v(t) – Cu(t) falls short of the gain from disposing of the product in this period of instead of waiting one more period. In order words, he will return the product at time t if:

v(t) – Cu(t) < – min (Cd, CR – R) + 1/(1+rc) min (Cd, CR – R) = -rc/(1+rc) min (Cd, CR – R)

whenever R – CR > – Cd. Here, rc is the consumer's rate of discount for returning the product in the next period.

In summary, a refund offer will affect the disposal behaviour of an individual if the offer reduces the net disposal cost for the consumer.

Criticism of the Deposit Refund Systems

One factor that could limit the widespread use of deposit refund systems is their high cost of implementation, administrative cost (National Center for Environmental Economics) amongst others. In terms of administrative cost, cogently argued that there could be significant administrative costs associated with refunding deposits, which could reduce the efficiency of the approach. To remedy this conundrum, they suggested that the cost could be passed on to the producers/ manufacturers rather than to final consumers. Subsequently, in one study that looked at the general applicability of economic instruments in the field of waste management by Great Britain. Dept. of Trade & Industry, deposit refunds scored poorly in that they were not considered applicable to the bulk of waste being managed.

All in all, most studies have heralded the benefits of a deposit refund mechanism. Although it may not be a panacea to all environmental concerns that have to do with solid waste management, the underlying advocacy surrounding it is the economic efficiency that comes with the increase in recycling rates. It has a generally supportive view in that it reduces the extent of littering, incorporates the habit of recycling, poses as an economic advantage for countries with limited enforcement capabilities, and fosters economic and environmental benefits to the participating individual, and the country at large.

Conclusion

There is no denying that developing countries lack a mature institutional base for environmental management, thereby making the adoption of the aforementioned difficult to administer and implement. What's more, policy directions such as the above may not necessarily be an economic priority due to the more cogent problems beleaguering their societies, thus environmental management problems with litters may continue to receive less attention relative to other development and economic issues. With limited resources, however, this event should present an opportunity for them to find a synergy between the environment, and developmental concerns, which can address the issues of poverty, and environmental deterioration simultaneously.

Whilst regulations through command-and-control approach continue to be an important driver, using incentives should not be seen as trying to replace traditional approaches to environmental management, rather complement existing regulations to encourage the public to improve their awareness of environmental degradation through littering, and bridge the constraints on administrative and political infrastructures that exist in many developing countries like Nigeria. There isn't a one-size-fits-all. Therefore, if a deposit refund system has been chosen as a scheme, this approach should be applied strategically, and tailored to the local environment.

Herein lies an opportunity for developing countries to deal with their solid waste management problems by designing regulations that harness the market to change polluting behaviours. This issue as foretold above is accomplished through market mechanisms such as DRS to create incentives for actions of the public that imposes great harm to the environment. The trajectory of environmental regulations, while still slow and reactive, will continue to face a host of challenges. The lack of environmental responsibility will remain potent, and enduring in the face of increased consumption. Environmental attitudes will continue to be abysmal at best as the average Nigerian struggles for economic visibility. All these notwithstanding, there has never been a need for economic and environmental agendas to be harmonized; one that takes a practical and balanced approach whilst recognizing the constraints that governments and societies face (World Bank, 1997). Further debate and analysis of the issue of solid waste is encouraged to have a rounded knowledge on the subject matter, and proffer solutions on the applicability of market-based instruments to environmental problems caused by solid waste litters in Nigeria.

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