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ENVIRONMENTAL FEDERALISM, DEPOSIT-REFUND SYSTEM ACCOUNTABILITY AND SUSTAINABLE ECONOMIC MANAGEMENT IN NIGERIA

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Abstract

In recent years, there have been debates over whether economic instruments for controlling pollution or managing the environment should be implemented at the local, state or federal level—a term known as environmental federalism. Although this term has received widespread attention across the globe, the literature runs the gamut of opinions on it. The diversity of opinions reflects how different countries have resolved the issue differently. Scholars in Nigeria have advocated the use of a deposit-refund system as one of the market-based tools for achieving sustainable economic management and development in the country. However, no single paper was found to have examined environmental federalism in relation to a specific economic instrument. Most papers discuss environmental federalism in general, without relating it to a particular environmental regulation instrument. This paper therefore analyses environmental federalism vis-à-vis the deposit-refund system—a mechanism that makes polluters accountable for their polluting activities. It reviews the relevant Nigerian laws and policies on environment, provides an overview of the practice of environmental federalism in Nigeria, and then explores the need for the decentralisation of policy decisions on environmental issues. The paper recommends that, for the country to foster sustainable economic management, deposit-refund system be implemented at the state level.

Keywords: Environmental federalism, economic instruments, deposit-refund system, economic management.

1. Introduction

The term *environmental federalism*, also known as the *principle of subsidiarity* or *aversion to the one-size-fits-all* approach, refers to the vertical devolution or distribution of functions and responsibilities relating to environmental protection among the three tiers of government— federal, state and local governments). It is an important question of the locus of regulatory authority that would be in charge of an environmental policy instrument. The fundamental question is, should a central environmental regulatory authority be the regulatory agency that would be uniformly implementing and enforcing the policy instrument, or should state or local environmental agencies be the regulators that would implement the policy based on their own jurisdictions? Which jurisdiction can most effectively address the environmental problem? Which approach is more promising, centralised decision making or environmental federalism?

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Arguments on whether economic instrument should be implemented at the local, state or federal level abound. Some scholars such as Babatunde and Biala, 2010; Patrick, Obasi, Okoroigwe, & Dibia, 2013; Biala & Aregbeyen 2018 have recommended deposit-refund system as the veritable and sustainable solution to waste management problems in the country. However, no single paper has examined environmental federalism vis-à-vis a specific economic instrument. Most papers on the topic usually discuss environmental federalism in general, without relating it to a particular environmental regulation instrument. This paper therefore examines environmental federalism within the context of deposit-refund system. Deposit-refund system (DRS) is an economic instrument for correcting littering or pollution. The objectives of this paper are to single out deposit-refund system as a case instrument and present it vis-à-vis environmental federalism, and to suggest the appropriate locus of environmental regulatory authority.

Having provided the introductory section, the rest of this paper consists of five sections. Section 2 provides an overview of the environmental regulations and the level of environmental federalism in the country. While two main principles of environmental accountability are examined in Section 3 in relation to economic instruments for protecting the environment, Section 4 reviews the deposit-refund theory. Section 5 discusses environmental federalism in relation to deposit-refund system. Discussion and concluding remarks are contained in Section 6.

2. Environmental Regulations and Environmental Federalism in Nigeria[1]

This section reviews various environmental regulations in Nigeria and compares the role of federal, state and local authorities in formulating environmental regulations.

Available evidence suggests that the evolution of environmental regulation in Nigeria dates back to 1914 when the Minerals Ordinance was enacted by the colonial administration. The main objective of the ordinance was to prohibit the pollution of watercourses in the process of mining and prospecting for any mineral resources (Orubu, et al., 2004). Some years after independence, several efforts were made towards environmental protection. These efforts led to, inter alia, the enactment of the Mineral Oils (Safety) Regulations (1963), Petroleum Regulation (1967), Oil Navigable Waters Act (1968), the Petroleum Act (1969), Harmful Waste Decree (1988), Effluent Limitations Regulations (1991), the Pollution Abatement in Industries and Facilities Generating Wastes (1991), and the Environmental Impact Assessment Act (1992). The Petroleum Act stipulated that oil firms should take precaution and control to prevent the pollution of inland waters and rivers watercourses by oil spillage and/or other fluids or substances that might contaminate the water.

In November 1988, Harmful Waste Decree (decree 42 of 1988) was promulgated following the discovery of the dumping of toxic waste by an Italian firm in 1987 in Koko, a seaport near Warri, Delta State. The country was before this incident ill-equipped to manage such environmental crisis, as there were no institutional capacity and legislations to address such matters. The decree adopted

[1] This section draws from Biala (2007)

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direct regulation approach and prohibited the sale, purchase, importation, transportation and storage of harmful waste in the country. In the decree, life imprisonment was prescribed as the sanction for any violators of its provisions.

Barely a month later, another decree (Decree No.48 of 1988) establishing Federal Environmental Protection Agency (FEPA) was prompted by the environmental crisis. The decree was promulgated precisely on the 30th December 1988 to further address the problem of environmental degradation. As stipulated in the decree, while an individual violator, on conviction, is liable to a fine not exceeding ₦20, 000 or to serve a jail term not exceeding two years or both, a corporate body found liable would pay a fine of ₦500,000 or less and pay compensation commensurate with the breach thereof and restoration of the polluted area to an acceptable level as approved by the agency. Most state governments later took a leaf from the federal government's book and established their respective state environmental protection agencies, such as Kwara State Environmental Protection Agency (KWEPA), Lagos Environmental Protection Agency (LASEPA), etc.

FEPA came up with guidelines and standards for environmental pollution control (FEPA, 1991). The guidelines and standards relate to five areas of environmental pollution control: (1) effects limitations, (2) water quality for industrial water uses at point of intake, (3) industrial emissions limitations, (4) management of social and hazardous wastes, and (5) pollution abatement in industries. A major effort initiated by FEPA to tackle the problem of solid waste management was a blue print on National Waste Management Strategy, anchored on waste minimisation, recycling, waste-to-wealth campaign; guidelines for sorting, collection, treatment, transportation, and disposal of waste; penalties for contravention of waste management laws, collection of fines, and disbursement of incentives to state and local governments for effective implementation (Umoh, 1997).

In June 1999, FEPA was transformed into the Federal Ministry of Environment and its state counterparts were consequently transformed into state ministries of environment. The Ministry incorporates other relevant agencies and departments in other ministries that are involved in environmental protection activities. The Ministry of Environment was created without an appropriate enabling law on enforcement issues, the situation created a vacuum in the effective enforcement of environmental laws, standards, and regulations in the country. Consequently, the Federal Government in line with section 20 of the 1999 Constitution established the National Environmental Standards and Regulations Enforcement Agency (NESREA) in 2007 as a parastatal of the Federal Ministry of Environment, Housing and Urban Development. NESREA is currently the institutional mechanism for environmental protection and sustainable development in the country. Established by NESREA Act No. 25 of 2007, the agency is charged with the responsibility for the protection and development of the environment and related matters.

In Nigeria, the responsibility for environmental policy-making is to some extent divided or shared between the federal, state, and local governments. In some important areas, regulatory policy-making

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is more centralised. In the case of global climate change, regulatory policy-making is centralised. In the case of waste, regulatory policy-making is shared, but is primarily the responsibility of local governments. Although the constitutional responsibility of solid waste management rests on the local government councils, solid waste constitutes one of the most crucial health and environmental problems facing local, state and federal governments.

Beside the federal environment laws, states in Nigeria have various types of laws for the protection and preservation of the environment. States are permitted to enact laws under the concurrent and residual legislative lists, subject to federal law. The State Houses of Assembly have their respective legislation vis-à-vis environmental management, an example of which is the respective legislations establishing State Environmental Protection Agencies. Each state also has its own environmental sanitation law, which stipulates that a particular day, usually a Saturday in every month, be earmarked for general environmental sanitation in the state.

According to Ogbodo (2009), despite the wisdom of empowering the states to pass the necessary environmental laws, such exercise of state legislative power is greatly limited by the federal constitution in the following ways:

1. The constitution expressly claims supremacy over all authorities and persons under the federation and any inconsistent law shall be rendered void to the extent of the inconsistency.
2. The laws made by the National Assembly enjoy superiority over the laws made by the State Houses of Assembly. Consequently, the inconsistent law of the State Assemblies shall be rendered void to the extent of the inconsistency.
3. The legislative powers of the State House of Assembly are permanently barred from any item on the exclusive legislative list of the constitution.

Ogbodo adds that although the major environmental activities that warrant immediate and realistic legislative responses occur at the state level, the states suffer from constitutional constraints in their legislative competence.

Local governments in Nigeria are not left out of the environmental protection responsibility. Each of them has its own by-laws on environmental protection. Under the constitution, their legislative sphere is limited to only items on the residual legislative list. Although most of the polluting or environmentally damaging activities occur in the local government areas, the local governments equally suffer legislative constraints similar to those impacting states (Ogbodo, 2009).

3. The Environmental Accountability Principles

In combating pollution or environmental degradation, two principles that have equity undertones often evolve as to who should be held accountable for pollution or environmentally degrading activities. These accountability principles are the polluter-pays-principle and the user-pays-principle.

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The polluter-pays principle (PPP) is an environmental accountability principle which holds that polluters should be made responsible to bear the full external costs of their polluting or degrading activities. If the individual polluters pay for, or take into account, the degrading activities they create, costs (private and social) of production or consumption will be higher and so will the prices. Less output will be produced and consumed because of the higher prices and environmental degradations will thereby be reduced. The PPP maintains that the polluters pay a penalty for polluting the environment with their activities. This emanates from the basic theoretical result that the efficient solution to the problem of environmental degradation calls for polluting agents to face a cost at the margin for their polluting activities equal to the value of the damage they produce (Cropper and Oates,1992).

The user-pays principle states that the resource users should pay for the full-cost of using a resource and its related service, which includes the cost of losses for future generations. The cost of resource depletion should be borne by users. As a complementary principle or variation of the polluter-pays principle, it ensures that the user of a resource pays the full cost of supplying the resource, or that the users should share in the abatement costs. The user-pays principle calls upon the user of a natural resource to bear the cost of running down natural capital (Coffey and Newcombe, 2001). For example, the user-pays principle can be applied to consumers of public services involving collection and treatment of wastes.

Inefficiency, more technically known as *market failure,* usually results in environmental degradation. Thus finding an appropriate solution to an environmental problem stems from an understanding of how and why the market fails (Thomas & Callan, 2010). The environment is degraded, or the market fails, because of the divergence between private costs and social costs of production. Therefore, solutions to environmental degradation problems often require *internalisation* of, or accounting for, external costs in production and consumption decisions, which is achieved through the polluter-pays-principle.

Several measures for accounting for external costs of an activity have been suggested in the literature. Pigou (1920) advocates the use of taxes and subsidies (now known as *Pigouvian taxes* and *subsidies*) to close the gap between private and social costs arising from externalities. That is, government should impose a tax equal to the marginal external cost of the pollution generated by the product. Imposing a tax on pollution would equate net marginal private costs with net marginal social costs, and thus assures that market transactions lead to Pareto optimal outcomes (Andersen, 2001). When pollution is priced (i.e., taxed), the result will be a more optimal allocation of resources than when it is not priced.

Later on, a number of other accountability measures evolved, among which are deposit-refund systems, marketable disposal permits, virgin materials taxes, recycling subsidies, command and control (CAC) measures and suasive (information-based) instruments. All these measures, except CAC and suasive instruments, belong to a family of instruments called *market-based instruments*.

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Market-based instruments, or economic incentives more broadly, are instruments that use financial means or otherwise to motivate polluters to reduce pollution (that is, to change their behaviour indirectly). They are regulations that encourage behaviour through market signals rather than through direct instructions regarding pollution control levels or methods (Stavins, 2001). Any instrument that aims to induce a change in behaviour of economic agents by internalising environmental cost through a change in the incentive structure that these agents face qualifies as an economic instrument. Economic instruments harness the forces of the market to solve environmental problems by changing the prices that individuals and businesses face. They encourage pro-environmental behaviour through market signals rather than through explicit directives. These instruments, economic and otherwise, are reviewed in the next subsection.

Charge mechanisms are the economic measures of accounting for negative externalities, which work through the polluter-pays principle. Charges are based on the quantity and quality of the discharged pollutants or the damage caused. The classic remedy to externality problems under charge mechanisms was first suggested by Pigou (1920). Pigou (1920) advocated a tax, now called the Pigouvian tax, on each unit of a polluter's externality-generating output in an amount just equal to the marginal social cost or damage it inflicts at the efficient level of output. Until recently, the Pigouvian tax remains the standard solution most favoured by economists. It is one of several ways in which government can intervene when individuals acting on their own cannot attain an efficient solution. The tax raises the prices of output and reduces both the amounts of output produced and consumed, thereby eliminating the suboptimal overproduction and overconsumption brought about by externalities.

The tax, in effect, forces the polluters to take into account the social costs of their activities and induce them to produce the efficient level of output. Such costs should reflect damages to the environment and the administrative costs incurred by the regulators. Otherwise, the mechanism will not be economically efficient. However, it should be noted that the revenue generated from the tax is not necessarily meant for the compensation of the victims of the externality. The Pigouvian tax possesses an important asymmetry in a market sense: it is a charge to the polluter, but not a payment to the victim because compensation to the victim from the generated revenue is not necessary to achieve efficiency (Rosen, 1999). Cropper and Oates (1992: 680) note that:

> *Compensation of victims is not permissible (except through lump-sum transfer). Where victims have the opportunity to engage in defensive (or 'averting') activities to mitigate the effects of the pollution from which they suffer, compensation cannot be allowed. For if victims are compensated for the damage they suffer, they will no longer have the incentive to undertake efficient levels of defensive measures (e.g., to locate away from polluting factories or employ various sorts of cleansing devices).*

The issue of compensation of victims from pollution bears a resemblance with the moral hazard problem in insurance (Cropper & Oates, 1992). It should also be noted that taxes on externality-

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producing activities are not designed to eliminate externalities, they are simply meant to force the polluters to account for the full costs of their activities; "Even if it is assumed that a tax correctly measures all the damage done, the decision maker may find it advantageous to continue causing the damage" (Case, et al., 1999: 371).

While the Pigouvian tax generates revenue to the government, it also allows the market mechanism to decide how resources should best be allocated. However, it is confronted with the following practical problems:

- Measuring damage is difficult, if not impossible. For instance, the monetary value of damage to health and loss of life is very difficult to estimate. Hence, finding the correct optimal tax rate is extremely hard.
- It is also difficult to reduce damage to an efficient level. If we knew the optimal level, we could just tell the polluter to produce exactly that amount and not have to mess with the tax.
- The Pigouvian tax overlooks a particular contingency that can result in "over-correction".
- The costs of collecting the necessary information and supervision are prohibitively high.

Due to these problems, numerous variants of charge mechanisms have evolved. These variants include emission/pollution charges, product charges, advance disposal fees (ADF), user charges, tax differentiation, and virgin materials charges. While user-fees, also known as user charges, are paid for the disposal of waste or pollutants, product taxes or charges are added to the prices of products that create pollution either through their manufacture, consumption or disposal. Since raising pure emission charges is not always feasible in municipal solid waste management, an alternative is to charge the product that generates waste or levy user charges for the collection and treatment of the waste.

User charges are payments for the cost of collective services. They are primarily used as a financing device by local authorities for the collection and treatment of solid waste and sewage water. Although user-fees, product charges and taxes (or emission charges) are similar, a distinction is usually made between them. Taxes are purely revenue raising instruments, while fees and charges are cost-offsetting instruments used by the government to finance costs of collective collection and treatment services. Examples of user fees are pay-as-you-throw system such as per-bag fees, unit-based scheme, volume-based pricing and weight-based pricing on solid waste disposal. Fees and charges require that the polluter pay a fee or a charge for each unit of pollution. They are incentives for the polluter to reduce pollution because they represent an explicit cost to the polluting activity.

Emission charges are levied directly on the quantity of pollution. If, however, it is difficult to measure or monitor the quantity of pollution, a charge, called a product charge, is levied on the product that causes the pollution. Product charges can be levied on products as they are manufactured, consumed or disposed of. One disadvantage of fees is that they do not guarantee the amount by which a polluter would reduce pollution. Fees and charges are widely collected at all levels of government. Despite

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the fact that they tend to be set at rates too low to have a significant impact on pollution, fees and charges can generate substantial revenues for the government. However, if they were set at rates equal to the marginal damage being caused by the pollution, or at a level that would force changes in business or personal behaviour, they would be controversial.

4. Deposit-Refund System

Just like other economic instruments, deposit-refund scheme is based on the polluter-pays-principles (PPP) and on the principle that incentives should be provided to encourage waste recovery, reclamation, and recycling. A deposit-refund system is a market-based method of controlling litter in which the buyers or consumers of a litter-generating product pay a surcharge, which is later refunded to them when they return the used packaging of the product, or its residue, to a point of purchase or a designated collection site. A DRS is a way of fully internalising the externalities of littering (Bohm, 1981). It combines a tax on the purchase of a product with a subsidy or a rebate for returning the used product or packaging to a designated collection centre. A DRS is a Pigouvian tax paid upon purchase but refunded on item not dumped, so the result can be equivalent to a tax on dumping or littering (Fullerton & Wolverton, 2000). Thus, Participating in a DRS implies recycling for cash payment.

The deposits levied on the polluting product represent a charge designed to cover the costs of waste disposal in the event that the used packaging or leftovers are not returned for recycling or safe disposal. But when they are returned to the designated collection points, the supplier gives either a total (or partial) refund of the initial deposit, depending on the cost of recovery or recycling of the material. The funds represent an effective subsidy to waste-recovery effort (Jerome, 2001). As long as consumers bear the cost of disposal, they have the additional incentive to return their used recyclable products to collection centres. By doing so, they avoid disposal costs and reap financial reward for supplying a product someone wants. Scavenging and returning used water-sachets provides a significant source of income for people, especially the homeless.

The per-unit deposit raises the price paid at the time of purchase, but for every container returned to the designated site, the recycler (the person that turns in the container for recycling) is paid the deposit amount. The container can be returned by anyone and need not be returned by the original purchaser. Someone else, especially the scavengers, can collect the containers and return them for cash. This leeway, known as *hustling*, no doubt contributes to the role played by DRSs in supplementing the income of the poor, and thereby decreases crime rates (Viscusi et al., 2009). Just like other economic instruments, the deposit-refund scheme is based on the polluter-pays-principles (PPP) and on the principle that incentives should be provided to encourage waste recovery, reclamation, and recycling.

DRS can be *voluntary* (market-initiated) or *mandatory* (government-imposed) (Bohm, 1981). While the market-initiated DRSs are developed by the private sector, mandatory or government-imposed

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DRSs are created by legislations. DRSs can be administered through the following methods (Morris et al., 2005):

i. *Retail Store/Traditional Method*. Here retail stores accept returned containers from consumers and refund their deposits. This method, currently used in Oregon and several other states, is also called the *return-to-retail* method or *return-in-store* method.

ii. *Redemption Centres*. Consumers redeem deposits at staffed redemption centres designated for the collection of containers. This method is used in California, Hawaii, Massachusetts, and Maine.

iii. *Third-Party Organisations (TPOs)*.The redemption is operated by third-party organisations on a commercial basis. The method is used in Canada and Europe.

The DRSs are an effective way of reducing litter, removing the cost of disposal from generated taxation and placing the costs on manufacturers, distributors and consumers. The objectives of DRS are to encourage proper disposal of waste products, to make used packaging available for reuse and recycling in order to curb litter-related pollution, and to divert recyclable items. Deposit-refund scheme is usually adopted for products which packaging materials are recyclable, costly to incinerate, generating large volume of waste, and occupying large space in landfills. It is also adopted for products which discrete packaging contains toxic substances, the control of which poses special problems to waste handlers and the improper disposal of which poses serious health hazards (Jerome, 2001; USEPA, 2001).

A DRS is called for when there is a potential for illegal dumping (Calcott & walls, 2000, Calcott & Walls, 2002; Dinan 1993, Fullerton & Kinnaman, 1995). A DRS is more effective in controlling litter because other charge mechanisms such as the Pigouvian tax encourage illegal waste disposal by individuals who try to avoid paying the tax or fee (Walls, 2011). A DRS, on the other hand, encourages proper disposal of waste by returning waste to a designated place. Several studies have argued that the DRS is the best option in the presence of illegal disposal (Dinan, 1993; Fullerton & Kinnaman, 1995) and that it can achieve the social optimum in this setting, efficiently controlling both legal and illegal waste disposal (Walls, 2011; Fullerton & Kinnaman 1995). Tietenberg and Lewis (2009) claim that DRS is more cost effective than any other measure.

The DRSs have the potential to effectively manage the quantity of litter-related pollution that is released from large numbers of small and dispersed sources of pollution (USEPA, 2001). The DRSs are most appropriate when the objective is to reduce littering externalities (Stavins, 1993). They are strongly advocated for products with very high costs of improper disposal, because the benefits derived from proper disposal are more likely to exceed the costs of waste separation and redemption (Stavins, 1993). For an effective and efficient DRS to exist, it is essential that a demand exists for the recycled products. Tietenberg and Lewis (2009) note that new markets may ultimately emerge, but the transition may prove somewhat turbulent. Simply returning used products to the collection centers accomplishes little if they are simply dumped into a nearby landfill or if the supply is

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increased so much by mandatory recycling laws that prices for recycled materials fall through the floor.

Both theoretical and empirical contributions have been made in the DRS literature on the magnitude of deposits and refunds and their equality. Tasaki et al. (2010) suggest that (1) the size of the deposit be determined so that it is equal to the marginal external cost of littering of the items covered by a DRS; (2) given the financial resources necessary for the collection and treatment of the items covered, it should be considered natural that the size of the deposit is higher than that of refund; and (3) in the case of valuables, it would be necessary to adjust the size of deposit and that of the handling fee for actors involved in the collection in order to minimize the overall social cost.

Economic theory suggests that the optimum deposit should be set at the point where the marginal social benefit is equal to the marginal social cost. However, some economists suggest that the magnitudes of the deposit and the refund need not be the same, though they often are. Fullerton and Wolverton (2000) contend that the deposit and refund do not necessarily need to equal each other, nor do they need to be placed on the same actors in the market place. For example, in the Calcott and Walls (2000) model, deposits are paid by producers to the authorities concerned, and the refunds are paid to recycling firms by the government; households at the downstream are not directly taxed or subsidized.

Nevertheless, it has been argued that deposit size should depend on the price of the item and its scrap value or value of its used packaging. Acuff and Kaffine (2001) argue that the deposit and refund need to vary by material because the level of emissions, pollution or litter varies by material. However, some surveys especially in Europe have generally shown that easier-to-return bottles far outrank higher deposits as the most important factor determining consumers' willingness to return empties (Porter, 1983). According to Porter (1983), deposit size seems to have little effect on return rate or effectiveness of DRS. The author argues that the real reason why return rates rise, is that the number, knowledge, and convenience of container return centres make returning containers profitable to consumers, even when the recaptured deposit is small. However large the size of deposit, of course, there would be some unclaimed deposits generated from those who would ignore the scheme and thus choose to litter. Some or all of these unclaimed deposits might be used to subsidize collection facilities, manufacturers or vendors of products that are subject to deposits for additional costs incurred in handling returned packaging; though these costs are also often partially offset by the interest earned on deposits and sales of the packaging collected (USEPA, 2001).

However, Grau (1997) suggests the size of the deposit should be large enough to give the required incentive but not so large that it encourages fraud and stealing. Schwartz and Pratt (1990) argue that an individual disposal decision depends on the size of refund and the cost of alternative disposal methods, such as illegal dumping; and that an effective refund should be large enough to encourage waste generators to adopt DRS. Calcott and Walls (2000) show that with two different rates for the

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deposit, one that applies to recyclables and one that applies to non-recyclables, the higher deposit/refund yields the constrained optimum.

Despite the plethora of research extolling the virtues of DRS in theory, its real-world application has not caught on. USEPA (2001) posits that one factor that limits the widespread of DRSs is their transaction costs: collecting and refunding deposits on the sale of individual products tends to be expensive. That is, additional costs are involved in collecting and returning used products. Nonetheless, Numata (2006) attributes the gap between the theory and practice to the negative impacts of the introduction of the system on suppliers of DRS products. These negative effects include (1) decrease in sales due to price increase brought about by adding deposits to prices, (2) huge initial costs of establishing the collection system, and (3) increase in collecting cost. Having pointed out these effects, the author then suggests two measures for mitigating the negative impacts on suppliers: (1) letting the suppliers keep unredeemed deposits as profits, and (2) paying handling commissions from a government to suppliers in proportion to the volume collected. Another shortcoming of this mechanism is that, it engenders interjurisdictional emissions leakage from regions where the DRS is not implemented. The regions or states with DRSs may incur the extra expense of illegal returns or fraudulent redemption from non-DRS regions (Kulshreshtha & Sarangi, 2001; Tietenberg & Lewis, 2009).

5. Environmental Federalism vis-à-vis Deposit-Refund System

The fundamental question is, should a central environmental regulatory authority be the regulatory agency that would be uniformly implementing and enforcing the deposit-refund policy, or should state or local environmental agencies be the regulators that would implement the policy based on their own jurisdictions? Which jurisdiction can most effectively address the attendant environmental problems?

Environmental federalism provides an answer to these questions based on the economic principles of costs and benefits. It suggests environmental federalism as the optimal regulatory system since the benefits and costs of reduced levels of most forms of pollution are likely to vary across different jurisdictions (Cropper & Oates, 1992). For example, Grau (1997) argues that a DRS need not be implemented federally, that the system can be regulated at a local, state or federal level, and that the deposit and the refund should be fixed according to geographical differences in per capita income and other social characteristic. The author adds that each jurisdiction should design the programme most suitable to its needs and select the most appropriate deposits and refunds, for the first-best outcome is one in which deposits and refunds are set in accordance with local circumstances. Oates and Portney (2001) argue that the responsibility should be placed with the smallest jurisdiction that spatially encompasses the lion's share of the benefit and cost.

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However, Cumberland (1981) objects this general presumption[2]. He argues that state or local officials, in their eagerness to attract new businesses in order to encourage economic growth tend to set excessively lax environmental policy standards. This would exacerbate the problem, and result in a race to the bottom with excessive environmental degradation (Oates & Portney 2001). There are some environmental problems in which a centralized decision making is required. Such cases include spatial externalities or regional/global pollution problem, where polluting activities in one jurisdiction impose damage elsewhere. Stavins (2001) notes that a nationwide approach may be appropriate for some products if (1) firms face national markets and products are easily transportable, (2) toxicity problems associated with improper disposal do not vary greatly by geographical area, and (3) the national approach is likely to be less costly for manufacturers and recyclers than a diversity of state or local programmes.

Nevertheless, Revesz (2001) challenges the influential claim that primary responsibility for environmental regulation should be assigned to the federal government because public choice pathologies cause systematic underrepresentation of environmental interests at the state level relative to business interests. The author also disagrees with the theoretical argument by the advocates of centralized regulation that environmental groups are less disadvantaged at the federal level because of economies of scale in organization. The author then mustered empirical data to challenge the view that states are ineffective environmental regulators. He contends that before the era of extensive federal involvement in environmental regulation, which began in 1970, states had in fact made great successes vis-à-vis those air pollution problems that were reasonably well understood. He also challenges the validity of the race-to-the-bottom rationale as an across-the-board argument for federal intervention. He, however, admits that there are compelling reasons for federal environmental regulation in certain contexts.

However, Goulder and Parry (2008) point out two important issues associated with environmental problems that are addressed by several different jurisdictions and multiple levels of government. One is policy linkage and the other is emissions leakage. "If political constraints force environmental policies to be made by governments whose jurisdictions are narrower than what efficiency would recommend, the situation can be improved through linkages across the 'local' programs". The authors define as "increases in emissions outside of a given jurisdiction that offset the reductions promoted within the jurisdiction". According to the authors, emissions leakage can occur in two ways. First, new policy instrument within a given jurisdiction can raise production costs and thereby force polluters to relocate to another. This implies increased emissions outside the jurisdiction implementing the instrument. Second, new policy instrument implemented by one jurisdiction is likely to shift consumer demands away from higher priced goods produced within the implementing jurisdiction to regions that are not implementing the environmental policy, thereby leading to increased demands and emissions in the latter jurisdictions.

[2]As cited in Cropper and Oates (1992)

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6. Discussion and Conclusion

The literature reviewed shows that the decentralisation of responsibility among the three tiers of government vis-à-vis environmental decision making has received widespread acceptance. Environmental federalism is highly contentious term in both theory and practice. In practice, environmental decisions regarding waste management has often been decentralised, and hence the common terms like municipal solid waste management, state environmental protection agencies, local waste management boards/councils, etc. The degree of decentralisation of environmental management differs significantly for various environmental problems. The case for centralisation relies heavily on the adverse effects of interjurisdictional competition and emissions leakage (where emissions cross jurisdictional boundaries), while the case for environmental devolution relies on the cost-benefit principle.

Although federal action may be justified when the effects of pollution are felt across (state) boundaries, the case in which both the costs and benefits of reduced pollution would accrue within a state's boundaries may more appropriately be addressed by state than by the federal government (USEPA, 1991). However, some environmental problems may be localized in their effects, and hence, may not justify federal action. Federal involvement may also be called for where a desirable policy can be implemented more effectively or less expensively at the federal than at the state level (USEPA, 1991). Even if federal involvement is not justified, the federal government may play a variety of roles vis-à-vis the policy instruments. The federal government can encourage policy intervention by state and local governments by providing information on effective policies or by offering grants for state programme development, without imposing any requirements for states to adopt specific programmes.

The literature reveals that there exists a strong case for localized environmental management where the costs and benefits of environmental protection are themselves localized. Anecdotal evidence also indicates that DRSs are often implemented at the state level rather than at the federal level. I therefore suggest that DRS be implemented at the state level. In practice, environmental decisions regarding waste management has often been decentralised and hence the common terms like Municipal Solid Waste Management, State Environmental Protection Agencies, Local Waste Management Board/Councils, etc. Although solid waste management is a statutory function of the local governments, state and federal government interventions have become necessary due to the fact that the local governments are not properly, technically and financially equipped to perform the function effectively and efficiently.

The final submission here is that for the country to foster sustainable economic management, deposit-refund system should be implemented at the state level. While making the litterbugs account for their littering behaviour and provide employment opportunities for people via recycling, scavenging for "valuable" litter items, etc., the DRS would enable the state governments to free up resources for

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other projects that are for necessary for economic development. This would engender sustainable economic management, growth and development of the country.

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